

“THE ‘WHY’ OF DECISIONS TAKEN BY
FARMERS IN THE AGRIMAGA SETTLEMENT

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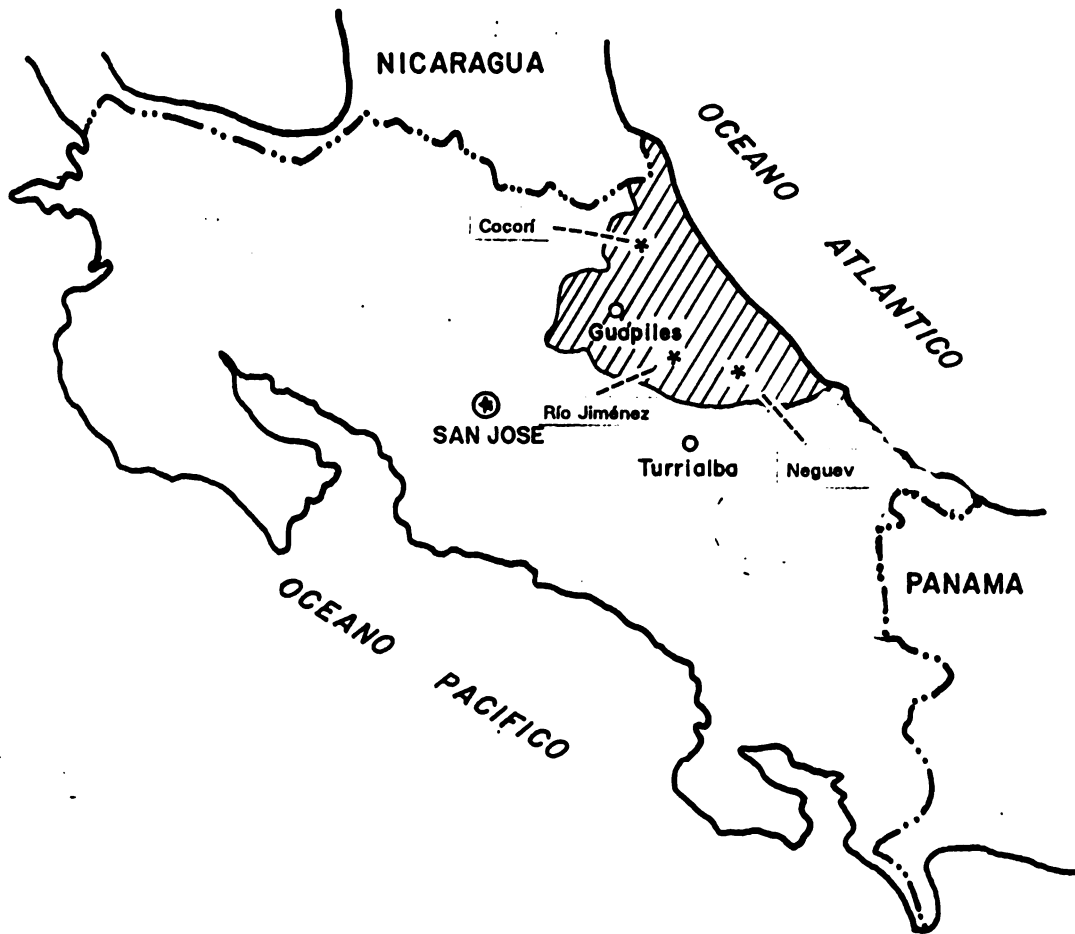


Figure 1. Location of the study area.

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.

CONTENT

1	INTRODUCTION	1
2	ORGANIZATIONAL SET UP	
	2.1 The objective in a wider context	2
	2.2 Used methodology and theory	2
3	THE RESEARCH AREA	
	3.1 The Atlantic Zone	5
	3.2 The Agrimaga settlement	5
4	THE EIGHT CASE-STUDY FARMS	
	4.1 Farm 1: Luis (maize)	6
	4.2 Farm 2: Oscar (chili)	8
	4.3 Farm 3: Nefti (maize)	10
	4.4 Farm 4: Marcos (maize)	11
	4.5 Farm 5: Adem (cassava)	13
	4.6 Farm 6: Rigi (cassava)	14
	4.7 Farm 7: Don (palmheart)	16
	4.8 Farm 8: Carlos (palmheart; cattle)	18
5	GENERAL FINDINGS ON THE EIGHT CASE-STUDY FARMS	
	5.1 Problems and possible solutions	21
	5.2 The future of the 'small farmer'	22
6	AN INITIATIVE TO A FARM CLASSIFICATION	
	6.1 Class one: Luis and Carlos	22
	6.2 Class two: Oscar and Marcos	23
	6.3 Class three: Don	23
7	CONCLUSIONS	24
8	REFERENCES	25
	ACKNOWLEDGEMENTS	25

MAPS

Map 3.1	The Atlantic Zone	4
Map 3.2	The Agrimaga settlement	4

APPENDICES

Appendix 1	Hypothetical typology of the farmers
Appendix 2	Product overview per farm (at present)

The report presented is the result of a study done within the context of the Atlantica Zone Programme (AZP), a cooperation between the Tropical Agronomic Research and Education Center (CATIE), the Department of Agriculture and Livestock (MAG) and the Wageningen Agricultural University WAU), within the scope of three months during a 'practical' period, to obtain work experience as a requirement for the MSc exam.

The case-studies reported are a sub-division of a social-economic study performed by R. Alfaro, researcher of the Programme. The study took place in a settlement called 'Agrimaga'.

The general objective of this study is to contribute to the understanding of the different ways in which the small farmers of the Atlantic Zone of Costa Rica develop their 'agricultural systems' or 'adaptation strategies' in relation to the use of their soils and the managing of their farms.

In this report special attention will be given to questions concerning the 'why' of production actions taken place on a farm.

This report contains eight chapters. Chapter 2 discusses the study in it's wider context and deals with the set-up of the research. Chapter 3 gives general descriptions of the research area. The following chapter, chapter 4 gives general information per farm and extensive information about the findings of each studied production process, per farm. Chapter 5 presents general findings about the eight case-study farms. Chapter 6 is an initiative to a farm classification and chapter 7 contains the conclusions of the report.

2.1 The objective in a wider context

As noted in the introduction the general objective of the project performed by R. Alfaro in cooperation with CATIE, MAG and WAU is to contribute to the understanding of the different ways in which the small farmers of the Atlantic Zone of Costa Rica develop their 'agricultural systems' or 'adaptation systems' in relation to the use of their soils and the management of their farms. The study's emphasis is on the knowledge of small farmers about the reality that surrounds them and how this determines their choices to adapt to this reality.

The project is composed of three stages. Firstly, an inventory analysis was made of a small community of small farmers, to obtain information about their productive resources and the different ways in which they are used. In addition a 'hypothetical typology' or 'social map' (appendix 1) was made of this agrarian society by means of qualitative and quantitative methodologies. The presented report is a part of the second stage, in which 8 farmers were selected on the basis of interesting and representative production activities. Of each farmer, a profound analysis is given on the production process of one or two products per farm. Also hypotheses are formulated to try to explain the rationality of these farmers in making decisions. The final stage will consist of an experiment, with the constructed hypotheses, through case-studies in similar small communities of 'small farmers' in the canton of Guacimo.

2.2 Used methodology and theory

The approach of living in the center of the Agrimaga settlement was chosen to construct an environment of trust and understanding with the small farmers. After a two-week period of getting acquainted with the eight farmers, their backgrounds and the spoken language, qualitative research on the selected products on the eight farms began. Helping the farmers in their daily agricultural work stimulated a basis for a relation of trust, and a better understanding of actions taken by farmers.

The two methods used in the case-studies were inquiry and observation. The inquiry had a semi-structural character. A guide was used for each part of the studied production process per farm¹ to maintain an orderly conversation, permitting to obtain

¹ The parts of the studied production process consist of: Soil preparation before sowing; The use of seeds; The sowing; Soil and plant maintenance; The harvest.

the desired information. Through observation the topics of the inquiry could be verified and questioned. To obtain a comprehension of 'the making of decisions on small farms', the emphasis was laid on the 'why' of decisions and taken actions. This can give information about, firstly, the specific problems, secondly, the production conditions that are the causes of these problems, and thirdly, the realized adaptations.

A useful way to comprehend the 'why' of production actions, is searching for discrepancies between four alternatives of action:

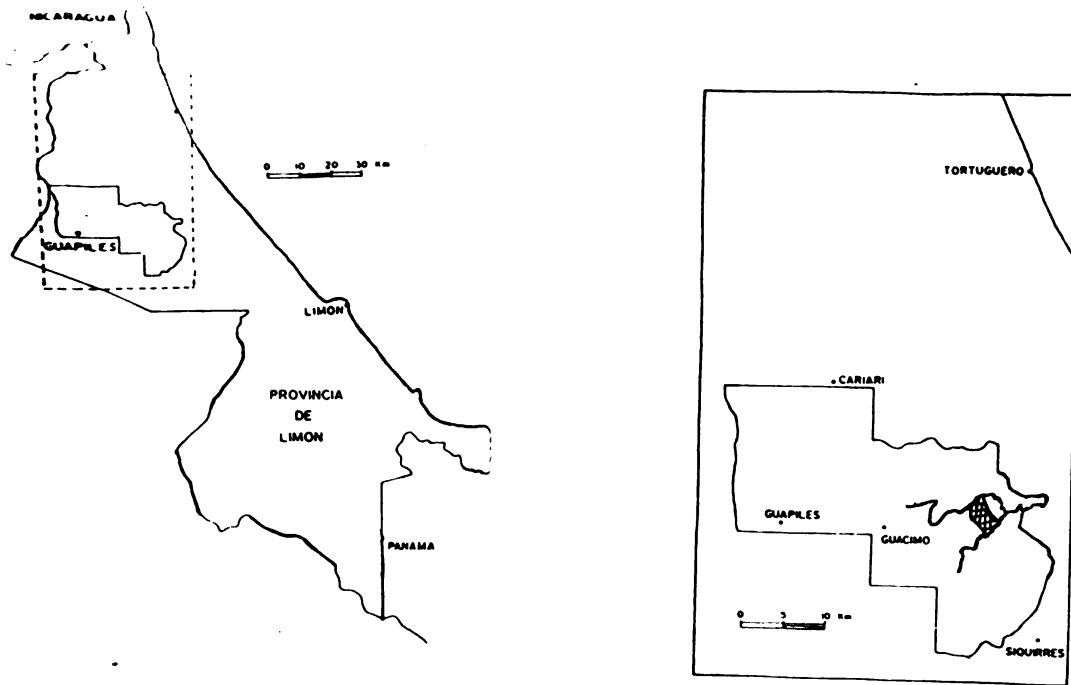
- 1) agricultural practice at present
- 2) preferred agricultural practice
- 3) agricultural practice recommended by the agronomists
- 4) agricultural practice in the past.

The discrepancies encountered between the four alternatives (noted in chapter 4), form the basis for a dialogue about the hypothesizes that can be conducted concerning the rationality of farmers in making decisions.

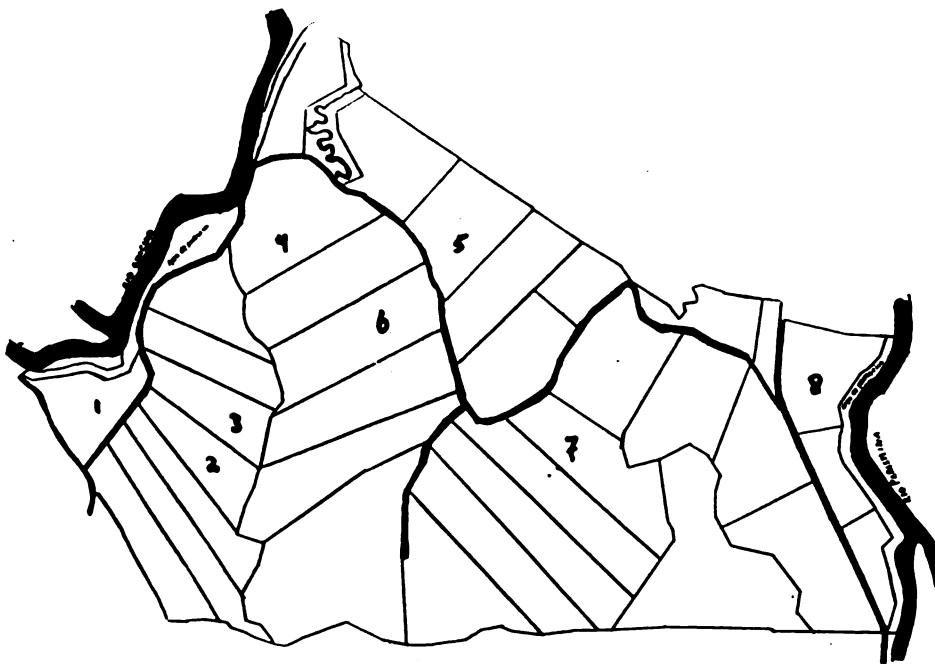
The 'why' of the discrepancies existing in the agricultural reality of a small farmer is indicated (see chapter 5) with three principal questions posed during the research on the eight farms:

- 1) What are the problems farmers have, in the Agrimaga settlement.
- 2) Which solutions are (should be) apt to solve these problems.
- 3) What will the future contain for the small farmer of the Agrimaga settlement.

Hereafter (chapter 6) an initiative to a farm classification is made with farm- and farmer-characteristics (encountered) which cause the different agricultural modes. This is done to state the importance of the farmer himself, in creating his agricultural mode.



Map 3.1 The Atlantic Zone of Costa Rica.



Map 3.2 The Agrimaga settlement, with farm plots

3.1 The Atlantic Zone

The Atlantic Zone of Costa Rica corresponds to the province of Limon, and exists of an area of 921,800 ha. It's an area with a large diversity of soils, fertile alluvial soils coincide with very poor soils. Some parts of the zone are still covered with rain forests, others have been used for agriculture for more than 80 years. The way the area is cultivated is also diverse. Large multinationals, banana plantations and big livestock farms exist next to small farms often with low inputs and a diversity of crops. The situation described above results in a complicated society. The IDA (Instituto de Desarrollo Agrario) has acquired 163,000 ha (17.5%) of land in the Limon province and settled at least 12,000 families in different settlement schemes. One of these schemes is the Agrimaga settlement.

3.2 The Agrimaga settlement

The Agrimaga settlement is located 10° 14' 58" northern latitude and 83° 38' 33" western longitude in the canton of Guácimo. The total area is 362.7 ha, divided into 32 farms. Seven ha is preserved as a forestall zone and 3.5 ha is destined for the instalment of communal buildings. Average rainfall throughout the year is 3,125 mm, with peaks in July and December and falls in February, March and April.

The farmers of Guacimo organized themselves into a union to obtain land of a big cattle farm which was confiscated by banks. They put pressure upon the IDA, which bought the land in 1985. In 1987 the land was divided between 32 members of the farmers union of Guácimo.

Nowadays a primary school is present and recently a little health center was built. Eleven farmers don't have electricity, but this problem will be dealt with at the end of 1993. The majority of the people lives in wooden houses and a running water system isn't available.

Of each case-study background information will be given, about reasons for being a farmer, reasons for present land use, and ideas of land-/ farm-use projected for the future. After this introduction, the schedule of the production process will be explained per farm for each studied product (economically the most important), what the problems are in these production processes, and what the reasons for undertaken actions are. Hereafter the discrepancies found will be noted and explained. All information given is obtained directly from the farmers. In Appendix 1 an overview is given of the products produced (in ha) per farm.

4.1 Farm 1: Luis

Grown up in an agricultural environment, Luis remains in this profession for a lack of education to do something else. He earns extra income with making coffee baskets (also a family tradition). He came to the Agrimaga settlement with the illusion that having land is the solution for surviving. But how and for what to use the land is of main importance. His six ha farm consists one of the best soils of the Agrimaga settlement. Nowadays he cultivates two crops, maize (4.5 ha) and chili (1 ha). He grows chili on contract with a factory which supplies his seeds, and buys his product (weekly guaranteed income).

In the future he wants to keep one ha with maize, and a part with chili picante when the market keeps well. And a lot of pineapple, for a cooperation between ten farmers and the 'Standard Fruit Company' is initiated. Besides he has got a good soil for pineapple according to the agronomists (having a natural drainage system and plowable soil). He believes, that when he keeps on working, his living conditions will improve bit by bit.

4.1.1 The product maize

1) Soil preparation before sowing: When the weeds are high (>0.5 m) he cuts them one month before sowing. After 15 days he applies a systemic herbicide (Roundup) to obtain a sowable terrain. Applying 'Roundup' less than eight days before sowing destroys the maize seeds. 'Roundup' works optimal when the weeds are dry, thus he applies it in full sun. Sometimes, when the weeds are very tough and high, he uses fire to obtain a terrain more easy to sow. But he doesn't prefer this for it destroys the weeds acting as a fertilizer. When the weeds are low he only applies 'Roundup' for then he doesn't have to apply too much of this expensive product, it doesn't affect his health and costs less time.

For a person without the money to prepare the soil with a plough

(being fast and better yielding) , this is the only method of soil preparation for sowing whatever product.

2) The use of seeds: Having experimented with a lot of varieties, he now uses 'Diamantes' for it produces the biggest maize-ears of good quality and the plants don't grow high. He tests the seeds by sowing ten, to adjust his seed quantity. He treats the seeds with an insecticide/nematicide (Carbuculpan) so they aren't eaten in the house or field.

3) The sowing: He uses a 50 cm inter-seed- and 90 cm between-row-distance, and alternates two seeds for three. With this sowing system he doesn't lose much productive area and there is enough space for a good development of all the plants. He used to sow 70 cm per one m, alternating three seeds for four. Though needing less fertilizer (also due to a more fertile soil), he lost producing terrain and also seeds because of too much competition in the holes.

4) Soil and plant maintenance: If it doesn't rain during the sowing he applies a fertilizer (Formula Completa "10"30"10), if it does, he avoids it being rinsed out by applying it 8 days after sowing when the plants are little. During sowing he also applies a poison for rats and insects (Counter). Two days after sowing he applies the herbicides 'Gramaxone' (burning the already growing weeds) and 'Hexaprin' (preventing the growth of weeds for a time on an already weed-free terrain).

Only in full summer he combats a shoot-eating plague with 'Tameron' (there are better products, but more expensive), for this plague isn't present with a lot of rain. He has 2 'Nutrán' applications (on day 15 and 30), for maize needs a lot of nitrogen.

5) The harvest: After 2.5 months he harvests maize-ears for the nacional market if the price is high enough to make it payable. If not he bends the plants down to let the maize-ears dry for 1.5 months and sell them to the 'Consejo Nacional'. He prefers selling to the nacional market for being less time consuming, needing less costs and losing less product.

6) Why maize? The main reason for producing maize is that it provides a very fast income (just 2.5 months), unlike any other product. Besides maize can always be sold, on the nacional market or to the 'Consejo Nacional'. The problem is that profits are often low due to high input prices and low output prices (because of a saturated maize-market and the 'middlemen').

4.1.2 Conclusions:

Luis, always working hard on his farm, is in the possession of good soil. Therefore he hasn't got the problem of a restricted product choice. His problem lies in the fact that he lacks money

resources to initiate higher profit products, and thus he remains in the vicious circle of producing low-profit maize. He earns some extra income in making coffee-baskets so he never is without income, meaning higher income security.

Knowing he has got good soil on his farm and being actively involved in organizing more facilities in the Agrimaga settlement (for only three organization ones future can be improved), he is hopeful for a better future in which he can survive and grow.

4.2 Farm 2: Nefti

Grown up in an agricultural environment, Oscar also hasn't got the ability to earn his living in an other form. Therefore he bought a farm of his own (one year ago), with the help of accumulated capital built up by working on a banana plantation. He has good hopes to obtain a better future by working on his own farm, in-contrary to working on a banana plantation with no hope for a 'better' future (though earning a fairly good income). His farm hasn't got very fertile soil but he will find a suitable way to farm it.

On his five ha big farm he tills chili (1 ha) and plantain (1 ha). He rents two parcels of land, to produce five ha of cassava, for his farm is too small to make a living of.

In the future he will keep one ha with chili picante if his contract with the factory which buys his chili, remains. He will also cut up his three ha big forest a bit, to plant more plantain and obtain some pasture for dairy cattle. In both products he has got experience and both are apt for his farm.

4.2.1 The product chili picante

1) Soil preparation before sowing: Ten days before sowing he cuts up the weeds low so he doesn't have to use much herbicides. Hereafter the weeds grow fast and he applies a herbicide (Gramaxone) to obtain a terrain free of weeds. He doesn't apply herbicides himself for it affects his health. Sometimes when the weeds are very tough/high he uses a little fire to obtain a terrain easier to sow, but he thinks applying fire destroys the soil. For him this is the only way to prepare his soil for production, for working with a plough is too expensive and the slope of his terrain is to inconvenient to use it.

2) The use of seeds: He bought the seeds of a chili farmer, washed and dried them for 15 days in the sun. He made an area of three m² and sew the seeds in rows. He applied a fertilizer recommended by agronomists (Formula Completa "12^P24^K12") and an insecticide (Counter). After eight days he applied more fertilizer and when the plants were 20 cm high he planted the strongest and healthiest on his prepared terrain.

3) The sowing: The earth being fresh after shoveling with a spade, the plants can easily be planted. He uses a one m inter-plant- and 1.5 m between-row distance. Like this the plants can grow considerably, and he still has enough room to harvest.

4) Soil and plant maintenance: When the plants are in production he doesn't apply 'Gramaxone' but cuts up the weeds, for he doesn't want to destroy the fruits and the flowers with this herbicide. Weeds are combated so the plants don't get overgrown and can be fertilized.

Once per 1.5 month he applies or 'Formula Completa "12^p24^x12'

 to strengthen the plants or 'Nutrán' to supply nitrogen.

When the plants blossom he applies every eight days an insecticide (Tamaron) in combination with a fertilizer (Foliar) to strengthen the flowers. When the chili flowers dry up quickly he uses a product called 'Azuflores'.

There is a root-entering sickness (supposedly 'Maya'), which he combats with 'Carbulina' attacking the micro organisms in the soil. The problem is that there is no one around to give advise about the treatment of this sickness, destroying many plants.

5) Why chili? When Nefti came here he wanted a product that grows fast and has relative fast profits (four months). Because he obtained a contract with a factory he was ensured of a guaranteed market. Another important reason for planting chili is that it can be harvested weekly for about one to 1.5 years, so he is ensured of income for at least one year. With these weekly incomes he can keep on living with his family and start initiating other more payable projects in the agriculture. The only problem Nefti has with the production of chili is his lack of experience with this product, and the lack of agronomists educating him.

4.2.2 Conclusions

Nefti, though having low quality soil, has got the advantage of having accumulated capital which permits him to think in more profitable products (than maize), of which he can make a living and start initiating other higher profitable products (having the disadvantage of a long investment period).

Nefti gave the impression of, though being inexperienced producing own products, wanting to work hard on his own property. With his farm he has got hope for improving his living conditions, for he is the one responsible for it. A primary condition to survive though, is the organizing of the farmers of the Agrimaga settlement, to stand stronger against external influences (governmental laws, product prices etc).

4.3 Farm 3: Oscar

Grown up in an agricultural environment, Oscar is very content with working in the nature on his own property. He tills his five ha big farm for: products for home consumption and for the market. He makes extra earnings in taking pictures and mandating farms. Nowadays Oscar thinks it's better to work as a day-labourer, than making a living of the agriculture. For this way one is always sure of being able to eat each day.

In the future he will keep on producing maize (1 ha) and cassava (0.5 ha); Start with more established products (like palmheart, papaya) for which he needs credit, because of high investment costs; And he wants to start with chickens (50 to 100) for the selling of eggs (a job perfect for his wife). The problem is that even for a good idea like this he can't obtain credit.

4.3.1 The product maize

1) Soil preparation before sowing: When the weeds are high he cuts them up low whereafter he applies a little fire. Though fire destroys the protective layer of a soil, it is a fast and cheap way to obtain a clean terrain. After a fire application the weeds grow fast so he applies a herbicide (Gramaxone). When the weeds are low he usually applies a strong herbicide (Roundup), not less than eight days before sowing for it can destroy the maize seeds. His way of preparing a terrain is always strongly related to how fast he needs income and his budget volume for making costs. Though he wants to work in a more soil protective way (only cutting up weeds) this isn't possible for he hasn't got the available time.

2) The use of seeds: He buys seeds of variety 'H5G' at the 'Consejo Nacional' or the 'MAG', for the plants don't grow high and produce big maize-ears. Formerly he used 'Diamantes' for its being well adapted to the zonal climate. But he never knew if the seeds were well selected and of high quality. In contrary to, buying seeds at these institutions guarantees high quality and growing ability of all the seeds, a treatment against rats and insects and that the seeds can be bought on short notice.

3) The sowing: Four persons sow two seeds per hole with a 40 cm inter-seed- and 90 cm between-row distance, and two persons apply a mixture of an insecticide (Counter) and a fertilizer (Formula Completa $10^{P}30^{K}10$). Like this he doesn't lose much productive terrain and practically all plants grow uniform and well. He used to sow one m per one m because of the non existence of fertilizer and the existence of more fertile soils. But he didn't have as much production/ha.

4) Soil and plant maintenance: Depending on the soil preparation before sowing, he applies one to two times a herbicide (Gramaxone) during production (not when the plants are small).

When the plants are about 0.5 m, there is a shoot-eating plague which he combats with 'Tameron'. There is a better product, but more expensive. With 'Tameron' he applies a fertilizer (Foliar) to strengthen the shoots and leaves.

When the soil is very humid a problem appears in that the maize-ears rot when drying them to sell to the 'Consejo Nacional'. Around 15 and 30 days respectively after sowing he applies a fertilizer (Nutrán), for maize needs a lot of nitrogen. At times he uses a fertilizer (Urea) of better quality but more expensive. Agronomists recommend planting a kind of bean, which has as advantages that it adds nitrogen to the soil and stops the weeds from growing. He will sow them when the seeds are given.

5) Why maize?: The biggest advantage of sowing maize is that when one needs money this is the product that produces the fastest profits, though the profits aren't high. The biggest problem is that of the 'middlemen' buying the maize cheap to sell it for a much higher price in the market. A simple solution for this is organizing the farmers to buy a small truck for collective use and responsibility. Another problem is maintaining a clean field in which the maize plants can grow optimally. Especially for Oscar, who commits a lot of devotion in working for the Agrimagan community.

4.3.2 Conclusions

A main objective in Oscar's farming is that the products can be sold on the market and can be used for home consumption. A big bottleneck is the fact that though having good ideas to exploit his farm he can't carry them out for he lacks financial facilities and the capacity to obtain them. Another problem is his time available for working on the farm, because he spends a lot of time for the community creating better living conditions for the community and his family.

A marked point is that Oscar doesn't have a fixed canvas for producing a product. His way of production depends strongly on available time, present material inputs (money) and his feeling like it. This makes Oscar a farmer with a flexible way of working in the agriculture (there is always a solution to a problem).

4.4 Farm 4: Marcos

Grown up in an agricultural environment Marcos has two reasons for being a farmer. It's the only medium for him to survive in a legal way; With the agriculture he can supply the national market with food. Formerly he used to rent land, for lacking money to buy his own.

On his nine ha big farm, he has a small part with cassava for the market. But the price of cassava is so low that he won't harvest it, for it isn't profitable. He will keep on sowing maize on 1.5 ha apt terrain. Because his usable agrarian terrain is

about 1.8 ha (he has got six ha of swamp) he will keep on renting land (two ha) for the production of maize on a neighbor farm. Maybe there is a possibility for him to sow pineapple, working with ten farmers in cooperation with the 'Standard Fruit Company'. A disadvantage is that the pineapple-apt part of his terrain lies on a slope, so it can't be ploughed.

4.4.1 The product maize

1) Soil preparation before sowing: He applies a herbicide (Roundup: superior to any other herbicide) when the weeds are dry, for otherwise it doesn't work. If he has got time available he cuts up the weeds which 'Roundup' doesn't affect. When there are a lot of weeds he also applies a little fire for a very clean terrain, because he can sow better without them. If he had the money he would rent or buy a plough for soil preparation, for it costs less time and delivers more production.

2) The use of seeds: He buys seeds of variety 'HS5G' for the maize plants remain small and the maize-ear quality is very good. Though he buys well selected seeds of the 'MAG' he tests ten of them (when he has got the time) to see how they grow. These improved seeds deliver superb quantity, but when producing for the 'Consejo Nacional' they are bad for they dry slowly and are troubled with rot (which he tries to avoid by sowing in the summer). The local maize is better for the 'Consejo Nacional' for it's more adapted to the climate conditions. He used to sow seeds of his own of variety 'B833', but after three harvests the plants grew much to tall and fell down easily because of wind and rain.

3) The sowing: Five persons (four hired) sow two seeds per hole with a 40 cm inter-seed- and 110 cm between-row distance, and three apply a mixture of an insecticide (Counter) and fertilizer (Formula Completa $^{10}P^{30}K^{10}$). The fertilizer only is applied when it doesn't rain, and if it does he applies it after eight days, so he doesn't loose the fertilizer through leaching. He used to sow 50 cm per 110 cm with 3 seeds per hole, but a lot of seeds didn't grow or remained underdeveloped in growth. With his new sowing method there is less competition between the seeds and the fertility of the soil doesn't decrease as fast.

4) Soil and plant maintenance: To obtain a weed free terrain he applies a herbicide (Gramaxone) three days before the growing of the plants. When the plants are bigger than 0.5 m he applies 'Gramaxone' when necessary. He combats a shoot-eating plague with 'Tameron'. He used to use an other product (Furaran), but this was véry smelly. He doesn't like to apply too much insecticides for it can intoxicate the plants.

Fifteen and 30 days respectively after sowing he applies a fertilizer (Nutrán) for maize needs a lot of nitrogen.

Nowadays he produces the maize-ears for the 'Nacional market'

instead of for the 'Consejo Nacional', which has a lot of advantages: He doesn't lose time with bending down the plants and letting them dry for 1.5 months; He doesn't have to pay for transport; He doesn't have to cut up the weeds; He doesn't have to go to the bank; And he can obtain his profits much faster.

5) Why maize? The farmers that sow maize are poor fellows, for producing maize is the fastest way to obtain profits though these are low. Farmers producing maize don't have resources to produce a product that extracts much higher profits. Problems with maize are rain (causing rot) and birds (eating the maize), but only when producing for the 'Consejo Nacional'. A problem with this institute is that it has a very strict selection of the maize-ears.

4.4.2 Conclusions

Marcos has got two main problems. Firstly, though having a farm of nine ha, he only has got 1.8 ha producible terrain. Secondly he hasn't got the money resources to initiate the production of higher profitable products. Not having money resources means he always has to depend on a product that abstracts fast profits. Therefore Marcos is rather pessimistic about the future. And if the farmers in the Agrimaga settlement don't organize themselves to stand stronger in negotiations with the government for a better future, he will eventually sell his farm for having no hope on a better future.

4.5 Farm 5: Adem

Grown up in an agricultural environment farming has grown to a habit for Adem. He came here for he didn't own land, and it's better to live on a farm on which one can sow some products. In reality people can't earn good money with farming (people in the Agrimaga settlement often lack money to eat). If he had the resources he would stop working in the agriculture.

When Adem settled down he thought his 7.5 ha big farm had a soil more apt for agriculture to be able to live from, but he definitely can not. The only product with which one can survive is cattle, but his farm is too small for cattle and he hasn't got the money to buy it. Therefore searching an other way to survive he started working on a banana plantation with which he slowly wants to accumulate some capital, to start producing some high profit products (cattle, pineapple). Meanwhile he uses his farm to produce for home consumption, a little selling and letting parts to an other person.

4.5.1 The product cassava

1) Soil preparation before sowing: Two months before sowing he keeps his terrain untouched, whereafter he cuts up the weeds low.

Just before sowing he applies a herbicide (Gramaxone) to obtain a cleaner terrain (Gramaxone for this is an overall herbicide). He doesn't apply fire for it destroys the weed-nutrients which the cassava needs for developing.

If he had the resources he would prepare his terrain by ploughing for this delivers a higher quantity of products.

2) The using of seeds: He has got own seeds of variety 'Valencia' for these deliver a higher quantity of product and are easier and faster harvestable than other varieties. He selects the seeds himself on the criteria of sufficient size.

3) The sowing: A lot of people sow the cassava with a 30 cm inter-seed distance and a one m between-row distance, but he sows one m per one m, for the cassava develops bigger with a better quality.

4) Soil and plant maintenance: When the plants are small he cuts up the weeds (for the plants are vulnerable for herbicides). After reaching a 0.5 m length he applies 'Gramaxone' every three months. At times he has to apply an insecticide (Counter) to combat the roots being eaten. And at times he applies fertilizer (Nutrán) so the plants develop and grow faster.

5) Why cassava?: He doesn't sow an other product than cassava for he hasn't got the resources to sow an other product also apt for his low fertile soil. An advantage of cassava is that it doesn't need much manual labour nor investment to obtain the product, so he can combine it with his work on the banana farm. On the other hand cassava has usually a low price for there is too many on the market.

4.5.2 Conclusions

Adem wanted to have a farm of his own to sow of a lot of products a little. The problem is that in reality the soil of his farm isn't apt for producing a lot of products. An other problem is that Adem hasn't got the resources to exploit his farm in a way he can survive of. Confronted with these problems he had to search for an other survival strategy, finding this in working on a banana plantation.

4.6 Farm 6: Rigi

Grown up in an agricultural environment Rigi likes to sow, and could obtain a farm. Earning little money he fills up the gap by working in a car repair shop in the morning and his wife takes care of a small Pulperia² (having a car to supply the shop).

² A small shop for foods and drinks

On his 9.5 ha big farm he only produces cassava (2.5 ha), having a lot of experience with this product (family tradition). He is thinking about sowing one or two ha of pineapple in the near future, for a cooperation between ten farmers and the 'Standard Fruit Company' is in the making. This means, though producing under strong agreement-conditions, a regular and fair profit income for a longer period. Also his soil is apt for pineapple.

4.6.1 The product cassava

- 1) Soil preparation before sowing: Fifteen days before sowing he cuts up the weeds (if not the herbicide application is too costly), and two days before sowing he applies a herbicide (Gramaxone) to obtain a clean terrain ready for sowing. He doesn't apply fire for it destroys the weeds, acting as a fertilizer. Besides weeds grow fast after a fire application. If he had more money resources he would prepare his terrain with a plough for this results in a higher output.
- 2) The use of seeds: He has got three own varieties: Valencia which is adapted to the climate and has the best market; Manji (the variety he only used formerly) he produces for it is well adapted to the climate, yields high quantities of product and is long tenable in the market; Sopilota, a variety developed by CATIE, yields very high product-quantities and can be harvested easily. His motive for sowing three varieties is that there is always a market he can sell his product to. It is a way to spread production and selling risks.
- 3) The sowing: Rigi selects the seeds for only he knows which has quality. He sows with a one m per one m inter-plant distance. With less space per plant each plant yields much less product.
- 4) Soil and plant maintenance: When the plants are small he cuts up the weeds to apply herbicides around the plants. When the plants are bigger he only uses 'Gramaxone' to combat the weeds. Cassava isn't affected by plagues (only weeds) nor sicknesses. He doesn't apply fertilizer for the plants don't need it.
- 5) The harvest: He harvests 'Valencia' after ten months. Manji and Sopilota are harvested after 12 months. He harvests the quantity the 'middlemen' ask for. An advantage of cassava is that it can remain unharvested for a long period.
- 6) Why cassava?: His parents always used to sow this product, thus he has got a lot of experience with it. But the principal reasons are that his soil is apt for this product and one doesn't need many investments (so it isn't affected by his lack of money resources), nor manual work. The problem with cassava is that it can get very cheap (the phenomenon 'Cob-web' plays an important role). The solution is to

make an farmer-organization to export the cassava, for this is the most profitable market (but Rigi can't do this alone).

4.6.2 Conclusions

Having no money resources, and gaining little on cassava, Rigi earns his living with working outside the agriculture, for this is an ensured way of living (unlike the agriculture). Soil-aptness also plays a major part in his making of decisions. Though earning enough money (for living) outside the agriculture it still remains difficult to escape the 'ever-low money trap'.

4.7 Farm 7: Don

Don, grown up in an agricultural environment, loves to sow (it's his destiny). Besides he hasn't got the education to do something else. He bought his farm because he wanted to survive in the way he chose.

The soil in the Agrimaga settlement is very apt for sowing fruit trees, for it isn't very fertile. With trees the soil remains preserved. Therefore he chose to work every morning on a nearby farm (12 ha), on which the owner doesn't live nor work. With this he can earn enough money to survive, while sowing on his own farm (nine ha) trees which will have an established production in the future. He will extract a regular and good income when these trees start producing.

In the near future Don will sell his farm and buy a house with 0.3 ha of land to sow vegetables with which he can obtain high profits. The rest of the money will serve for interest-income. The reason for selling is twofold: He is becoming old and can't work as hard as he used to; His children will live nearer to school (educating themselves for a better future).

4.7.1 The product Palmheart

1) Soil preparation before sowing: He prepares the soil only by cutting up the weeds low, whereafter he begins with sowing. He doesn't use fire nor herbicides because: They destroy the natural waste products (acting as fertilizer), thus exhausting the soil; Weeds maintain a soil-humidity good for plant development; With destructing plant wastes, erosion becomes a problem. There is a weed (agronomists recommend) that maintains a humid soil and stops the growing of other weeds. This weed is a good idea, for palmheart intoxicated with herbicides doesn't sell well.

2) The use of the seeds: He bought seeds of an other farmer, washed them and put them in a sac for 22 days, which he kept it humid to stimulate the root-growth. Afterwards he sowed the seeds in small plastic bags, and two months later they were sown in the soil. With this seed-preparing method he doesn't loose as much

seeds as others do, for they sow them and let them be eaten, despite applying insecticide and fertilizer.

3) The sowing: The correct sowing method (with caution) is one m inter-plant- and two m inter-row distance, for not much productive terrain is lost, the production is always good (though needing much fertilizer) and there still is enough space to walk. On his own farm he sows with an other idea: When someone is poor, one doesn't have money for fertilizer, and thus has to sow with a much wider inter-plant distance so the soil can supply all the nutrients. An other advantage is that the palmheart plants develop more product per plant (output/plant is higher). He sows better than others for he sows with faith in nature.

4) Soil and plant maintenance: Every month he cuts up weeds around the plants, and the old trunks. And he prunes the plants (for better plant development and more sun light). Once in three months he applies a herbicide (Gramaxone) between the plant rows to obtain a terrain freer of weeds. He uses little herbicide for he doesn't want to affect the plants nor the soil. Every month he strips of superfluous suckers maintaining about four suckers of different size for a continuing production. With too many, none of them develops. He combats a plant-eating insect with an insecticide (Counter). If he doesn't these insects will multiply and he will loose the palmheart area. He combats a shoot eating plague with 'Tamaron', and at the same time applies a fertilizer 'Foliar' to strengthen the leaves of the plants. There are better products but they are more expensive. Humid soils he combats with irrigation channels. If not the plants don't develop.

Don would like to apply fertilizer every month, for the production is very soil intensive (it's the same with chickens: one needs to feed them every day, if not they do not develop or die). But his patron demands him to apply every three months. He also would like to apply fertilizer in the center of two plant rows for there the most productive plant roots grow. But though his patron had an education on the 'Colegio Agropecuario' he demands to apply the fertilizer at the beginning of the plant. Don considers his patron as a person that only takes from the land and never gives back.

5) Why palmheart?: For Don the reason to sow palmheart was at first to sell the small plants to his patron. But he changed his motive and sells nowadays his own product on the Rio Jiménez market. A big advantage of palmheart is that it is a well established plant: every week the palmheart terrain can be harvested, thus every week there is an income flow. Besides his farm contains an apt soil for palmheart.

Don thinks his patron has got palmheart because it is an

established plant, so no 'precaristas'³ will enter his farm.

4.7.2 Conclusions

This 50 year old farmer has worked whole his life in all kinds of agriculture. He has an enormous amount of experience and knowledge. Listening and learning from agronomists he always has got his own ideas with which he works. Don is a farmer who works with nature, being a part of it.

Though having a farm with a rather infertile soil and a lot of slopes, he has found a way to use it well. He is annoyed with farmers blaming the infertility of their soil for their poverty. Because in the meantime they don't till or sow their land, while it's very well possible.

The difference between Don and his patron is striking: He himself working as a part of nature, tries to maintain the fragile natural balance on his farm, while his patron only thinks in economics on the short notice (taking from the land without giving back).

4.8 Farm 8: Carlos

Grown up in an agricultural environment and educated on the 'Colegio Agropecuario', his being a farmer is a logical choice. But his main reason is that he can be his own boss, and therefore can divide his own time and do as he likes (he never gets bored). When he settled down on his seven ha big farm he thought of sowing crops like maize, beans and rice. But with these products there is no improvement for he can't save any money. Thus he began with products (palmheart, cattle, papaya) his family could eat and he could sell as well while his bank-account grew.

For the future Carlos thinks in three products: Pasture for cattle, because milk can be used for home consumption, the males can be sold for a good price and it's a labour extensive way of farming; Pineapple because it has a good prospect, for ten farmers are going cooperate with the 'Standard Fruit Company', which means good selling prices and assured income; And palmheart, for it is an established product with growing cooperation amongst farmers, a growing export market and transport constancy.

4.8.1 The product palmheart

1) Soil preparation before sowing: One month before sowing he cuts up the weeds (so he can apply less herbicides and his health doesn't get affected). He applies a herbicide (Roundup) 15 days before sowing for it's a systemic product that works thorough.

³ People who occupy a piece of land to obtain the land use rights

One day before sowing he applies 'Gramaxone' to finish the job. He doesn't apply fire for this destroys the soil structure.

2) The use of the seeds: He used to buy small plants, but nowadays he sows the seeds himself to replace dead and sick plants. He puts the seeds in a bucket with water and the ones that float don't serve. He dries the good ones, puts the seeds in a ploughed area of three m², covers it with bark (for maintaining the humidity) and makes it all very wet. He covers all with banana leaves and after one month the seeds are little plants. Formerly he used to just sow the seeds but he lost a lot of seeds because of rats and insects and the plants grew very slowly.

3) The sowing: He sows with a one m inter-plant- and two m between-row distance. With this method he doesn't lose much producible terrain and there is still enough room to walk (which is necessary for these plants have ferocious thorns).

4) Soil and plant maintenance: Once in three months before applying fertilizer he cuts up the weeds around the plants and the old trunks, and prunes the leaves. He also strips off superfluous suckers to maintain four different sized suckers to keep on a continuous production. After the cleaning of the plants he applies a good-working herbicide (Round-up), which doesn't affect the plants. He doesn't use 'Gramaxone' for it does affect the plants. There are at times some plagues and sicknesses, but they appear very scattered and thus it isn't payable to combat them. Every year he has four fertilizer applications. The first two years he begins with 'Formula Completa 10^P30^X10', for this strengthens the growth of the plant, and he applies 'Nutrán' three times. Hereafter he begins with an application of 'Formula Completa 18^P515^X62' to maintain the growth of the plants, and then 'Nutrán' three times. This is the technical packet for fertilizing palmheart.

5) Why palmheart?: The main reason for having palmheart is that it is a well established plant with a long production period. It has got a growing market, thus having got good prospects for the future. Also it has got few problems (especially on his apt soil).

4.8.2 The product cattle

1) Pasture: He prepared his four ha terrain by cutting up the weeds, whereafter he applied a herbicide (Tordon 101) which doesn't affect the pasture. He applied it with a motorsprayer for the herbicide is bad for ones health. He sowed the pasture of variety 'Retana' for it's a fast growing variety (8 days), and easy edible by the cattle. Also 'Retana' is a pasture very common in these areas (it grows in the wild), and apt to the climate.

2) Cattle: He has got two cattle races, which serve well enough for milk and meat production. There are better quality races but these are more expensive.

In the future (when he has got more money) he will sow different parts of his farm with different pasture varieties (one will be an Arachis, recommended by agronomists). This is so his cattle won't get accustomed to just one pasture. A little variety in food is good for cattle (this is the same as with people).

3) Why cattle?: Cattle has got a lot of advantages: It produces milk that can be used for home consumption and can be sold; After seven to eight years the cows don't produce any milk and have developed well enough to be sold; Cattle doesn't need much labour. This is an important reason because he couldn't bring this four ha into another form of production, for he already lacked time producing palmheart and papaya; Another reason is that the river 'Parismina' inundates at times on a part of his terrain. So this can only be used for cattle.

Cattle hardly has got any problems. The main problems are plagues caused by parasites, but these can be combated easily.

4.8.2 Conclusions

Carlos who began with the intention to till products like maize, beans and rice, changed fast of intention. For these products don't deliver enough profits to become a growing agricultural enterprise. He works hard on his farm and also is strongly involved in the improvement of living in the Agrimaga settlement. He has got a strong sense for economics, projected into the future (cattle, pineapple, palmheart).

Though being just a small farmer (seven ha) he appears to be in a process of economic improvement. Provided that the farmers organize themselves (like in the pineapple project), he will have a future of growth.

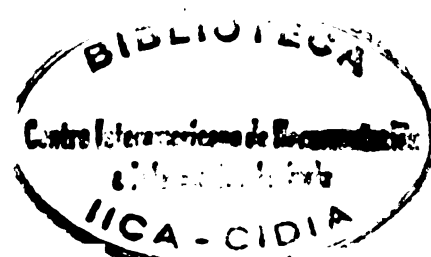
In this chapter general findings will be noted, encountered on the 8 studied farms, concerning the farmers attitude towards present agricultural reality. These findings are the result of three principal questions posed during the research on these 8 farms (as noted in chapter two).

All information given is obtained directly from the farmers.

5.1 Problems and possible solutions

The problems encountered by the 'small farmer' of the Agrimagan community and the possible solutions put forward by the eight farmers, will be noted.

- 1) The market does not offer an established nor a guaranteed price for the products. This finds it's cause in the fact that the market at times is saturated. A solution would be the government planning the agricultural market by dividing the country in agricultural regions, where in certain parts people produce one product and in other parts another product. In this way supply can be adjusted to demand, with an established price as result.
- 2) Lack of money-resources to initiate the production of higher profit products. This problem could be solved with the help of credit. But in reality it's difficult to obtain credit, for a lot of conditions are attached to the obtainment of bank credits. Besides banks prefer 'big farmers' as creditors. A 'small farmer' isn't an interesting investment.
- 3) Another severe problem, connected to that of the market, is that of the 'middlemen' buying the agricultural products for far too low prices. A simple solution would be that the farmers together buy a means of transport with which they can earn better prices for their products. Two problems occur: Difficulty in organizing farmers in a uniform way and lack of credit.
- 4) Another problem is that during the past 5 years input prices have risen enormous while off-farm product prices haven't.
- 5) The roads in the Agrimaga settlement are of such low quality that there are too few 'middlemen' entering the settlement to buy the products (At times none). This problem has got it's negative effect on the product prices and a high income risk is involved. The solution is to organize the farmers for improving the roads.
- 6) The farmers themselves. The farmers of which the living-conditions are hard, do not put their hands together to fight against negative external influences to improve their futures.



7) Especially in the case of the maize-farmers the lack of governmental support. Nowadays the country imports maize of other countries.

5.2 The future of the 'small farmer'

There is a strong resemblance between the 8 farmers, in their expectations about the future for a small farmer in the Agrimaga settlement and in Costa Rica as a whole. The farmers have to cooperate much more in the future, if they want to stand stronger against external influences and to organize themselves for their betterment. If the farmers of Agrimaga aren't going to cooperate their situation will get worse than it is now, until they can not cope anymore in the agriculture and will have to sell their farms.

Thus for maintaining a future in the agriculture the 'small farmers' have to organize themselves. If not they will disappear.

6 AN INITIATIVE TO A FARM CLASSIFICATION

In this chapter three farm groups⁴ are distinguished. This is to state the importance of the farmer himself, in creating his agricultural mode. The farm groups are distinguished on basis of farm- and farmer-characteristics (encountered) which cause the different agricultural modes. The characteristics used are:

- 1) Money/ capital availability
- 2) soil aptness for agricultural production
- 3) characteristics of the farmer
- 4) additional labour
- 5) attitude towards problems (noted in chapter 5)
- 6) attitude towards discrepancies between present agricultural mode and one of it's alternatives (noted in chapter 2).

Group one and two are opposite groups. Group three, though appearing to be similar to group two (in physic and economic characteristics), approximates group one in also being able to create a hopeful and successful agricultural mode.

6.1 Class one: Luis and Carlos

Both farmers belong to group four, 'buyer of manual labour' of the hypothetical typology (Appendix 1).

For both farmers there is no soil-restriction on product choice, because both farms consist of relative good soils. Carlos is better educated (he passed the 'Colegio Agropecuario').

⁴Only five farmers are included in the three groups, for these can clearly be distinguished from each other.

But both have and maintain an extensive web of contacts -being president and secretary of the association of small farmers of Agrimaga- with high-school 'Earth', the middlemen, and the 'MAG'. Besides both are included in, 'starting' farming-cooperations. Both farmers don't earn wage-income outside the farm. Both think of, prices in the market, the middlemen, bad roads and lack of money, as the main problems of small farmers in Agrimaga. Herein they distinguish themselves, by having ideas how to solve these problems without external help. Both adapt as much as possible to recommendations done by agronomists, within their range of productive resources. There is one clear difference, in that Carlos produces products with long investment periods for which he needs/ has supporting capital. Whereas Luis is less capital independent.

6.2 Class two: Oscar and Marcos

Both farmers belong to group five, 'farmer - halfday labourer' of the hypothetical typology (Appendix 1). Both farmers are strongly restricted in product choices due to the problem of lack of money, and besides due to respectively, low soil fertility and low terrain useability of their farms. They do not have as many contacts as Luis and Carlos of group one, but both cooperate in organizing Agrimaga, in general. Both farmers have to supplement their farm income at times by working off-farm. Both point to, prices in the market, the middlemen and lack of governmental support as the main problems, for small farmers. They have ideas about the solutions, but these remain very dependent of governmental institutions. Marcos would like to have more money to adapt more to the recommendations of agronomists. Oscar would like more money to perform his ideas, that fit in his labour extensive way of work.

6.3 Class three: Don

Don belongs to group six, 'halfday labourer - farmer' of the hypothetical typology (Appendix 1). Lack of money restricts Don to work in an input intensive way, so he works on his farm in a more input extensive way. Though the soil of the farm is low and the terrain is slopy and swampy, he farms the soil optimally by sowing fruit trees. Don hasn't got any education, but an enormous experience in the agriculture. He has got contacts, but doesn't need them much. He will earn an income outside his farm, until the fruit trees start producing. Don points out as a problem for a small farmer in Agrimaga, that they do not organize to overcome problems confronting them, or create new possibilities. For Don, working in the agriculture, is adapting ones farming mode to the limitations one has, thus to reality.

There are two bottlenecks (determining choices made) that occur at the eight case-study farms.

The most important is the lack of money to perform productive activities which one has in mind (rising input prices relative to output prices worsens the problem). The lack of money often means not being able to make investments necessary to produce products with higher returns. Thus one produces fast-earning thus often low-earning products, with which one can not initiate the production of higher earning products (a vicious circle remains).

An other problem confronting a lot of small farmers of the Agrimaga settlement is, the low fertility of the soil and the low useability of the terrain because it's often hilly and swampy. This limits the farmer in making choices due to lack of options.

An interesting point is that though the Agrimaga settlement is a small settlement it is diverse in existing agricultural modes, in which the small farmers try to survive. This is not only because of the different degrees in which the problems of, lack of money and useability of the soils, occur to each farmer. But it is also related to who the farmer in question is.

It is made clear (in chapter 6) that class one and class two are opposite classes. But also can be seen that though the farmer of class three appears to be in the same situation as the farmers of class two, it has a completely different agricultural mode and also seems to cope better with the agricultural reality.

Who the farmer is, depends on factors such as: upbringing, education, experience, religion, origin and last but not least contacts (relations).

A factor strongly influencing the future of small farmers in the Agrimaga settlement and in Costa Rica in general, is if the small farmers organize themselves (for instance in product- or selling cooperations). With the 'organizing' the small farmers can attack marketing- and institutional problems which occur to them as a collective, and create more possibilities. This is for they stand mutually stronger in negotiating for a better future.

ALFARO, R., 1993. Analisis de inventario en una comunidad campesina de la Zona Atlántica de Costa Rica: el caso de Agrimaga. Report No. 43, phase 2, Programa Zona Atlántica (CATIE-WAU-MAG). Turrialba, Costa Rica.

DOORMAN, F., 1991. La metodologia del diagnostico en el enfoque 'investigacion adaptiva'. El estudio de casos. Den Haag, Holland.

DOORMAN, F., 1991. La metodologia del diagnostico en el enfoque 'investigacion adaptiva'. Anexo 3: La guia de entrevista del estudio de casos. Den Haag, Holland.

MITCHELL, J.C., 1983. Case and situacion analysis. The sociological review, Vol. 31, May 1983.

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APPENDIX 1. Hypothetical typology of the farmers

The information obtained in the inventory study has been used to establish a typology of the farmers which demonstrate a similar rationality in their productive strategies.

type one: 'Investor'

This group consists of one person who, lives and runs a shop in Río Jiménez. The soils of the two farms he bought in Agrimaga are acid and low of fertility. He uses hired labour to produce mainly Palmheart and appears to make investment decisions on basis of maximum net income. He does directly participate in the commercialization of his products and also acts as a middleman for other farmers, which indicates he knows his way in the market.

type two: 'Investor - Farmer'

This group consisting of four farmers primarily differs with the former one in the fact that they use hired labour and also their own labour, and secondly in their possession of black and brown soils which permits them a major flexibility in choosing products for development.

The two types of farmers also have characteristics in common:

- they do not live on their farms,
- apparently they are more interested in the surplus value of the land than in the using of the land,
- apparently their investment decisions are orientated on searching alternatives which offer a major rentability,
- the agriculture is an additional income, they fundamentally depend on non-agricultural activities outside their farms,
- their present situation is the result of knowledge and accumulated capital which they use for other economic activities.

type three: 'seller of services'

Though the living mode of these two farm owners is in the agriculture, their main activity is the selling of services. One possesses a cattle farm outside the settlement and earns his living with cutting wood in the forests with a chainsaw. The other possesses a small truck and a pulperia. Both complete their income with the production of respectively plantain and cassava for the internal market. Finally can be pointed to the fact that these service-sellers are in a process of growing economic independence. Apparently their rationality is to integrate in the category of 'type one'.

type four: 'buyer of manual labour'

This group of three farmers contract manual labour. The three farmers initiate the exploitation of their farms without former accumulated capital. Two of them are president respectively secretary of the 'association of small farmers of 'Agrimaga'. They both have more or major access to information, which permits them to take advantage of promotion projects of different agencies (related to the development of the region). Also their condition as leaders has a major capacity in negotiations with commerciants and intermediaries.

type five: 'Farmer - half-day labourer'

Though the eight farmers of this group obtain farm-income it's not a sufficient basis to live on for their families. They have to complement their low incomes with the selling of manual labour to farmers in the vicinity. The productive strategies seem to be determined by the physical and chemical characteristics of the soils (the majority have red soils of low fertility, high acidity and high quantities of clay), and the disavailability of enough producible land (because of the existence of much permanent swamps) in relation to the quantity of availability of manual labour.

The wish to exchange reflects a search for better alternatives for the traditional products. This process can improve the work of the women and the children in a more intensive form, for now the participation of these members in farm work is sporadic.

type six: half-day labourer - farmer'

The farms of the eleven farmers are in the possession of red and acid soils especially apt for cassava (not for basic grains). But because of the low prices during the inventory study (260 C per quintal), manual labour for the harvest couldn't be paid. Besides a complaint was that they often loose a big part of the production because they are victims of the commerciants and intermediaries who don't arrive to buy the harvest or devaluate the value of the products. For these reasons their main income is from working on cattle farms and banana plantations. But the older and more disabled ones of this group can't work on one of them. Therefore they sell their manual labour to the 'Investors', and at times receive lower salaries than the average in the settlement. These farmers produce for these reasons products on a smaller scale.

APPENDIX 2. PRODUCT OVERVIEW PER FARM (at present)

	FARM 1	FARM 2	FARM 3	FARM 4	FARM 5	FARM 6	FARM 7	FARM 8
Chili	0.7	1.0						
Maize	4.5		1.0	1.5				
Cassava			0.5	0.5	1.0	2.5		
Pineapple			0.15				0.5	
Palmheart			0.5		0.4		0.75	1.8
Papaya								0.5
Pasture					2.0		3.0	4.5
Plantain		1.0	0.5					
Coconut							0.75	
Forest	0.8	2.5		2.5		4.0	1.0	0.2
Swamp		0.5	0.75	4.5		2.0	2.0	
Other			1.4	0.5	1.1	1.0	1.0	
Rented		5.0		2.0				
Rented out					3.0			
TOTAL	6.0	5.0 (10.0)	5.0	11.0	7.5 (4.5)	9.5	9.0	7.0

Note: numbers between brackets are the inclusion of land rented and rented out.