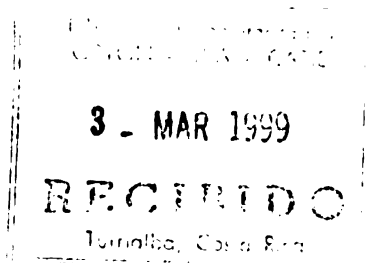


ATLANTIC ZONE PROGRAMME

**Report No. 57
Working Document No.23**



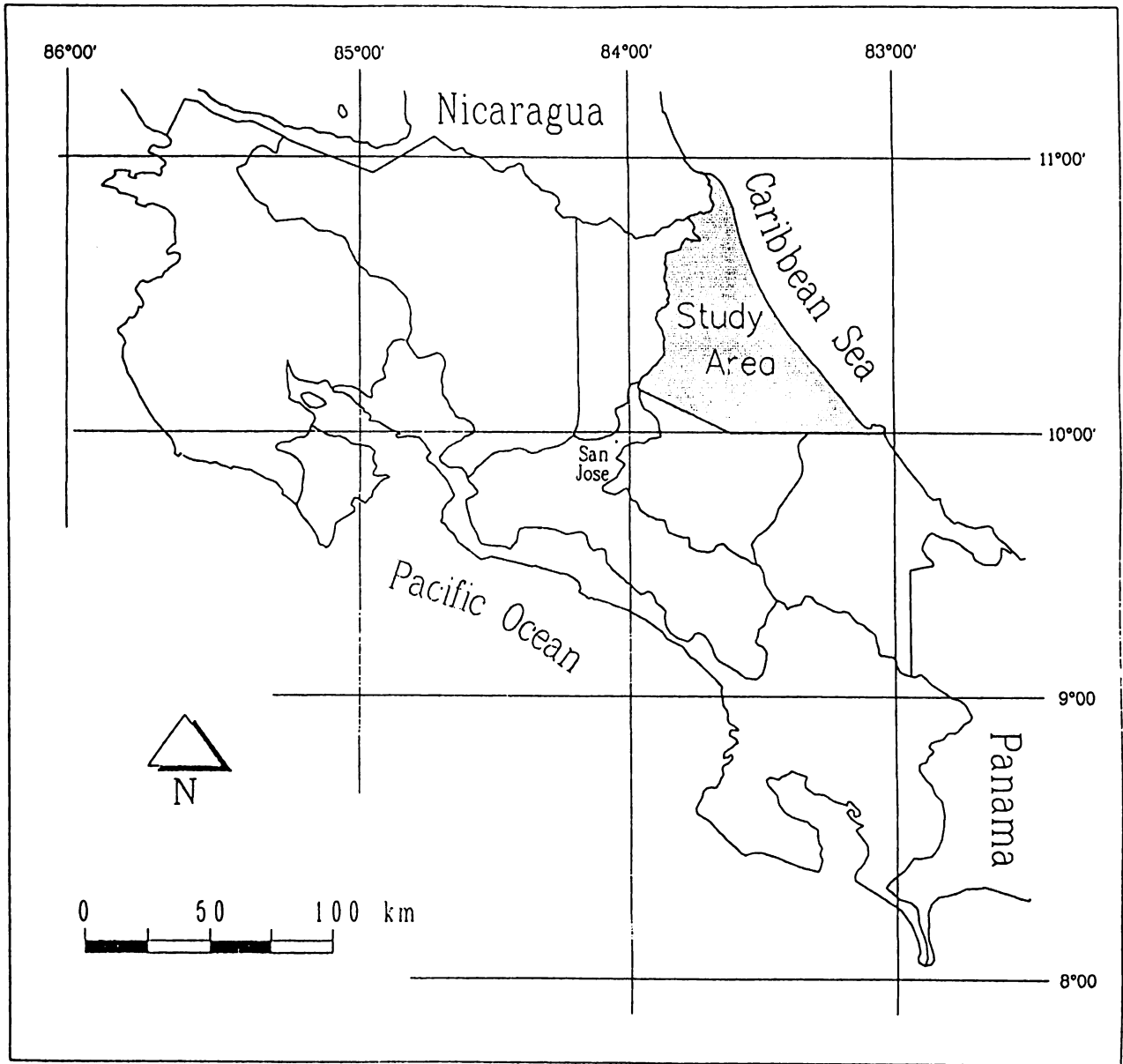
ANNUAL REPORT FOR THE YEAR 1992

**July 1993
Turrialba**

**CENTRO AGRONOMOICO TROPICAL DE
INVESTIGACION Y ENSEÑANZA - CATIE**

**UNIVERSIDAD AGRICOLA DE
WAGENINGEN - UAW**

**MINISTERIO DE AGRICULTURA Y
GANADERIA DE COSTA RICA - MAG**



PREFACE

General description of the research programme on sustainable Landuse.

The research programme is based on the document "elaboration of the VF research programme in Costa Rica" prepared by the Working Group Costa Rica (WCR) in 1990. The document can be summarized as follows:

To develop a methodology to analyze ecologically sustainable and economically feasible land use, three hierarchical levels of analysis can be distinguished.

1. The Land Use System (LUS) analyses the relations between soil type and crops as well as technology and yield.
2. The Farm System (FS) analyses the decisions made at the farm household regarding the generation of income and on farm activities.
3. The Regional System (RS) analyses the agroecological and socio-economic boundary conditions and the incentives presented by development oriented activities.

Ecological aspects of the analysis comprise comparison of the effects of different crops and production techniques on the soil as ecological resource. For this comparison the chemical and physical qualities of the soil are examined as well as the pollution by agrochemicals. Evaluation of the groundwater condition is included in the ecological approach. Criteria for sustainability have a relative character. The question of what is in time a more sustainable land use will be answered on the three different levels for three major soil groups and nine important land use types.

Combinations of crops and soils

	Maiz	Yuca	Platano	Piña	Palmito	Pasto	Forestal I II III
Soil I	x	x	x		x	x	x
Soil II						x	x
Soil III	x			x	x	x	x

As landuse is realized in the socio-economic context of the farm or region, feasibility criteria at corresponding levels are to be taken in consideration. MGP models on farm scale and regional scale are developed to evaluate the different ecological criteria in economical terms or visa-versa.

Different scenarios will be tested in close cooperation with the counter parts.

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 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.

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SUMMARY

The Annual Report of the year 1992 gives a brief summary of the Workplan 1991-1993 and explains the activities developed to during that year to reach the objectives of this programme.

1. INTRODUCTION

1.1 Programme background

This annual report discusses the progress made in the second phase of the Atlantic Zone Programme (PZA). The Atlantic Zone Programme is the main activity of the Support Station (Steunpunt) of the Agricultural University of Wageningen in Costa Rica.

The Second Phase of the programme started in 1991 and will continue till 1993. Similar to the first phases, between 1987 till 1990, the activities are realized within the framework of an agreement between the cooperating parties: Centro Agronómico Tropical de Investigación y Enseñanza (CATIE), the Ministry of Agriculture (MAG) and the Agricultural University of Wageningen (UAW). The agreement was signed in 1986 and forms the basis for AUW activities in Costa Rica.

Typical features of the area of Costa Rica in which the PZA activities take place comprise the following:

- A humid tropical climate with a rainfall surplus over evaporation of about 2500 mm, spread over all 12 months of the year.
- Soils of volcanic origin
- Recent and ongoing colonization and related rapid deforestation.
- Strong influence of (multi) national companies oriented towards export of bananas and other agricultural products.

The location of the study area is presented in Figure 1.

The central component of the programme in the Second Phase forms the research on:

A methodology for analysis and planning of sustainable land use, a case study in Costa Rica. The research programme was approved in Wageningen for 3 years financing (VF programme) and was agreed on by the cooperating parties in 1990. Apart from realizing the research programme the activities of the Support Station are oriented towards education and development.

1.2 OBJECTIVES OF THE SUPPORT STATION

- a) To execute a multidisciplinary research programme;
- b) To provide education for students from the Netherlands, Costa Rica and other countries;
- c) To disseminate research results to the broadest possible audience and support agricultural development activities in the study region.

On the basis of the approved research programme the following immediate objectives are formulated:

1.2.1. Research

- Development of a methodology for the analysis and planning of ecological and economical sustainable land use.
- Formulations of alternative scenarios for (sub) regions of the Atlantic Zone in Costa Rica.

Main tools of the methodology to be developed and tested are a combination of modelling, experimentation and multiple goal planning, resulting in alternative scenarios and computer generated thematic maps.

By its nature, this research implies a multi- and inter-disciplinary approach.

1.2.2. Education

- The research component will be supported by PhD and MSc studies, realized by students from the Netherlands (± 15 /year), from CATIE (± 5 year) and from Costa Rica (± 5 /year), using facilities of the research station Los Diamantes (MAG) in Guápiles and of CATIE in Turrialba. Furthermore, visiting staff members of the Wageningen University present specific courses and presentations related to the research programme.

1.2.3. Development support

- Working relations with development activities in the area are ensured by means of "letters of intent" and informal agreements with the participating agencies. A number of staff members of MAG and CATIE participate in research activities.

Working relations will not only be maintained with Costa Rican institutions, but also with some Agricultural Research Institutes in the Netherlands (DLO), engaged in the same problemacy (research programme on sustainable land use and food production DLV).

1.3 Target groups

As the research programme is oriented towards economically feasible and ecologically sustainable land use, both on small scale and larger regional scales, the audience that can make use of the results is found at corresponding levels.

- At the farm level the target group is found in individual farmers, entrepreneurs specialized in specific crops as well as farmers groups.
- At (sub) regional level the target group consists of national, regional and private organizations engaged in agricultural development.

Regarding the contract partners: CATIE has a shown interest in the multidisciplinary approach towards sustainability as it is also a main objective of its programme II. Specially regarding the integration of forestry systems in the farm operation and land use systems, a main research activity of CATIE, mutual participation is being developed.

Together with the research department of MAG expert systems are to be developed for a number of relevant crops. Existing knowledge at the research station "Los Diamantes" complemented with joint field research will provide the basis for this systems to be used by the extension service of MAG.

2. THE RESEARCH PROGRAMME:

2.1. General description

The research programme is based on the document "elaboration of the VF research programme in Costa Rica" prepared by the Working Group Costa Rica (WCR) in 1990. The document can be summarized as follows:

To develop a methodology to analyze sustainable and economically feasible land use, three hierarchical levels of analysis can be distinguished.

1. The Land Use System (LUS) analyses the relations between soil type and crops as well as technology and yield.
2. The Farm System (FS) analyses the decisions made at the farm household regarding the generation of income and on farm activities.
3. The Regional System (RS) analyses the agroecological and socio-economic boundary conditions and the incentives presented by development oriented activities.

To avoid confusion in the broadly used concept of sustainability, distinction is made in the programme between ecological and economical aspects of sustainability.

Ecological aspects of the analysis comprise comparison of the effects of different crops and production techniques on the soil as ecological resource. For this comparison the chemical and physical qualities of the soil are examined as well as the pollution by agrochemicals. Evaluation of the groundwater condition is included in the ecological approach.

By introducing crop simulation models the durability in time for crops-soils relations can be evaluated for different technology levels. Criteria for sustainability have a relative character. The question of what is in time a more sustainable land use will be answered on the three different levels. In this criteria, aspects of trend are evaluated by means of crop simulation procedures for three major soil groups and 9 land use types (Figure 2).

Figure 2 Combinations of crops and soils

	Maíz	Yuca	Plátano	Piña	Palmito	Pasto	Forestal		
							I	II	III
Soil I	x	x	x		x	x			x
Soil II						x			x
Soil III	x			x	x	x			x

As landuse is realized in the socio-economic context of the farm or region, feasibility criteria at corresponding levels are to be taken in consideration. Linear programming models on farm scale and regional scale are to be developed to evaluate the different ecological criteria in economical terms or visa-versa. Different scenarios will be tested in close cooperation with the counter parts.

2.2 Time schedule of the research programme

In Figure 3a an overall time schedule of the research programme is presented. Figures 3b, c and d show the planning of activities at the three levels of analysis.

Figure 3a. Time schedule (general)
Phase II Atlantic Zone Programme

Time base	Over all	Cases			MGP	GIS
		LUS	FS	RS		
1991/5	Workplan Formulation	Formulate forestry contribution				
7		Farm monitoring Rio Jimenez				
9	Formation	Formulate marketing contribution				Introduction
11	Scenario group				DLV* input planning	Siesta in C.R.
1992/1		First model run LUS				Test run available data
3		Farm monitoring forestry			first run	Regional
5	Testing first draft senarios	Cut off farm monitoring Neguev; Rio Jimenez				Test run Neguev Rio Jimenez
7		First run expert systems				Test run other areas
9		First run forestry systems				
11	Second draft senarios	Conslusion field work, reporting			Second run	Users guide GIS/Siesta
1993/1		Invitation workshop Final senarios			Third run	
3						
5						
7	Participation Symposium Neth. (Methodology)					
9						
11	Workshop reporting				Presentation case studies	

1994

- * LUS = Land Use System
- FS = Farm System
- RS = Regional System
- MGP = Multiple Goal Programming
- GIS = Geographic Information System
- DLV = Research programme on sustainable land use and food production (Netherlands)

Figure 3b. Time schedule soil-plant group I (LUS)
 (---|---|---) connection points for MGP see 3a)

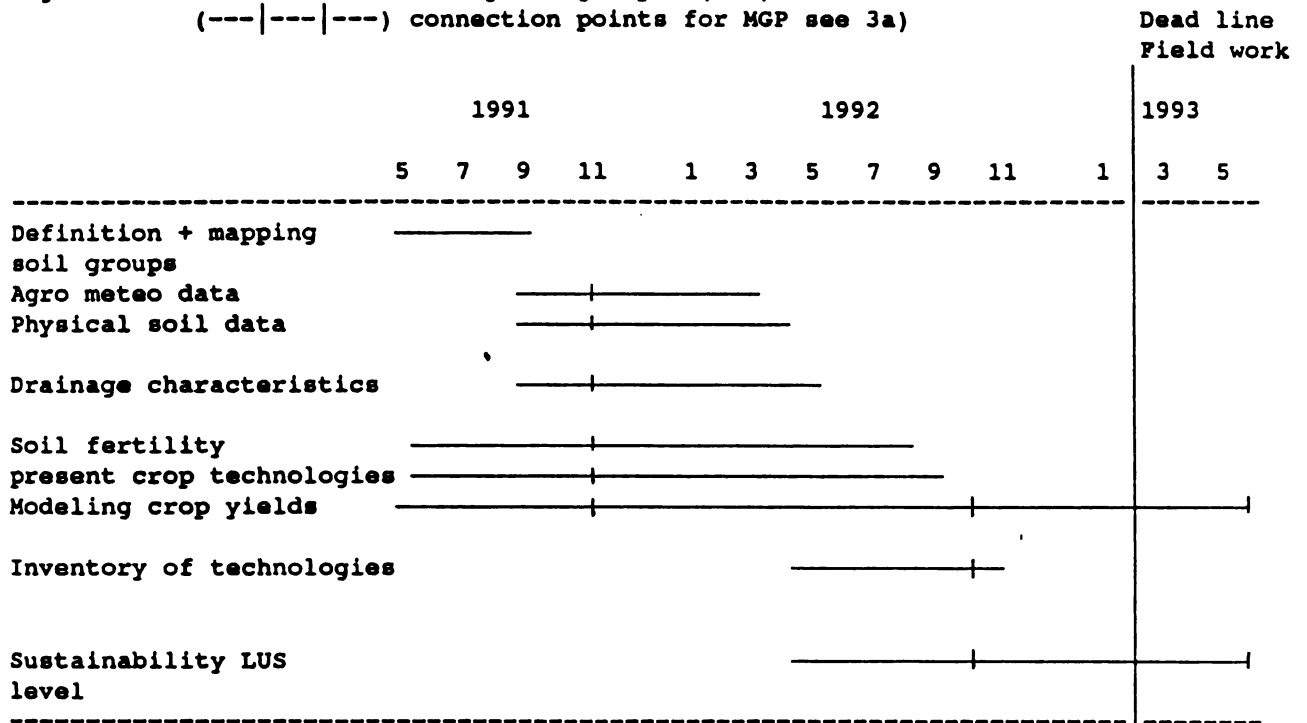


Figure 3c. Time schedule Farm - Systems. Group II (F.S)

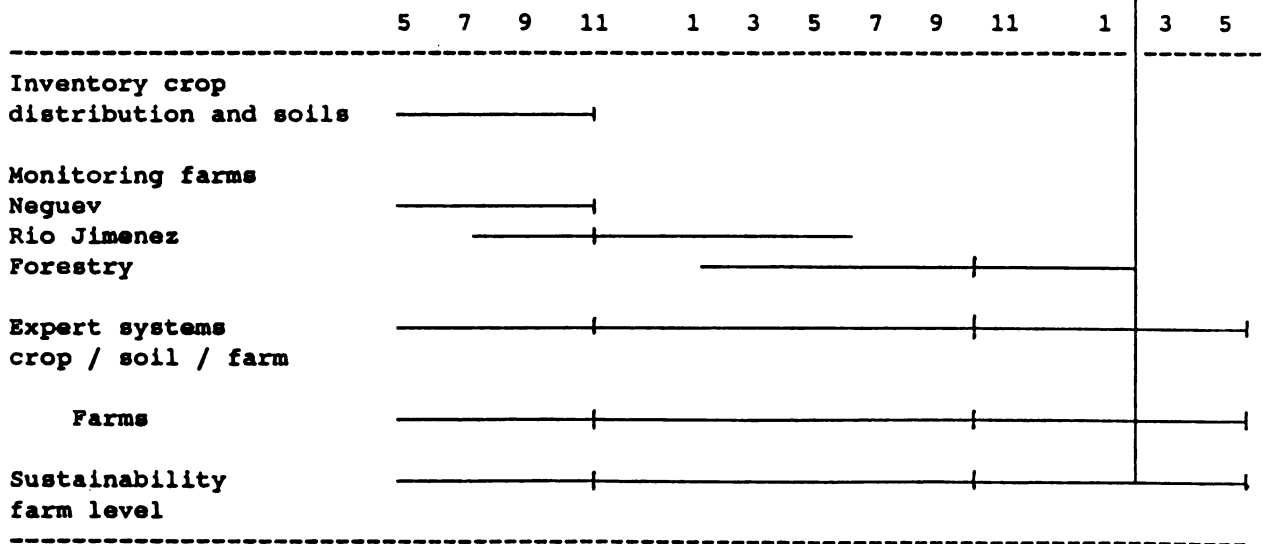
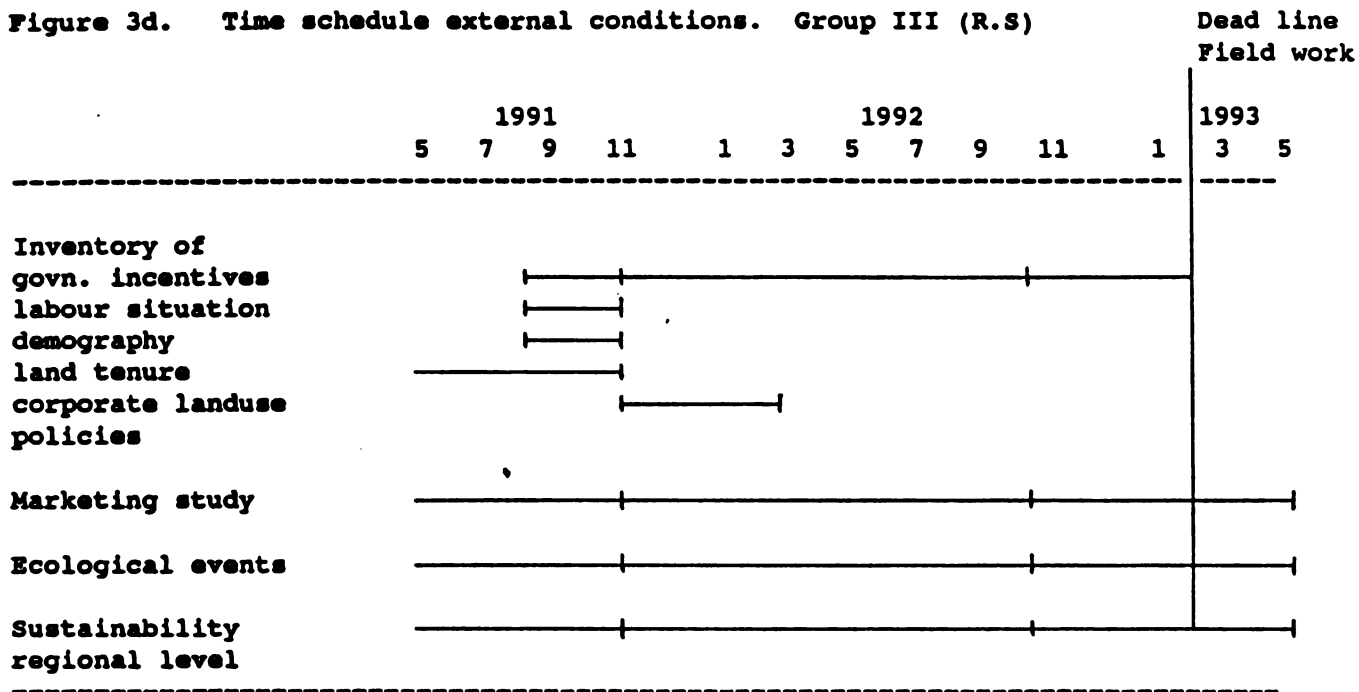


Figure 3d. Time schedule external conditions. Group III (R.S)



3. RESEARCH ACTIVITIES 1992

3.1 Research

In 1992 realized research activities will be discussed briefly in the same order as presented in the time schedule (3a - d).

3.1.1 General time schedule

Activities on the case study areas Neguev, Río Jiménez and Cocorf as well as the GIS activities proceeded according to the plan. The arrival of Arthur van Leeuwen (Forester) and Jetse Stoorvogel (GIS) ensured the progress in these components.

The scenario group, formed in the first months of the year, was suspended later because integrating of the case studies into a regional system became problematic. The input of the DLV groupe, foreseen for 1991, was further delayed and no man power was available to develop a methodology and the implementation. Development of regional scenarios was postponed to 1993.

An other drawback was that with the reorganization of CATIE, José Arze, who worked on the expert systems, was transferred from a Research Department to become Sub Director of Education. Possibilities to cooperate in the PZA became very limited, and no good replacement could be found.

3.1.2 Activities in Group I: Plant-Soil research (schedule 3b)

- Definition + mapping of soil groups

This activity on regional and subregional level (Neguev) was completed in 1991. A publication on the information on soil types and how the classification system can be used is beeing prepared by Wielemakers.

- Agrometeo data

Information of 7 meteo stations with observation periods of 10 or more years was collected. To allow analysis, the mostly written information had to be digitalized. This was a considerable job for which 2 assistants were contracted.

Don Jansen worked on the data analysis for use in crop growing models and other applications.

- Physical soil data

For the three soil groups information was completed interpretation and application will take place in crop grow models in 1993. Activities were supervised by Jetse Stoorvogel.

- Drainage characteristics

An experiment was set up to measure ground water behaviour in a transect of 2 km between two natural drains, in the soil group II (poorly drained). Interpretation of results showed that on larger field units, heterogeneity of texture is considerably (ocurrence of sand, clay and compacted layers within a few hundred meters) and modeling of a water balance can only be succesfull at small units.

Ground water studies continued in reasonable homogeneous areas and appear consistent for interpretation.

In the soil group III, old eroded lands of poor fertility, run-off and erosion measurement are being realized and will continue in 1993 (cooperation with FAO project on erosion). Drainage studies are supervised by Robert Sevenhuysen.

- Soil fertility

Fertilizer experiments on pasture were realized on three locations. For this work Carlos Aragón was contracted. The experiments on palmito continued coordinated by Don Jansen.

- Present crop technologies

With the arrival of Arthur van Leeuwen the three Land Use Systems in the forestry component (sylvopastoral, plantations and natural forest) were studied by means of inventory surveys and case studies. This activity made good progress in 1992. Actual pineapple technologies at farm level were analysed by Leendert den Daas MSc student from Wageningen.

The study on factors that influence plantain growth was realized by Osvaldo Torres, Costa Rican MSc graduate from the LUW. Work on occurrence and measures to control Black Sigatoka continued in collaboration with CATIE and CORBANA. Don Jansen offered support to activities in Plátano and Pineapple.

3.1.3 Activities in Group II: Farm system research (schedule 3c)

- Inventory of crop distribution and soils

In the sample areas Neguev and Río Jiménez this activity was concluded in 1991. Cocori was studied in 1992 in relation with the forestry inventory of Arthur van Leeuwen.

- Monitoring of farms

In 1992 monitoring on farm households in all three sample areas was almost concluded. In 1993 only bi-weekly visiting on cattle farms in Cocori will continue.

Guillermo Valverde is active in the farm surveys and was guided by Rob Schipper during his regular visits.

- LP Farms

A first schematic linear programming model based on a few LUST descriptions (Land Use Systems and Technologies), farm surveys and GIS Information was tested in 1992. (For Neguev only)

Although the used data set was rather limited the integration of different models appeared to function. Rob Schipper, Don Jansen and Jetse Stoorvogel were engaged in this first run.

- Sustainability at farm level

Rodrigo Alfaro concluded in 1992 his base line survey in the settlement scheme of Agrimaga. Two students of UNA assisted him in this work. A typology of farmers and farming activities were made that formed the basis for case study work (continues in 1993). Rodrigo Alfaro was also active in preparing a first draft of a parallel programme for applied research (see 3.3.3).

3.1.4 Group III: The Regional System (schedule 3d)

- Inventory of Government Incentives

The cooperation with the IUCN (International Union for the Conservation of Nature) diminished in 1992 as their project of the bufferzone development around the Tortuguero National Park ended and funds for a second phase were not (yet) approved.

In 1993 this study will continue and also other incentives (Governmental and Non Governmental) will be studied in relation with regional scenarios development. This activity will be realized in cooperation with DLV.

- Labour situation and demography

During the farm surveys it became clear that the banana plantations have a strong pull effect on the labour market. Many farmers (about 50%) work on the plantations. This labour opportunities create also an ongoing flow of immigrants to the Atlantic Zone.

Demographic development was studied in relation with the expansion of banana plantations during the last decades. Migration was calculated on the basis of national population growth and census data of 64, 74 and 84.

Jobs are also rapidly developing in the service and construction sectors of the region, making the Atlantic Zone less rural and increasing the regional market for farm products.

Jetse Stoorvogel and Rob Schipper supervised the studie of Rosanna Lok. (short term contract)

Land Tenure and Agricultural Credit

- In 1992 Willemien Brooymans concluded her field work for her PhD study on Land tenure. An inventory of (formal) agricultural credit started 1992, taking into consideration land tenure situations. The study on credit will continue in 1993 in cooperation with DLV.

- Marketing study

A study of the market structure for a large number of crops and products, of the Atlantic Zone was realized by John Belt (short contract) and 4 MSc students from the LUW. The foreseen cooperation with the UNA did not work out as planned since the UNA appeared more interested in participating in a marketing organization for tuber crops than in a broader study as envisaged by the PZA. This difference in objective; applied research versus systematic research impedes cooperation also in several other fields.

A publication regarding the marketing situation is under preparation by John Belt and Aad van Tilburg.

- Ecological events

The study on the effects of ecologic events like floods, earthquakes and vulcanic eruptions, initiated in 1991, in cooperation with UNA's department of Earth Sciences materialized in 1992.

Two UNA students supervised by Andre Nieuwenhuysen collected field information and historic information. A MSc thesis is in preparation.

Prof. Kroonenberg assisted in the study during his visits to the project and established support contacts with other geologic institutes in Costa Rica.

- Sustainability on Regional level

Analysis of ecologic sustainability at regional level started in November 1992 after the arrival of Jannete Bessembinder. First priority on her work schedule will be an inventory of the biocides used in the different crop production systems.

In 1993 emphasis will be on modeling of potential productions for some main crops grown in the region. Cooperation with DLV is anticipated.

- Geographic Information System

With the arrival of Jetse Stoorvogel, head way was made with the development of data bases that support the GIS system. Material was stored to enable overlays of a large number of maps including topography, soils, land use, demography, ecological events etc.

Together with Don Jansen, Jetse prepared a computer module that links LUST data with the LP model prepared by Rob Schipper (LUSTPZA).

By means of the combined programs GIS-LUST-LUSTPZA-LP-GIS scenarios are to be evaluated in 1993.

3.2 EDUCATION ACTIVITIES 1992

3.2.1 Regarding the educational objective, to provide guidance and support for student research, the following MSc students participated in the programme:

Edith Adames Feran	- (UNA, Costa Rica)
Olga Matamoros Vega	- (UNA, Costa Rica)
Francisco Fonseca	- (UNA, Costa Rica)
Lilliam Chávez	- (UNA, Costa Rica)
Alejandro Martínez	- (CATIE, Dominican Republic)
Erick Koster	- (LUW, Netherlands)
Alexandra Brouwershaven	- (LUW, Netherlands)
Francesca Erdelman	- (LUW, Netherlands)
Patricia Portier	- (LUW, Netherlands)
Philip Hulsebosch	- (LUW, Netherlands)
Jorg Tonjes	- (LUW, Netherlands)
Suzan Hoekstra	- (LUW, Netherlands)
Andre van Schaik	- (LUW, Netherlands)
Marjon van Logtestyn	- (LUW, Netherlands)
Harold Aalbers	- (LUW, Netherlands)
Randy Benjamins	- (LUW, Netherlands)
Jeroen van Alphen	- (LUW, Netherlands)
Joris Akkerman	- (LUW, Netherlands)
Pieter Paap	- (LUW, Netherlands)
Erik Schinkel	- (LUW, Netherlands)
Frans-Pieter Vonk	- (LUW, Netherlands)
Harold Leumens	- (LUW, Netherlands)
Sam Gerrits	- (LUW, Netherlands)
Leendert den Daas	- (LUW, Netherlands)
Jelger Vriend	- (Larenstein, Deventer)
Elco Gilijamse	- (Larenstein, Deventer)

3.2.2 PhD students in the Atlantic Zone Programme

Muhammed Ibrahim	- CATIE, Guyana/Pasture Improvement
Rodrigo Alfaro	- MAG, Costa Rica/Sociology
Ed Veldkamp	- LUW, Netherlands/Organic Matter
Wilhelmien Brooymans	- LUW, Netherlands/Land tenure
Arthur van Leeuwen	- LUW, Netherlands/Forestry
Janette Bessembinder	- LUW, Netherlands/Agronomy
André Nieuwenhuys	- LUW, Netherlands/Geology

Pieter de Vries defended in October his Thesis "Unruly clients" and obtained his PhD degree. The thesis was based on research done in the Atlantic Zone.

3.2.3. Staff members of CATIE: Participating in research and education

José Arze	- Expert Systems
Danilo Pezo	- Pasture improvement
Frank Romero	- Pasture improvement
Johny Montenegro	- Pasture improvement
José Galindo	- Crop protection
Cesar Sabogal	- Forest management

3.2.4 Visiting members of the Wageningen University on research support and project coordination:

Prof. Zadoks	Prof. Kroonenberg
Dr. Frinking	Prof. Fresco
Prof. t'Mannetje	Prof. Bouma
Ir. Schipper	Ir. Boerrigter
Ir. Neuteboom	Dr. Wielemaker
Ir. Konyon	Dr. Hendriks
Prof. Molenaar	Dr. Filius
Prof. Long	Ir. Staudt
Prof. van Bremen	Dr. Jongmans
Dr. van Tilburg	

The programme was also honored by the visit of Prof. van der Plas Rector of the Wageningen University, who participated also in the Conference on Integrated Rural Development. Ir. van Oort of INRA (France, Martinique) participated in the field visits with Prof. van Bremen and Jongmans.

3.3 Development oriented activities

3.3.1 Courses organized

For staff members of MAG (SENACSA) and MSc students of CATIE a course on Quantitative Land Evaluation was presented in January-February. The professor of the course was Nico Konijn of the Soils Department of the LUW.

A follow up course in Wageningen for two technicians from MAG was sponsored by the FAO (also given by Nico Konijn).

3.3.2 Conferences and other activities

Members of the team participated and assisted in the organization of the Conference on Integrated Rural Development organized by CATIE, Guelph (Canada) and the AUW, in Turrialba.

A workshop on pasture improvement, followed by a field day, was organized to introduce the results of Muhammed Ibrahim obtained in Legum-Grass mixtures. Some 100 farmers and technicians participated.

- Jetse Stoorvogel participated (July 26-29) in a conference in Cornell (USA) "Operational methods to characterize soil behavior in Space and Time", and presented a lecture on "Optimizing the distribution of land use to minimum nutrient depletion", a case study in the Atlantic Zone of Costa Rica.

-Rodrigo Alfaro participated in a conference in México regarding farm system development (June 22-26). His presentation was titled: "Estrategias adaptativas de los pequeños productores en la Zona Atlántica de Costa Rica".

Rodrigo Alfaro participated together with Salle Kroonenberg in a DGIS organized conference on research priorities for international development assistance, in Groningen, Netherlands. Together they presented "Research on Sustainable Land use a case study in Costa Rica".

3.3.3 Development oriented Parallel programme

During discussions with the Director of the Experimental Station "Los Diamantes", the host of our installations in Guápiles (office and dormitories) it became clear that results of AUW research offers only a limited contribution towards activities realized by the Experimental Station.

Translation of many of the developed insights of the programme in the field of agronomy and farming systems indeed need an additional step to make them applicable. The present cooperation, which includes PhD-research by one representative of MAG and several presentations in the form of small workshops and some field days, lacks the necessary continuity to enable use of the potential benefits. Together a programme was designed for applied research and rural development and discussed with the agricultural representative of the Dutch Embassy.

The preliminary proposal was well received and was further elaborated. An identification mission of DGIS can be expected in 1993.

3.3.4 Demonstration fields

In the mean time, results of the pasture improvement research, carried out by Muhammed Ibrahim under supervision of Prof. 't Mannetje, were considered direct applicable in demonstration fields at farm level. 3 KAP (small Embassy projects) projects were approved and financed by the Embassy.

Installation of the demonstration fields will be realized in 1993.

3.3.5 Cooperation with FAO/SENACSA

The course on Land use evaluation, given by Ir. Konijn in January-February was followed by monthly instruction in the set-up and use of a Geographic Information System. A course on Arc/Info 3.3.1 was given in March. Ir. J. Stoorvogel of the permanent staff of the field team, was instrumental to this training activity.

Together with technicians of the FAO/SENACSA team, four erosion plots were realized in the Neguev settlement (2 pasture, 1 palmito, 1 piña). The measurements will include run-off, erosion and nutrients losses. (continue in 1993)

3.4 Miscellaneous:

- A convenio was signed with the Department of Sensus and Statistics of the Ministry of Economics (Celade) to enable the use of data regarding house-hold consumption in Costa Rica of products grown in the Atlantic Zone.

- During the coordination mission of October/November a reconnaissance visit was undertaken to Guanacaste province, to evaluate field possibilities and meet with potential research partners for the follow up of the present VF programme. (see proposal VF programme Sluise)

- In 1992 a large number of video shots were taken to enable the production of educational and promotional films.

On the agricultural fair, in September, a first compilation of activities in the Atlantic Zone was presented. An instruction/promotion video was also made of the pasture improvement research that concluded in November.

- Under the enthusiastic leadership of Arthur van Leeuwen a "permanent" football team of PZA was formed and frequent matches were played in all settlements where the PZA is active, including with the bus drivers of Guápiles!

4. Organization, Infrastructure in Costa Rica, Publications

4.1 - Steering Committee

The research programme is supervised by the Steering Committee in which representatives of the research partners are meeting each other 2 times per year.

CATIE is represented by the Director of Programme II; MAG is represented by the Director of the Department of Investigations and LUW is represented by the chairman of the working group Costa Rica. (WCR).

4.2 - Field team

The programme is realized by the field staff. In 1991 the field staff comprised of four scientists from Wageningen; an administrative staff and a technical staff (14 members in 1992).

Field team members in 1992

- | | |
|-------------------------|--------------------------------|
| - Robert Sevenhuysen | - Coordinator |
| - Donatus Jansen | - Agronomist |
| - Jetse Stoorvogel | - G.I.S. expert |
| - Rob Schipper | - Economist (part time) |
| - Cristina von Marshall | - Secretary Turrialba (6 mths) |
| - Jasmín Ibrahim | - Secretary Turrialba (4 mths) |
| - Vicza Salazar | - Secretary Turrialba (2 mths) |
| - Miguel Astúa | - Driver |
| - Olga Carvajal | - Secretary Guápiles |
| - Fernando Cambronero | - Assistant Adm. Guápiles |
| - Luis Quirós | - Field assistant Guápiles |
| - Guillermo Valverde | - Field assistant Guápiles |
| - Celia Alfaro | - Maid |
| - Edgar Alfaro | - Guard |
| - Franklin Ugalde | - Guard |
| - Jorge Naranjo | - Guard |

It is the task of the field team to coordinate, support and participate in the research activities that are carried out by a number of PhD and MSc students from the Netherlands and Costa Rica (PhD students - 8; MSc students - 26 in 1992). The field team reports monthly to the WCR and the Steering Committee.

4.3 - Consultancy group

As advisors to the Steering Committee and the field team the LUW consultancy group (WCR) is engaged. The group consists of representatives of the LUW departments that participated in the research and a representative of the Foreign Office.

Members of the group visit the programme once or twice per year. (1992 - 24 visits, average stay 10 days)

4.4 - Temporary staff

For research activities in the programme for which no student are available contracts of short duration are awarded (12 contracts in 1992, average duration 5 mths).

4.5 - Facilities

The facilities of the field team consist of 4 offices at CATIE in Turrialba and offices, guest house, a laboratory and store house in Guápiles.

Most field research is carried out in farmers fields, some activities take place in the Experimental Station of Los Diamantes and in plantations.

4.6 - Publications

Apart from scientific publications prepared by the consultancy group and the PhD researchers all students prepare a report of their activities. A draft report is left on their departure and finalized at the University. For this purpose a serie "Sustainable Land Use" is maintained. In 1992 17 titles appeared (see annex 1).

In the serie the following types of reports are included:

- Field reports prepared by students;
- Work documents prepared by staff members, PhD researchers and consultants;
- Conference papers and presentations in workshops.

5. 5.1 Work budget of Support Station 1992

Item	Subject	1992
2241.3	Personel (Costa Rica)	155.000
2241.4	Travel expenses	8.000
2420.0	Office inventory	25.000
2430.0	Vehicles (1000)	10.000
2510.0	Office rent	33.000
2520.0	Office equipment	10.000
2530.0	Transport running cost	40.000
2540.0	Office running costs	20.000
2550.0	Research materials	20.000
2590.0	Other running costs (lab.)	60.000
2212.0	Ticket costs field team	10.000
2215.5	Travel expenses field team	10.000
2213.3	Ticket cost missions	50.000
2215.1	Travel expenses missions	35.000
2260.0	Work contracted out (CR)	35.000
2216.1	Printing costs (maps, reports)	20.000
2612.0	Ticket costs fellowships	6.000
2613.0	Travel costs fellowships	8.000
2650.0	Courses	15.000
		570.000

5.2 Total expenditures 1992 + short description

6. Perspectives for 1993

In 1993 the research programme will focus on the integration of results that can be presented in the conference "Future of the Land" in August and the workshop in November in CATIE.

To arrive at integration at regional level the input of DLV will be very usefull.

In case this can not he realized, more economic inputs are required. John Belt, who realized the marketing study was found interested to return to Costa Rica in February 1993 and fill in the gaps on regional information and get himself acquainted with linear programming of farm types outside the Neguev. Rob Schipper will support this input.

The question of how regional economic development can be related to subregional and farm level development in economic terms remains to be answered.

During a meeting with the new Director of CATIE, Dr. Rubén Guevara, the interest of CATIE in our programme was stressed and the following activities were requested to aim at:

- 1) Scientific course
- 2) An International Conference/Workshop on Sustainability
- 3) Development of a joint PhD programme.

The first two activities will be organized by the field team. The joint PhD programme will need structuring and agreement on an other level.

A new VF proposal for the period 1994-1998 will be developed by WCR in Wageningen.

During the field visit to Guanacaste valuable information was obtained from representatives of the UNA (Universidad Nacional) and from SENARA (Servicio Nacional de Aguas Subterráneas Riego y Avenamiento). With both organizations working relations will be established by the field team in order to arrive at cooperation structures for the next VF programme.

The field team will also promote and assist in the preparation of the parallel programme on applied research. Contacts with MAG and the Embassy will be strengthend for this reason.

ANNEX 1

NEW REPORTS PHASE 2

1. Work Plan 1991-1993 - A methodology for analysis and planning of sustainable land use, a case study in Costa Rica. Working Document #16
2. Practical technologies for the improvement of Pastures in Central America. (L.'t Mannetje). Conference Paper #1
3. Deforestation, Colonization and utilization of land resources in the Atlantic Zone of Costa Rica. (Fred R. van Sluys; Willem G. Wielemaker; Jan F. Wienk). Programme Paper #14
4. Soil hydraulic conductivity on two tropical soil types under forest and a 25 years old pasture. (G.J. Weerts) Field Report #69
5. Geomorphology and soils of the area Limón - Cahuita, Atlantic Zone of Costa Rica. (F. Luijckx; W. Zonnenberg) Field Report #73
6. Investigation about the farm activities of women and the importance of their activities for the family income in El Indio. (K. Hooijschuur). Field Report #71
7. Farm systems in the Neguev settlement. (J.M. Finnema). Field Report #72
8. Diagnóstico sobre el manejo del cultivo y compatibilidad del cacao en la Zona Atlántica de Costa Rica. (D. Cruz Choque; J. Morera; H. Waaijenberg; A. Paredes; P. Oñoro). Programme Paper #10
9. A study on the spatial distribution of land use in the settlement Neguev. (C.A. Mucher). Field Report #75
10. Pérdidas de cosecha del plátano; un estudio exploratorio en el Valle de Sixaola, Costa Rica. (A.T.M. Bouma; H. Waaijenberg). Working Document #15
11. Estudio detallado de suelos de la finca experimental Los Diamantes. (Luis Guillermo Valverde - Asesorado por Dr. Willem G. Wielemaker). Working Document #14
12. Estudio del posible riesgo de deslizamientos y procesos aliados en la cuenca del Río Toro Amarillo. (M.W.Hartman) Field Report #74

13. Intervenors intervened: Organizational predicaments and institutional contradictions in the production of export plantains in the Atlantic Zone of Costa Rica. (G. Verschoor). Field Report #88
- *14. Atlas of the Atlantic Zone. (J. Stoorvogel). Field Report #70
15. World food production through sustainable agriculture. (R. Rabbinge). Conference Paper #4.
16. Black sigatoka appearance in plantain in relation to disease control and farm management. (J. de Vriend) Field Report #94
17. Generación y aplicación de la información de suelos de la Zona Atlántica de Costa Rica. (Actas del Taller Información de Suelos. Guápiles - Exposiciones y Guía de Excursión. (W. Wielemaker, S.B. Kroonenberg) (ISBN 9977-57-124-4). Programme Paper #13
18. Orientation of cassava cuttings: the effect on root geometry and on the force needed for manual harvest. (H. Waainenberg). Field Report #70.
19. Production and partitioning of dry matter in eddoe (*Colocasia esculenta* var. *antiquorum*). (H. Waaijenberg, E. Aguilar). Field Report #68.
20. Simulation of potential growth of palmito of pejibaye (*Bactris gasipaes* H.B.K.). (D. Jansen). Conference Paper #3
21. Annual Report for the year 1991. Working Doc. #20
22. Un sistema de información de suelos y tierras para la Zona Atlántica de Costa Rica. (W. Wielemaker) Working Document #22.
23. Deforestation trends in the Atlantic Zone of Costa Rica: a case study. (E. Veldkamp; A.M. Weitz; I.G. Staritsky, E.J. Huising). Reprint Article 1
24. Soil physical properties of a fertile, poorly drained soil and their adequacy for use in quantified land evaluation. (S. Mantel). Field Report #110
25. Estudio Detallado de los suelos del Asentamiento Neguev. (Sytze de Bruin). Working Doc. #17
26. Quantification of farming systems in the Neguev Settlement. (P. v/d Berg; R. Drog). Field Report #76

27. Sistemas de producción bovina en la Zona Atlántica de Costa Rica con énfasis en los cantones de Pococí y Guácimo. (C.Aragón). Field Report #77
28. El cultivo de frijol tapado en Costa Rica
Un resumen de Investigaciones, 1978-1991. (R. Alfaro; H. Waaijenberg). (ISBN 997757-123-6). Working Doc. 18
29. Flujos de fondos entrados y de fondos saliendo relacionados con estado del suelo y con disponibilidad de crédito - Una investigación entre 30 fincas en el asentamiento Neguev, Zona Atlántica, Costa Rica. (Oskar E. Jansen; Dr. W. Wielemaker; D. J. Bouma). Field Report #78
30. El cultivo del pejibaye (*Bactris gasipaes*) Zona Atlántica de Costa Rica, 1988. (J.C.M. de Haan, H. Waaijenberg). (ISBN 9977-57-126-0). Serie Técnica. Informe Técnico #192. Report #30. Programme Paper #9.
31. Mineral transformation and clay neoformation in two profiles on an andesitic chronosequence under humid tropical conditions. (P. Verburg). Field Report #79
32. El enfoque de sistemas: algunos conceptos y aplicaciones en la zona Atlántica de Costa Rica. (Henk Waaijenberg). Conference Paper #2
33. Determination of losses of nutrients and nematicides on a banana plantation in the Atlantic Zone (A. Rosales, P. Maebe, R. Sevenhuysen). Field Report #80
34. Respuesta del pasto elefante enano (*Pennisetum purpureum* cv. Mott). A diferentes intensidades y frecuencias de pastoreo en el trópico húmedo (Guápiles) de Costa Rica. (A. Maas). Field Report #81
35. Demographic Profile of the Northern Part of the Atlantic Zone. (R. Lok). Field Report #82
36. Sistema de Información Técnica (SIT) Parte I y Parte II. (J. Arze Borda, L. Gómez). Field Report #83
37. Weathering of fluvial deposits containing material under humid tropical conditions. (F. van Ruitenbeek). Field Report #84
38. Estudio del uso de la tierra, suelos y paisajes de Nueva Guinea, Nicaragua. (E. Acuña, I. Rodríguez, W. Wielemaker). Working Document #19
39. Drainage observations in poorly drained soils in the Atlantic Zone. (P. Maebe). Field Report #85

40. Soil physical characterization of two soil types under four different land use forms in the Atlantic Zone of Costa Rica. (A.M. Weitz). Field Report #86
41. Establishment and adoption of Bracharia brizantha/ Arachis pintoi associations in the Atlantic Zone of Costa Rica. (A. van Schaik). Field Report #87
42. Sustainability. (M. Hulshof). Field Report #89
43. Análisis de inventario en una comunidad campesina de la Zona Atlántica de Costa Rica: El caso de Agrimaga. (R. Alfaro Monge). Field Report #90
44. Land use in Río Jiménez. Linked to soil types with the encuesta general and aerial photographs. (B. Veltman) Field Report #91
45. Selectividad de A. pintoi asociado con B. brizantha y B. humidicola por bovinos en pastoreo en condiciones del trópico húmedo. (A. Martínez, M. Ibrahim, D. Pezo y L. 't Mannelje). Field Report #92
46. Investigations in plantain. (E. Gilijamse). Field Report #93
 - 1) A study on the relation between Black Sigatoka severity and soil type
 - 2) A study on nutrient removal from the soil
47. A study on geomorphology, mineralogy and geochemistry of the Toro Amarillo-Tortuguero and the Chirripó-Matina river system in the Atlantic Zone of Costa Rica. (R.J.M. van Seeters). Field Report #95
48. Land use classification through overlay procedures. Research investigating the possibilities to classify land use by combining information from different thematic maps for the northern part of the Atlantic Zone of Costa Rica. (B.J. van Alphen, R.H. Benjamins). Field Report #111
49. Una caracterización de fincas en Neguev, Río Jiménez y Cocorí; Zona Atlántica, Costa Rica. (R. Schipper). Working Document #21.
50. The 'Why' of decisions taken by farmers in the Agrimaga settlement (J. Akkermans) Field Report #96
51. Producing pineapple in The Atlantic Zone of Costa Rica: Agronomic and Marketing aspects. (J.L. den Daas) Field Report #97

52. Farmers or Foresters. The use of trees in the sylvopastoral systems of the Atlantic Zone of Costa Rica (P.F. Paap) Field Report #98
53. Optimalisering van landgebruik naar meerdere doelen met behulp van interactieve meervoudige doelprogrammering Voor een Gebied, Gelegen in de districten Guápiles en Guacimo Zona Atlantica, Costa Rica een Testcase. (A.M. Bok). Field Report #99.
54. Plantation forestry in the Northern Atlantic Zone of Costa Rica. (A.S. van Brouwershaven). Field Report #100.
55. Actividades financiadas por los bancos estatales en la Zona Atlántica de Costa Rica. (C. Aragón). Field Report #101.
56. The soil use classes in relation to three forestry land use types: Natural forest, Agroforestry and Forest plantations. (H.F. Koster). Field Report #102.
- *57. Annual report for the year 1992. (Working Document #23)
58. An export marketing plan for exporters of roots and tubers, plantain and palmheart in the Atlantic Zone of Costa Rica. (S. Hoekstra). Field Report #103.
- *59. Intermediate trade in CATIE, fruits, roots and tuber in the Atlantic Zone of Costa Rica. (Marjon van Logtestijn) Field Report #104.
60. Palmito (*Bactris gasipaes* H.B.K.) growth and management in humid lowlands of the Atlantic Zone of Costa Rica. (Raymond E.E. Jongschaap). Field Report #107
61. A geological/geomorphological and soil transect study of the Chirripó massif and adjacent areas, Cordillera de Talamanca, Costa Rica. (J.G. van Uffelen). Field Report #108.
62. Andisol formation in a Holocene beach ridge plain under the humid tropical climate of the Atlantic coast of Costa Rica. (A. Nieuwenhuyse, A.G. Jongmans, N. van Breemen) Programme Paper #15.
63. Reservado para Carlos Aragón.
64. Exportaciones no tradicionales en Costa Rica y la Zona Atlántica. (A.D. Ramírez C.) Field Report #112
65. El crédito en Costa Rica: el caso de la zona atlántica. (A.D. Ramírez C.) Field Report #113
66. Matriz ganadería: Zona Atlántica Costarricense. (A.D. Ramírez C. y Carlos Aragón). Field Report #114

67. The variation of soil physical properties in fertile well-drained soils under banana. (H.J.L. Leummens).
Field Report #115
- *68. Plantain in the Atlantic Zone of Costa Rica: Management, Black Sigatoka and Nematodes. (O. Torres L. y D. Jansen).
Field Report #109.
69. Prácticas y recomendaciones sobre el uso de la tierra a nivel de finca. (Anónimo). Working Document #24.
70. Valuation of small farmers. (Bouma, M.B.; Linker, P.J.)
Field Report #116.
71. Reports of the Atlantic Zone Programme Phase 1 (1986-1990) Phase 2 (1991-1992). (M.G.H. Oostrom). Field Report #117.