Bachelor project in the Horticultural Science program
2007:3, 10 p (15 ECTS)

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The Process of Agroecological Transition

– A Case Study from Southern Brazil

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Abstract

This is a participatory case study together with the Non Governmental Organization (NGO) Cetap (Centro de Tecnologias Alternativas Populares) in Brazil and the farmers in two of the groups with whom Cetap cooperates. The objective of the study is to describe and evaluate *the process of agroecological transition* with the aim of improving it. One of the groups is made up of about 40% of the members of the village Vaca Morta. The village is localized in a strongly hilly area difficult to mechanize and the village is known for its internal strong organizational culture. Although participating they have maintained a certain independce from outsiders such as farmers unions and social movements. The second group is made up of farmers spread out over a whole municipality called Ibiraiaras. The landscape here is flatter and the agriculture more mechanized. The organizational culture of the group is weaker but a strong interconnection with farmers unions and social organization stands out in this group. These properties were chosen as criteria for election of the groups for the study since Cetap feel that they are important ingredients in several of the groups they work with.

The focus of the study is to *understand and hopefully improve a complex reality with all its variation in perceptions.* To reach this profound understanding of the situation, *as experienced by the participants*, Soft Systems Methodology (SSM) was the chosen methodology.

An important conclusion of the study is that agroecology is an approach and a process instead of a steady, defined state. Thereby there cannot be a transition to it. Transition is an intrinsic part of agroecology which could be defined as; *Agroecology is a way of understanding and approaching the rural situation. By the help of the underlying premises and basic principles it helps us to develop a strategy of how to coevolve in a sustainable way with our natural and social environment.*

A biological and technological view dominates the agroecological transition in literature. This case study shows that other issues must be given more importance as:

Knowledge
Family Subsistence
Social and Cultural Acceptance and Valuation
Personal and Family Motivation
Power
A Plan
Cooperation

The two groups find themselves in quite different sociopolitical and biophysical situations which have led to quite different processes of agroecological transition. This is also reflected in which of the above mentioned elements they found most important to work with in order to improve their development.

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Terms and Abbreviations

Adatabi	*Associação para o desenvolvimento da Agroecología nos Municipios de Três Arroios, Aratiba, Barra do Rio Azul e Itatiba do Sul.* (*The Association for the development of Agroecology in the municipalities Três Arroios, …* etc.)
Agroecosystem	Defined by Gliessman (2000), as a site of agricultural production – a farm, for example – understood as an ecosystem. It could be defined to any scale although a farm or a field is most common (Altieri, 1995). The agroecosystem provides a framework with which to analyze food production systems as wholes, including their complex sets of inputs and outputs and the interconnections of their component parts (Gliessman, 2000).
AVSF	*Agronomes et Veterinaires Sans Frontieres* (*Agronomists and Veterinaries without Boundaries*) is a French association for international solidarity which acts for rural development, supports rural farming in underprivileged regions and contributes to advocacy and lobbying activity in the North and South in favor of these agricultures by making the most of existing skills in agriculture, livestock and animal health (AVSF).
ANA	*Articulação Nacional de Agroecologia* (*National Articulation of Agroecology* in Brazil) (ANA).
Caritas	*Caritas Internationalis* is: "a confederation of 162 Catholic relief, development and social service organizations working to build a better world, especially for the poor and oppressed, in over 200 countries and territories" (Caritas).
Colonial	Refers to the colonizers and means handicraft products made by small-holders, but not necessarily ecological.
Creole	Something of traditional origin from the colonizers e.g. crop var. or food.
CGIAR	*Consultative Group on International Agricultural Research*
ECOTERRA	*Regional Association for Cooperation and Agroecology,* was created to promote and organize alternative commercialization.
Ecovida	*Rede Ecovida de Agroecologia* (*The Ecovida Network for Agroecology*) is a forum for actors involved with agroecological family (smallholder) agriculture in the southern region of Brazil and works to develop the same. A part of its work is participatory certification of agroecological products (Ecovida).
Emater/RS	*Associação Riograndense de Empreendimentos de Assistência Técnica e Extensão Rural* (*Riograndе Association of Enterprise of Technical Assistance and Rural Extension*) (Emater/RS).
Empowerment	A simple explanation of the concepts e*mpowerment* for the purpose of this thesis is; gaining power over ones life.
Epistomology	They ways we believe that we can learn about our reality.
Future Earth	Future Earth is an international network supporting initiative in development on the basis of social justice and ecological sustainability. The network has member organisations in Latin America, Asia and Sweden working in the format of pilot project, education, information and exchange (Future Earth)
FAO	*Food and Agriculture Organization* of the UN
Gender	*Gender* is often confused with sex. However, sex generally refers to biology and anatomy. By contrast, gender refers to a set of qualities and behaviors expected from a female or male by society. Gender roles are learned and can be affected by factors such as education or economics. They vary

	widely within and among cultures. While an individual's sex does not change, gender roles are socially determined and can evolve over time. (ENGENDERHEALTH)
Green Revolution	During the 1970s an attempt was made to develop advanced agricultural technologies (High yield crops combined with synthetic fertilizers and pesticides) for poor tropical countries and by that reduce hunger (Sayer & Campbell, 2004).
Holistic	The belief that "the whole" is more than just a simple sum of the parts (Kathounian, 2001 p.69*f*).
INCRA	*Instituto Nacional de Colonização e Reforma Agraria* (*National Insititute for Colonization and Agricultural Reform* of Brazil).
Integrated approach	*Integrated approach* comes from integrate, which is the opposite to separate and means to bring things together to a whole.
INRM	Integrated Natural Resource Management, According to CGIARs (no year stated) definition INRM is: "An approach to research that aims at improving livelihoods, agroecosystems resilience, agricultural productivity and environmental services…It aims to augment social, physical, human, natural and financial capital. It does this by helping solve complex real-world problems affecting natural resources in agroecosystems."
MAB	*Movimento dos Atingidos por Barragens* (*Dam Affected Peoples Movement and works for the rights of these peoples*) (MAB).
Mercantilization	
MPA	*Movimento dos Pequenos Agricultores* (Movement of the Small-holder Farmers) works for the rights and livelihood of these farmers (MPA).
MMTR	*Movimento das Mulheres Trabalhadores Rurais* (*Rural Working Womens Movement*) works for the rights and livelihood of these women (Matas Nativas).
MST	*Movimento dos Trabalhadores Rurais Sem Terra* (Landless Workers Movement) works for the rights and livelihood of the landless (MST).
NGO	*Non Governmental Organizations*
Ontology	The way we believe that our world works. How the nature of our reality is thought to be (Sriskandarajah & Bawden 1994).
PJR	*Pastoral da Juventude Rural* is a catholic rural youth movement (Pastoral da Juventude).
PR(M)	Participatory Research (Methodology).
Re-synthesis	Putting the parts back to their context and looking at them from this holistic perspective (my own explanation)
STR	*Sindicato dos Trabalhadores Rurais* (*Rural Workers Union*) is associated to the small-holder farmers. The large scale more commercial (patronal) farmers have a separate union (Guzón 2006).
Systemic	The *Systemic Approach* opposes to the idea of isolated parts taken out of their context. It does not oppose to the analysis of the parts but emphasizes the importance of constantly putting them back and looking at them in their context (re-synthesis). The approach is born out of the need for concepts and methodologies that could help to do this re-synthesis (Kathounian, 2001 p.61).
Technician	Technician is a term used which can be compared to extensionist or consultant. Here it has a less top-down connotation than extensionist which originates from the transfer-of-technology paradigm.
Transfer of technology	A model where scientists produce scientifically valid research results transferred to farmers by extensionists (Probst & Hagmann, 2003)

Chapter 1. Introduction

This is a participatory case study together with the Non Governmental Organization (NGO) Cetap (Centro de Tecnologias Alternativas Populares) and the farmers in two of the groups with whom Cetap cooperates. The study included a year at the setting in Brazil with prior preparations and the final writing of the thesis in Sweden.

The original objective of the study was to investigate *the role of participatory research and learning in the development of low- external and sustainable agriculture* by Cetap and cooperating farmers. When discussing this objective further with Cetap, after my arrival to Brazil, the objective was changed to the *process of agroecological transition*. The motivation was that agroecology better represented the process that Cetap and the farmers worked with than low-external and sustainable agriculture. The main issue seemed to be how to improve this work and several ideas existed on what this study should focus on in order to play a role in this improvement. Some ideas focused on the methodology of Cetap, others on investigating the benefits of agroecology. An objective incorporating both ideas was chosen: *the factors/elements that make small scale family farmers continue with the work of agroecology on their farms*. During the study it was understood that agroecology could not be seen as a static phase, but as a flexible process. It has different meaning and focus for different stakeholders and actors. The study was, as time passed, increasingly focusing more on the process of agroecology with its varying meanings. This lead to a third change of objective to the final one; describing and evaluating *the process of agroecological transition* with the aim of improving it.

1.1. Research Questions

Together with the other participants of the study we were to discuss and define the elements that strengthen the process of agroecological transition. Once defined these elements should serve as a base for action to improve the process. To accomplish this objective we, especially I, needed;

- An understanding of the socio-politic, economic and biogeophysical reality that the stakeholders of this process find themselves in.
- What is their historical and personal background?
- How do they perceive agroecology?
- How is agroecological transition presented in literature?
- Why and how do people engage in it?
- What do they perceive as success and failure?
- Which are their objectives?
- Who are the actors of this process?
- What influence do they have over the process?
- Which methods are used?

Chapter 2. The Study Area and the Subject of the Study.

2.1. Historical Background to the Development of Agroecology

2.1.1. Why is it important to look at the Process of Agroecological Transition? And, what is it?

To get a sense of what agroecology is, it could be described as a science and as an approach to rural development and agriculture, based on a holistic[1]/systemic[2] view on society and ecological principles. The transition process is the conversion of the farm and/or society from the conventional approach to the agroecological one. It is a continuous process which's objective is not merely a economic-productive rationalization, but also a change of attitudes and values in relation to the management and conservation of natural resources (Caporal & Costabeber 2004) as well as social justice (Kathounian 2001, Cetap 2006a).

Why is it important then? The answer will depend on who is asked. Small-holder farmers[3] might say it helps them to stay on the farm at times when many families move to town. It improves their health since they use less or no pesticides, do more diverse work tasks and eat more diverse food. It makes them less dependent on companies, banks and governments which give them more control over what they produce, how they produce, at what cost, how and to whom they sell their products. It lowers their expenses and gives them higher food and income security.

Someone from an NGO, farmers union or social movement might say that it guides us in creating a new relation between people and between people and their environment in order to replace the unsustainable and unjust systems of today.

Scientists might believe it is important because as a science it approaches the rural or agricultural situation from a very broad perspective. It tries to include as many aspects and actors as possible since it acknowledges that they are connected and thereby influences the situation. It is also based on ecological principles in nature which are used to manage the agroecosystem[4] in a sustainable way. This approach helps to cope with reality which we have a limited ability to understand and control.

These are a few examples of how different people give different importance to agroecology. It shows that there is no one true way of looking at it, just different perspectives.

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[1] The term *Holistic* means that "the whole" is more than just the sum of the parts (Kathounian, 2001 p.61).
[2] The *Systemic Approach* opposes to the idea of isolated parts taken out of their context. It does not oppose to the analysis of the parts but emphasizes the importance of constantly putting them back and looking at them in their context – re-synthesis. The approach is born out of the need for concepts and methodologies that could help to do this re-synthesis (Kathounian, 2001 p.61).
[3] Other common terms used in Brazil are Family farmers (most often used by Cetap), Camponeses (political connotation, more class related then family and scale) and Campesinos (Farmers). In some of the literature the concept of Low-External-Input and Sustainable Agriculture (ELISA) farmers is used. Though not entirely synonymous they have a lot in common and are often used as such. Excluded are large scale (often, not always, highly industrialized) farms of rich landowners or businesses.
[4] *Agroecosystem* is defined by Gliessman (2000), as a site of agricultural production – a farm, for example – understood as an ecosystem. It could be defined to any scale although a farm or a field is most common (Altieri, 1995). The agroecosystem provides a framework with which to analyze food production systems as wholes, including their complex sets of inputs and outputs and the interconnections of their component parts (Gliessman, 2000).

2.1.2 How come it became important?

215.2.1. Indigenous Knowledge and Practice.

Indigenous people all over the world have a long history of using ecological principles as a way of managing their local resources to provide themselves with food, clothing, energy, building material etc (Hecht S.B., In: Altieri, 1995:1). This comprehensive and adapted knowledge has recently regained importance with the interest of scientists and NGOs amongst others (Hecht S.B., In: Altieri, 1995:4). But, for a long time it was undermined. Phenomena as the Catholic Inquisition, mission work, colonialism, and related slavery destroyed or altered the structure of many traditional societies and with them their production systems and ways of transferring local agronomic knowledge (Hecht S.B., In: Altieri, 1995:2).

2.1.2.2. From Subsistence to Commercial and Export Agriculture - mercantilization, modernization and Green Revolution.

The mercantilization system, which accompanied colonialism, turned the conquered continents to resource suppliers to international commerce (Hecht S.B., In: Altieri, 1995:3). A historical process started with the shift from mainly subsistence farming and local consumption, to commercial and export agriculture (Guzmán *et al* 2000:38-42). This process was enforced with the modernization of agriculture enhanced by formal research (Kathounian 2001:44).

Formal research has largely been focused on high agricultural potential areas and cost intensive technologies. This approach has failed to incorporate the specific conditions / needs of poorer smallholders[5] and hence not been able to produce directly applicable technologies for them (Sayer & Campbell, 2004; Reijntjes *et al.,* 1992). During the 1970s an attempt was made to develop advanced agricultural technologies for poor tropical countries and by that reduce hunger. This movement was called the *green revolution* and was conducted by 16 international research centers which where formed supported by the Consultative Group on International Agricultural Research (*CGIAR*) (Sayer & Campbell, 2004). The green revolution technologies where disseminated by a traditional *transfer of technology* model where scientists produce scientifically valid research results transferred to farmers by extensionists (Probst & Hagmann, 2003). These efforts averted large-scale famines by offering quick solutions to urgent needs but in many cases at the expense of human health, long-term degradation of; soils, water, biodiversity and non-cultivated land. The initial spectacular gains of the green revolution are hence unlikely to be maintained (Conway 1997). And threaten sustained production on agricultural land (Gliessman 2000:11f).

The diffusion of advanced agricultural technologies in combination with the transfer of technology model was successful in relatively homogenous, low-risk, natural and social environments, where farmers perceive the same kind of challenges and share a common set of

[5] The authors use the concept of Low-External-Input and Sustainable Agriculture (ELISA) farmers. However in this thesis the term smallholder or family farmers will be used. Those are the terms most commonly used in English and in Latin America respectively. Especially in this historical context the term ELISA farmers seem inappropriate since many small scale family farmers tried to use higher amount of external inputs and it would probably not be difficult to find several examples of non sustainable production systems. The term seems to be a parallel to ecological/agroecological farmers but without strict restrictions of using agricultural synthetic chemicals.

beliefs and values. The success in adoption of these techniques by smallholders in highly variable areas with low levels of control of growing conditions was limited (Probst & Hagmann, 2003). It mostly favored more prosperous farmers in areas of high agricultural potential areas, missing the poorest of the poor (Sayer & Campbell, 2004).

In Altieri (1995:16,33) it is explained that the Green Revolution strategy evolved when the problems of poverty and hunger were viewed primarily as problems of production. According to the author it was also the time, 1960s and 1970s, when the governments in Latin America were intensively engaged with policies favoring urban development. To support this kind of development cheap food was needed for the cities. The author then shows how strategies and policies thereby were directed where the production could be increased most efficiently; large and medium scale farms in areas of better quality soils and irrigated lands. The rural population mainly served as large reserve of cheap labor for urban-based industrial development. Altieri (1995:16) concludes that "in terms of raising output, it succeeded; at bottom it was part of a policy of betting consciously on the strong. It is now generally recognized that aggregate increases in food production alone will not overcome rural starvation and poverty, although it may reduce some urban food costs."

Gliessman (2000:10) shows how this affected small-holders: "Smaller farms cannot afford the cost of upgrading their farm equipment and technologies in order to compete successfully with the large farm operations. Moreover, the increase in the share of the food dollar going to distributions and marketers, coupled with cheap food policies that have kept farm prices relatively stable, has left many farmers in a tightening squeeze between production costs and marketing costs. Faced with such economic uncertainty, there is less incentive for farmers to stay on the land. One trend is for larger farmers to buy out their smaller neighbors" (Gliessman 2000:10).

Gliessman (2000:10f) also explains the impact of growing large-scale export agriculture: "Rural people – who were once able to feed themselves adequately and sell surplus food to city-dwellers – are pushed of the land [since they cannot compete with large-scale agriculture in the modernized version of agriculture], they migrate into cities, where they become dependent on others for their food. Since more of the food produced in the countryside is destined for export, increasing amounts of food for the expanding urban areas must be imported. Because of this dynamic, exports of food to developing countries increased five-fold between 1970 and 1990, threatening the food security of less-developed countries and making them even more dependent on developed countries."

This process has also a direct impact on the sustainability of agroecosystems. When farmers leave for town they take their profound knowledge of the local ecosystem with them. This knowledge is crucial to sustainable production and when not used, it disappears (Gliessman 2000:10). This so-called knowledge erosion can happen very fast, from one generation to another or even faster. Agriculture based on the global market and often technologies developed far from their place of application lack this local management knowledge based on ecological principles (Gliessman 2000). Instead purchased inputs requiring more capital, energy and non-renewable resources are used (Gliessman 2000). When the main purpose of agricultural systems of the developing countries is to export food to developed countries using inputs from the developed countries, only a small elite of rich landowners are benefited, while the poor loose their land and/or food security (Gliessman 2000:11).

This process is also true for Brazil were the agriculture based on the agrochemical model expanded strongly during the 70ties. Almost all agricultural science, education and extension were guided by this model. The military government subsidized pesticides and synthetic fertilizers for this production. This change of agricultural paradigm was so effective that in regions of Brazil were the model became dominant the farmers literally forgot how to produce in another way (Kathounian 2001:21,44).

2.1.2.3. The Reaction

These experiences and insights have contributed to the rise of NGOs, social movements, farmers unions and organizations that oppose to this kind of approach to agriculture and rural issues with accompanying technologies. They work for the *empowerment*[6] of the excluded ones, so their voices reach the public and work to find more sustainable and appropriate solutions for agriculture in general (e.g. Kathounian 2001:28, Schmitt 2003, Altieri 1995:33-35). This has taken various names in different parts of the world but a common name at the beginning of this process was alternative agriculture (e.g. Guzón 2006, Kathounian 2001:27). In Latin America this process has, with time, evolved into what is called the agroecological process (Guzón 2006, Kathounian 2001:28).

Another reaction is a research paradigm change. From about the 80ties and forward a more holistic, systemic and integrated[7] approach can be sensed (Kathounian 2001:59). This has taken different expressions one being agroecology, as a science. Agroecology as a science will be thoroughly described in chapters *2.4.1.2. Scientific world* and *2.4.2. Theory*. At this point it is enough with a loose definition of agroecology in a scientific context as an environmentally and socially sensitive approach to agriculture that sees the reality in the form of systems, where biological, technological and social systems are connected to each other in an inseparable way. The narrowest definition of agroecology, as a science, refers to the study of purely ecological phenomena within the crop field, as predator/pray relations, or crop/weed competition (Altieri 1995:4). The agroecological direction is very common in Latin America and close to the approach of NGOs. To a limited extent it is also present within scientific environments in the world (e.g. Altieri 1995, Gusmán *et al* 2000, Caporal & Costabeber 2004)

Another direction common within the international research centers and widely spread in the scientific environments of the world is Integrated Natural Resource Management (*INRM*), which has replaced the simple term agricultural production (Probst & Hagmann 2003). According to CGIARs (no year stated) definition it is: "An approach to research that aims at improving livelihoods, agroecosystems resilience, agricultural productivity and environmental services…It aims to augment social, physical, human, natural and financial capital. It does this by helping solve complex real-world problems affecting natural resources in agroecosystems."[8]

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[6] A simple explanation of the concepts e*mpowerment* for the purpose of this thesis is; gaining power over ones life.

[7] *Integrated approach* comes from integrate, which is the opposite to separate and means to bring things together to a whole.

[8] One comes across several terms in the academic world that goes in a similar direction. Sustainable Agriculture is sometimes used in this broad sense. In Holland the term Low-External-Input and Sustainable Agriculture is used (Reijntjes *et al* 1992). However it is not the aim of this study to perform a thorough review of terms used. It is enough to show that similar ideas under different names are spreading over the world.

To deal with all these issues in an integrated way and to include all stakeholder perspectives, the transfer of technology model is complemented or replaced with Participatory Research (PR) methodologies (Probst & Hagmann 2003, Sayer & Campbell 1994).

2.2. Brazil and Rio Grande do Sul

Brazil is a federal republic with 26 states (Brazilian Government) and 185.403.141 inhabitants (IBGEb). The states are divided into 5 regions; northwest, north, centraleast, southwest and south. Rio Grande do Sul is the southern most state and thereby belongs to the southern region together with the states of Santa Catarina and Paraná (Also see map in Appendix 1).

Brazil extends over 8 547 400 km^2 [9], 40 degrees of longitude. The topography is, in most parts, gentle and 93 % of the country is below 800 meters (FAO country profiles). The ecological zones extend from tropical to subtropical, temperate and even desert (FAO forestry). The year 1993 agriculture and livestock contributed to the national GNP with 8.5% Industry with 36.8% and services with 53.8% (IBGEb)

At the time of the first colonization of Rio Grande do Sul the area was inhabited by several indigenous groups e.g. Guarani and Kaigángi. Most of the indigenous groups in this area disappeared as a result of the territorial fights of the Portuguese and Spaniards. The Brazilian authorities contributed to this by forcing them further away from their lands. Today most of the remaining indigenous groups live in reserves (Gaudagnin 2000). I have also observed several camps along the highway. Apart from the Portuguese (luso brasileiros) and Africans Rio Grande do Sul was colonized mainly by Germans (from 1824 and forward) and Italians (from 1875 and forward) (e.g. Guadagnin 2000, Feldens 1989). I have mostly encountered Italian and Polish descendents but it seems to be generally known that descendents from several other European countries exist. According to Gaudagnin (2000) the Italians started to leave Italy at the end of the 19th century. At this time the country was strongly industrialized, making smallholding family agriculture difficult. The cities could not absorb the large amount of farmers and nothing was made to change their situation.

Feldens (1989) states that at the same time Rio Grande do Sul needed a work force to produce more food, replace the slaves and to exploit new territory. Propaganda was made to attract European farmers. The solution of the Italian farmers became the “promised land”, in their case, Brazil. First areas closer to the coast were colonized. At the start of the 20th century this land was no longer enough and new land further into the country became colonized (Gaudagnin 2000). The farmer groups that Cetap works with are all found within these new colonies.

Today Rio Grande do Sul is one of the riches states of Brazil with an important agricultural and livestock sector. The year 2005 Rio Grande do Sul had a population of about 10 750 000 inhabitants (IBGEa, FEEa). Calculations based on information from national statistical institutes (IBGEa, FEEa) show that the population has grown with 69.1% between 1940 and 2005. During the same time the rural population has decreased with 26.6% and the urban population increased with 88.6%. The largest changes in population have occurred from the 90s and forward. In 1995 Rio Grande do Sul had the fourth largest GNP of the country. Agriculture contributes to the state GNP with 11.5%, industry 44.5% and services with 44%. Important cash crops are; corn, rice, soy beans, manioc (or cassava), wheat, beans, tobacco,

[9] Compare to Europe’s 10,400,000km^2

potato, sugar cane, banana, onion, apples, oranges, grapes. Soya beans take up the far largest area followed by corn and then rice (FEEb).

2.3. (Smallholder) Family Agriculture

In Brazil agroecology is strongly associated with the concept family agriculture as opposed to "agricultura patronal" (understood as managed by a large landowner or business) (e.g. Khatounian 2001). Other common terms used in Brazil are; Agricultura Camponesa (political connotation, more class related then family and scale) (e.g. MPA 1995) and Agricultura Campesina (Farming, more politically neutral). In some of the literature the concept of Low-External-Input and Sustainable Agriculture (ELISA) is used (Reijintjes *et al. 1992*). In English the term smallholder is often used. Though not entirely synonymous they have a lot in common and are often used as such. In this thesis the term family- and smallholder agriculture will be used as synonyms.

Family agriculture is defined by the INCRA/FAO[10] (2000) as when "the producer has the control over the establishment, the workforce is mainly family based and the area of the property is under a regional maximal size" (my translation). For the southern region, including Rio Grande do Sul, this maximal size is determined to be 280,5 ha. Family agriculture farmers are also the public of Cetap. However, none of the farmers I met had a land area over 60 ha. As the definition suggests the concept family agriculture is thereby associated with small scale and a work force which is mainly family based. It should therefore not be confused with *family owned* large scale and/or highly industrialized agriculture.

To understand the reason for this division, it is necessary to remember the colonial history of Brazil with the distorted power relation between huge land owners and poor farmers. Some figures will help realize how this relationship is maintained until today but also the importance of family agriculture in Brazil.

According to a study made by INCRA and FAO (2000) about Brazilian family agriculture, the family agriculture farmers (smallholders) represent 85,2% of all farms. They use 30,5% of the total farm area and are responsible for 37,9% of the Gross National Agropecuarian Product (GNAP). At the same time they only receive 25,3% of government financing destined to agriculture. The southern region is the strongest one when it comes to family agriculture. Here it represents 90,5% of all farms or 907.635 farmers, using 43,8% of the total production area and produces 57,1% of the regional GNAP. However the small-holders in this region receive only 43,3% of government financing to agriculture.

Although only 21,9% of the family agriculture farms are located in the southern region and only use 18% of the total area they are responsible for 47,3% of the Gross National Product of Brazilian family agriculture. Also the agriculture subsidies used by small-holders are concentrated to this region (55%).

The area of family farms was 26 ha while the mean patronal farm was 433 ha. In the southern region this relationship is 21 to 283 ha. It should also be mentioned that 39,8% of Brazilian family farms were smaller than 5 ha and 87% were smaller than 50 ha.

[10] INCRA (Instituto Nacional de Colonização e Reforma Agraria) is Brazils National Insititute for Colonization and Agricultural Reform. FAO is the Food and Agriculture Organization of the UN.

The mean total income (TI)[11] per family farm in Brazil[12] was 1269 US Dollars/year (R$ 2717), and 2406 US Dollars/year (R$ 5152) in the southern region. The mean monetary income (MI) per family farm was 873 US Dollars/year in Brazil (R$ 1783) and 1549 US Dollars (R$ 3315) in the southern region. The mean yearly total income per patronal farm in Brazil was 8915 US Dollars (R$ 19085) and 13153 US Dollars (R$ 28158) in the southern region.

The Total Income (TI) per hectare shows that the family agriculture is much more efficient than the patronal. It produces an average of 49 US Dollars/ha/year (R$ 104) compared to the patronal 21 US dollars/ha/year (R$ 44). In the southern region the relation is 113 to 46 US Dollars/ha/year (R$ 241 to 99). Family agriculture creates 79,9% of all work opportunities in the Brazilian country side. In the southern region it stands for 84%.

Small-holders produce (southern region within parenthesis) 24% (35%) of total cattle GNP, 52% (80%) of total milk, 58% (69%) of all swine and 40% (61% of poultry) of all poultry and eggs, 33% (59%) cotton, 31% rice, 72% (92%) onion, 67% (80%) beans, 97% (98%) tobacco, 84% (89%) manioc, 49% (65%) corn, 32% (51%) soy beans, 46% (49%) wheat, 58% (83%) banana, 27% orange, 47% (81%) grapes, 25% (43%) coffee and 10% sugar cane.

Family agriculture is therefore a major food producer for its internal market. It is the far largest employer in rural areas and by that avoiding urbanization to overcrowded cities with high unemployment. The small-holders are the main actors in maintaining water resources, biodiversity and a rich national cultural manifestation (INCRA/FAO 2000).

2.4. Agroecology

2.4.1. The Origin

2.4.1.1. Indigenous Knowledge

In chapter *2.1. Historical Background to the Development of Agroecology* it was shown how agroecology surged at the end of the 70s as an answer to the first manifestations of the ecological, economical and social crisis of conventional agriculture. But we must not forget that the agricultural practices of agroecology is to a large extent a rediscovery or written formulation (with scientific conventional language) of much of the knowledge that farming cultures have possessed for a long time (Guzmán *et al* 2000:81).

Researchers document and investigate indigenous agricultural systems and then experiment with them in order to find western scientific explanations (Altieri 1995:13-15). As researchers explore indigenous agriculture, it is increasingly apparent that many locally developed agricultural systems routinely incorporate mechanisms to accommodate crops to the variability of the natural environment and to protect them from predation and competition (Altieri 1995:1). These mechanisms make use of regionally available renewable inputs and ecological and structural features of the agricultural field, fallows, and surrounding vegetation (*ibid*).

[11] Including products for own consumption.
[12] Converted to present value (January 2007) in US Dollars.

2.4.1.2. The Scientific World

Several authors have shown that works which associate ecology and agronomy have been published since the 1920s (e.g. Gliessman 2000:15, Altieri 1995:7-8). But the boom for the term *agroecology* did not come until the 1970s (Guzmán *et al* 2000:81-82). At the beginning agroecology meant investigating phenomenon's as the relation between weeds, pests and crops and the impact of climate and soil (*ibid*). With time it was amplified to include a conception of the agrarian activities as part of a wider environment, as socially balanced and more preoccupied with the long term sustainability (*ibid*). It was not until the 80s that social factors were seen as very relevant factors (*ibid*).

In Altieri (1995:7) the agroecology of today is described as "an approach that integrates the ideas and methods of several subfields, rather than as a specific discipline. Agroecology can be a normative challenge to existing ways of approaching agricultural issues in several disciplines. It has roots in the agricultural sciences, in the environmental movement, in ecology (particularly in the explosion of research on tropical ecosystems), in the analysis of indigenous agroecosystems, and in rural development studies. Each of these areas of inquiry has quite different aims and methodologies, yet taken together, they have all been legitimate and important influences on agroecological thought".

Three areas within ecology have been particularly critical in the development of agroecological analyses; nutrient cycling, pest/plant interactions and succession.

2.4.1.3. Social and Environmental Movements

Kathounian (2001:28) explains that parallel with the scientific evolution of agroecology, an agroecological movement was rising from environmental and social movements as well as NGOs in Latin America. The movement arose from the need to simultaneously preserve the environment and to empower the smallholders (*ibid*). The farmers were facing political exclusion and needed to strengthen their political significance as well as improve their socio-economical reality (*ibid*). This movement influenced agroecology giving it a critical perspective against the scientific, technical rationality and more concretely against conventional agriculture (Guzmán *et al* 2000:82).

The development of the new ecological thinking and environmental ethic gave agroecology its ethical and philosophical foundation, with a transforming vocation as a tool to analyze and organize a more sustainable agricultural future (Guzmán *et al* 2000:82). Altieri (1995:10-11) explains how the movement took a critical stance toward production oriented agronomy, and increased the sensitivity to a broad range of resource issues. According to the author pollution by synthetic chemicals was the initial concern. Soon issues of energy and material use became important, especially after the oil prices skyrocketed in the early 1970s. Hence, according to the author, resource efficiency became a criterion. Altieri continues by showing how other issues motivated the movement; in the third world the agricultural inputs are often imported and strain the international balance of payments and debt situation of many developing countries. Further, because food crops do not receive most of these inputs, production gains may not translate into a better food supply. Finally the author states that the movements protested against the social consequences of this model having complex and often extremely negative impacts on local populations, particularly those with limited access to land and credit.

Increasingly, researcher began to comment on the poor "fit" between First World land use approaches and Third World realities (Altieri 1995:11-12). It was a challenge to agricultural

researchers to rethink the ecology of tropical agriculture (*ibid*). In situations where farmers and nations were constrained by resources, where regressive distributional structures prevailed, and where temperate zone approaches were often inappropriate for local environmental conditions, the agroecological approach seemed particularly relevant (*ibid*).

2.4.2. Theory

According to Altieri (1995:22) conventional agricultural scientists have long realized that their agricultural technologies have problems. The author mentions how various methods have been employed to try to solve these problems. Special extensionists were employed to extend the technologies to the farmers in order to bridge the gap between scientists and farmers. Integrated packages of technologies that fitted together were designed. Even on farm research was tried. But all attempts have according to Altieri been moderately successful in overcoming the problem, because the problems are inherent to the philosophical premises of their methods and practices. To make the premises explicit Altieri puts up a table containing the dominant premises of the modern science against examples of alternative premises (table 5).

Table 1. Dominant premises of modern science and alternatives

Dominant premises	Alternative premises
ATOMISM Systems consist of unchanging parts and are simply the sum of their parts	HOLISM Parts cannot be understood apart from their wholes and wholes are different from the sum of their parts. Parts might evolve new characteristics or totally new parts can arise.
MECHANISM Relationships between parts are fixed, systems move smoothly from one equilibrium to another, and changes are reversible.	Systems might be mechanical, but they might also be deterministic yet not predictable or smooth because they are chaotic or simply very discontinuous. Systems can also be evolutionary.
UNIVERSALISM Diverse, complex phenomena are the result of underlying universal principles which are few in number and unchanging over time and space.	CONTEXTUALISM Phenomena are contingent upon a large number of factors particular to the time and place. Similar phenomena might well occur in different times and places due to widely different factors.
OBJECTIVISM We can stand apart from what we are trying to understand	SUBJECTIVISM Social and most "natural" systems cannot be understood apart from our activities, our values, and how we have understood and hence acted upon theses systems in the past.
MONISM our separate individual ways of understanding complex systems are merging into a coherent whole.	PLURALISM Complex systems can only be known through multiple, different patterns of thinking, each of which is necessarily a simplification of reality. Different patterns are inherently incongruent.

Altieri (1995:24) believes that the problem is not the premises in themselves; they have facilitated a level of prediction and control beyond that known before. But the fact that they have been so dominating and not admitted any other patterns of understanding has resulted in long-term and systemic consequences for people and for agroecosystems which might have

been foreseen, ameliorated, or avoided. According to Altieri a difference between conventional and agroecological scientists is that agroeologists as a whole tend to be more methodologically pluralistic.

2.4.2.1. Coevolution

An agroecologist sees the agrarian system as a simplified ecosystem modified by man. Over time the natural processes have resulted in a specific kind of climate, soil, vegetation and fauna (Guzmán *et al* 2000:96). Humans have learnt to artificially reproduce ecosystem function to grow food and material they need (Guzmán *et al* 2000:86-87). The difference between natural ecosystems and artificial agroecosystems is that the former have the capacity of self-maintenance, self-repairing and auto-reproduction while the systems manipulated by man are unstable need external energy and material for their maintenance and reproduction (*ibid*).

If humans have succeeded in managing the agroecosystems with respect for the mechanism by which nature renews itself, or not, have depended on their social systems. Altieri (1995:25-26) divides the social system into sub-systems of knowledge, values, technology, and organization. All these systems including the natural one have affected each other over time in a mutual process of coevolution (*ibid*). Thus everything is coupled, yet everything is constantly changing and this is thereby a local specific process.

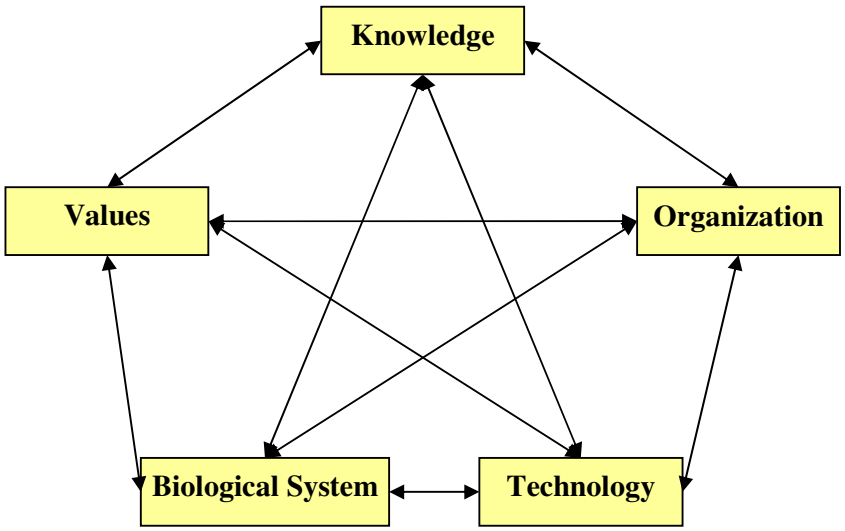

Figure 1. The coevolutionary relationships according to Altieri (1995:25-26)

The concept of agroecosystem possess a holistic nature, demanding a systemic, multiple, historical, sociological and anthropological analysis as well as an analysis of the circulation of the material and energy flows and the forms of consumption and degradation (Guzmán *et al* 2000:96)

For a long time the coevolutionary knowledge of farmers was not seen as relevant or valid. If a technology did not work it was the farmers fault or due to bad infrastructure associated

issues (Altieri 1995:17). Never was the technology itself criticized. Many field researchers and development practitioners thought this was wrong, meaning that the technologies themselves required substantial re-evaluation and that the farmer's decision to adopt a technology is the true test of its quality (*ibid*).

Altieri (1995:15) concludes that "applied agricultural research cannot begin in isolation out on the research station or with a planning committee out of touch with farm conditions. In practice this means obtaining information about and understanding the farmer's perception of the problem and accepting farmer's evaluation of the solution."

The coevolutionary process puts people and how people think inside of the process and thereby gives legitimacy to the cultural and experimental knowledge of farmers (Altieri 1995:26). Their ways of understanding may not translate into scientific ways of understanding, but how and what they understand has proven fit with their system and can be used to help understand that system (*ibid*). This provides strong philosophical basis for participatory research, for the incorporation of farmers in the research process, a technique increasingly being used by agroecologists (*ibid*).

Altieri (1993:26) states that one can design better agricultural technologies if one is aware of how they might interact with other systems, but the complexities of such interactions suggest that scientists might better think of themselves as experimenters who might affect and accelerate the coevolutionary process by introducing multiple mutations, only some of which will prove fit.

2.4.3. Strategy – Of Adapted Agroecology

In Guzmán *et al* (2000:97-98) it is stated that agroecology is not only a different focus with which we can study the agroecosystems. It also pretends to create an alternative and efficient strategy to solve the enormous problems that the current capital intensive model of agriculture is creating. This applied part of agroecology pretends the sustainable management of, and egalitarian access to the natural resources.

Kathounian (2001:44-45) shows the difference in approach between the Green Revolution agriculture and agroecology. The Green Revolution sedimented a logic were to each problem there is *one* corresponding solution; for each pest a pesticide, for each mineral deficiency a nutrient, for soil compaction there is tilling With an agroecological approach a pest outbreak can simultaneously be associated to the climate conditions, the mineral fertilization, the monoculture, the compaction of the soil, the destruction of the natural habitats etc. The author states that unfortunately the Green Revolution mentality still dominates amongst many of the farmers and agricultural actors.

According to Kathounian (2001:45) these different approaches lead to different management strategies. In agroecology the vast majority of the techniques for pest and disease control as well as fertility management are *preventive, unspecific and process oriented*. In the conventional model most techniques are *curative, specific and product or operation oriented.*

2.4.3.1. Sustainability

What then should guide the search for sustainable agroecosystems? The most famous sustainability definition is that of the Brundtland report (1987:54): "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Guzmán *et al* (2000:98) states that many have tried to

concretize this definition but most attempts are too general and imprecise. The author claims that UN tries to popularize the term without putting it in contradiction to economical growth.

But, according to Guzmán *et al* (2000:98), the economical growth (or agrarian in our case) is by definition unsustainable. For there to be growth, that is a more or less continuous increase of the physical base of the economy, there should be a technological level that would allow us to recycle all material on earth without any loss and only use renewable energy. Guzmán *et al* write that independently of the technological pessimism or optimism that we profess we have to acknowledge that to this day that hypothesis is, just that, a hypothesis. At the mean time the exhaustion of the natural resource base and the deterioration of the environmental functions are scientifically verifiable and in many cases, very close (Guzmán *et al* 2000:98).

We then need to put forward a more concrete definition of sustainability that can be useful in agroecological contexts. The following table is a compilation of the contribution of several sources to this definition (table 6.)

Table 2. Definition of Sustainable. Compilation of several authors.

Environmentally sensitive	***Ecologically sane***: maintaining the quantity and quality of natural resources and the vitality of the agroecosystem as a whole. ***Stability:*** the capacity of an agroecosystem to stay in a stable state of a dynamical equilibrium over time. To be capable of fighting the diminishing returns without the need of adding increasing quantities of energy and nutrients. ***Resilience****:* to be capable of maintaining the capacity of productivity after suffering serious disturbances as a fire, inundation, a drastic fall in prices of one of the crops etc. ***Autonomy****:* the level of integration of the agroecosystems. Reflecting the movement of energy, material and information between its various components and the system as a whole as well as between this and its external environment. And most of all the level of control that one has over that movement. (Guzmán *et al* 2000:101-104)
Economically viable	Securing the access to means of life for all farmers (Guzmán *et al* 2000:101-104) meaning; land, resources and knowledge to produce food for own consumption as well as access to market and an income (Embrapa 2006, Altieri 1995:146). This is also closely related to the *stability* under the first point; environmentally sensitive.
Socially just,	Empowerment of local communities and the effective participation of the rural poor in the development process (Altieri 1995:146). The access to land, natural resources and

	technical assistance should be distributed so that all basic needs of all present and future members of society should be met (Guzmán *et al* 2000:101-104, Altieri 1995:147).
Political	An organized movement for the transition (Embrapa 2006, MPA 2005).
Culturally Sensible and Ethical	Respect for local traditional cultures (Embrapa 2006) and all forms of life (Cetap 2006b, Khatounian 2001:42). Preserving values as confidence, honesty, responsibility, precaution, self-respect, cooperation, solidarity and compassion (Cetap 2006a, farmers' interviews from this study).
Adaptability	The resilience of the agroecosystem when confronting the social and natural changes of the production: a prolonged time of drought, different agricultural politics, changing demands of the market, innovations and new technological patterns etc (Guzmán *et al* 2000:101-104).

Guzmán *et al* (2000:104-105) suggest that the following criteria, originally proposed by Gliessman, should be used to analyze and evaluate the sustainability of the agroecosystem;

a) The level of dependency on external inputs; energy, material or information. The lower the dependency and the higher the self-sufficiency the larger the level of autonomy and self-dependency of the system.
b) The level of use of renewable resources which are also locally accessible. In addition to reducing the external dependency, the renewability assures the duration of the favorable conditions that make the production possible.
c) Accepting and/or tolerating the local conditions and adapting to them facilitate sustainability. This diminishes the fragility of the system when it is exposed to intensive modifications of the environmental conditions.
d) Sustainability is also dependent on the productive capacity of the ecosystem. This should not be confused with its ability to obtain the maximum production and productivity. The ecological and economic optimums do not necessarily have to agree with each other.
e) As the use of the beneficial impacts of the environment is increased so is the sustainability. Environmental heterogeneity facilitates this in a much larger extent than homogenous environments, which are simplified. The higher the extent to which synergisms and complementarities are taken advantage of, the more sustainable the system. An example could be combining crops, trees and animals in different spatial and temporal arrangements.
f) The self-maintenance and auto-reproduction capacity of natural ecosystems depend on their level of biodiversity. Similarly, the capacity of an agroecosystem to prevail over time increases with its biological and cultural diversity.
g) It is equally fundamental that the farmers managing the agroecosystem dispose of a knowledge adapted to its specific conditions and that they are able to control and develop it. The sustainability increases if the knowledge and culture of the local people is used.

h) Finally, the access to sufficient amount of products for internal supply as well as for acquisition – by means of exportation- of other necessary goods and services is fundamental for the prevalence of the system. This is related to the natural productivity of the agroecosystem but also to the agronomic practices, the social situation it find itself in as well as to an adequate number of people it supports.

2.4.3.2. The Principles

The agricultural practices of agroecology are nurtured by different schools of ecological growing (Embrapa 2006) as; organic, ecological, permaculture, biodynamic and natural agriculture (Khatounian 2001:25-32). Although the practices have different origin they are all guided by three principles that are given importance within agroecology; (bio)diversity, material and energy recycling and natural biological control (Guzmán *et al* 2000:202).

2.4.3.2.1 (Bio)diversity

Biodiversity is one of the basic component or elements of an agroecosystem (Guzmán *et al* 2000:203). It develops multiple functions and subsidizes the functioning of the agroecosystem by providing it with ecological services as nutrient recycling, erosion control, infiltration of water, maintaining humidity and biological control of pests and diseases (*ibid*). From this point of view agroecology explore the complementarities and synergisms that surge when crops, trees and animals are combined in different spatial and temporal arrangements (*ibid*).

Diversification is not only an ecological advantage. It also gives economical stability both to farms and larger regions (Kathounian 2001:40). When talking to Cetap and the farmers it becomes obvious that diversity has a huge role to play. It gives not only food security but also high quality food. It is a commercialization strategy since diversity attracts and it permits the farmers to always have something to harvest and sell, independently of the conditions. It is not only important for food but also for clothing, medicine, art, entertainment, religious ceremonies and to maintain a rich culture associated to this diversity. When diversity disappears so does the culture.

Diversification should be functional but also needs to be administrable. In other words, you should not just diversify but diversify functionally and within the boundaries of what can be administrated (Kathounian 2001:40). When e.g. climatic variations harm some species, unharmed competitors increase (Stiling 1992). This suggests that a planned and directed biodiversity, functional diversity, could favor desired species (Bugg & Picket 1998). No general characteristic exist that can be used to construct pest suppressive crop mixtures. Rather, each potential combination of crops must be evaluated in the local environment to determine if it is of value in light of specific crops, their pests and natural enemies (Shehan 1986).

2.4.3.2.2. Recycling of Energy and Materials

Agroecology propose the use of renewable and clean energies as well as the reutilization and recycling of nutrients and materials within the agroecosystem (Guzmán et al 2000:203). Ideally the agroecosystem should be managed so that no garbage or sub products would exist, but every material produced would become an input for some other activity (Kathounian 2001:40). This is where the internal integration, self-maintenance and renewability of the agroecosystem mentioned earlier fits in. Examples of agricultural practices that enhance this are (Altieri 1995:92);

a) Regular supply of organic matter through regular addition of organic matter (manure, compost) and promotion of soil biotic activity.
b) Nutrient cycling mechanisms through the use of crop rotations, crop/livestock mixed systems, agroforestry and intercropping systems based on legumes, and so forth.

2.4.3.2.3. Natural (Conservation) Biological Control – an integrated approach

Within agroecology there is an integrated approach to the control of pests and diseases. It is sometimes seen as a consequence of the two earlier principles (Guzmán *et al* 2000:204). When a farm or agroecosystem is created with the natural ecosystems as a model then an ecological infrastructure based on biodiversity is constructed (*ibid*). A way of increasing biodiversity in an agroecological system is by intercropping. There are several hypotheses explaining why pests decrease in more diversified systems. Miguel A. Altieri (1994) refers for example to Root's *enemy's hypothesis* where a more stable natural enemy population can persist in polyculture due to the more variable and continuous availability of food sources and microhabitats. Many times, in monocultures, predators and parasitoids drive their prey or host populations to extinction and become extinct themselves shortly thereafter. Prey or host populations will re-colonize these monocultures and rapidly increase (Altieri 1994). Root's second hypothesis *the resource concentration hypothesis* argues that it is easier for an herbivore to find his host plant in a monoculture than in polyculture. The colonization is improved and it stays longer (moves less) in the field. Also, the reproduction is facilitated in a monoculture. Finch and Collier (2000) mean that physical obstacles and the confusing mixture of chemical and visual stimuli in a diversified system will make it more difficult for a herbivore to localize its host plant.

But there are other mechanisms of natural biological control. A high biological activity in the soil due to the biodiversity and the recycling allows the development of disease suppressive soils (Guzmán *et al* 2000:204). According to the trophobiosis theory of Chaboussou (1987) a plant exposed to pesticides changes its biochemistry making it more propone to the multiplication of pests and diseases. The author also shows that a balanced nutrition and good growing conditions have the inverse effect. In agroecology this is assured through recycling of organic material and abandonment of pesticides (Guzmán *et al* 2000:204).

2.5. Transition

The agroecological transition can be said to occur on different scales; farm, community, region, country and world wide (Guzmán *et al* 2000:199). For the purposes of this study the scale has been defined by a social organization, namely the ecological groups that cooperate with Cetap. Embrapa (2006) has defined the transition as *internal* and *external to the productive system;*

Internal transition:
- Reduction and rationalization of chemical inputs.
- Substitution of inputs.
- Biodiversity management and redesign of the productive systems.

External transition:
- Expanding the public conscience.

- Organizing the markets and infrastructures.
- Institutional changes (science, education, extension).
- The formulation of public policies that are integrated, systemic and under social control. These policies should be generated together with conscious and propositive social organizations.

In literature little is written about the external agroecological transition but quite a lot about the internal one. The three basic steps of the internal transition have been described by several authors (e.g. Gliessman 2000:304, Guzmán *et al* 2000:204). The steps described by Gliessman (2000) focus not only on inputs but also the practices;

1. Increase the efficiency of conventional practices in order to reduce the use and consumption of costly, scarce or environmentally damaging inputs.
2. Substitute conventional inputs and practices with alternative practices.
3. Redesign the agroecosystem so that it functions on the basis of a new set of ecological processes.

The alternative practices and redesign of the agroecosystem should be based on the principles mentioned earlier. Guzmán *et al* (2000:204-205) points out that the manner in which these steps are introduced depend on several factors. According to the author many times all pesticides are eliminated drastically to be able to sell on the ecological market. On the other hand, the author explains that often the conversion stops at the phase of substituting the inputs and never reaches the redesign of the system. This is thought to be due to the high costs its sometimes requires (new machinery and installations) but also because going from monocrop to polyculture requires a lot of new management knowledge and implies a risk. This is why Guzmán *et al* (2000:205) propose that public policy should support conversion initiatives and help finance it.

According to some experiences made by families within the Cetap groups in the Alto Uruguai region, the best results are reached when step 1 and 2 are almost immediate and the focus lies on an early redesign of the system. However the Cetap crew of that region emphasizes that this will depend on the individual situation that the farm encounters itself in at the start of the transition. This is in accordance with Kathounian (2001:288-291) who proposes an initial diagnosis of the natural and social situation of the farm. This should be followed by a visualization of where the farm family wishes to reach. When the point of departure and the point of arrival are defined the way from one point to another should be decided. The author suggests that a quite detailed plan of possible and desirable changes should be made for the first years.

From a *legal and commercial* point of view the transition is accomplished when no synthetic chemicals can be traced on the products to be commercialized, normally involving a period of 1-3 years without pesticide use (Guzmán *et al* 2000:200). However from an ecological point of view it could take a lot more time. The time for the eco-system of the soil to adapt to a new equilibrium could take up to 20 years (*ibid*). Depending on the interest of the ones involved, the transition can have different horizons. It could imply everything from a simple accomplishment of ecological commercialization rules, or substitution of inputs, to the creation of truly sustainable agroecosystems (Kathounian 2001:285).

Chapter 3. The Choice of Methodology and Research Process Used.

The focus of the study is to *understand and hopefully improve a complex reality with all its variation in perceptions.* For this purpose the positivistic approach to science was found inappropriate. In positivistic science one works with quantifiable and objective fact were all other variables than the observed are excluded or under control (e.g. Thurén 1991:14 *ff*, Kvale 1996:61 *ff*). The aim of this study was not to find objective facts but to understand the different perspectives of the actors. It was also not the idea to look at single variable or pieces of reality, which would be impossible to isolate in a complex real life situation. It would also not show the interaction between the different parts and their role in a bigger picture. Instead the focus would be at the complexity of the situation and the interactions. Finally a deep understanding of the situation was sought and not quantitative facts and statistics.

To reach this profound understanding of the situation, *as experienced by the participants*, a Soft System Methodology (SSM) was chosen. SSM is a research process made up of several steps to facilitate the structuring and analysis of a complex reality when the focus lies on the various perspectives of the participants. That is, what we do every day, trying to understand our social environment, but in a more structured way. The participation implies not only to pass on information but also to analyze the situation, and to create suggestions for change.

The choice of a methodology does not only depend on the research question or the situation to be investigated. It also depends on the scientific theory that the researcher choose to follow. Scientific theory explains how the nature of our reality is believed to be (ontology) and how we believe that we can come to know about our reality (epistemology) (Sriskandarajah & Bawden 1994). Before going into the methodology and research process of this bachelor thesis, an effort will be made to make the scientific theory behind it explicit.

3.1. Theory

In this section the philosophic and scientific theory supporting the chosen methodology will be presented. It will sometimes be compared to the positivistic approach since this is the approach most commonly thought of when science is mentioned.

3.1.1. Postmodern Constructivism

3.1.1.1 Ontology

The study is guided by a postmodern constructivist theory. Kvale (1996:41-46) explains that within postmodern constructivist thought it is believed that there is no one objective truth or reality because the reality is a social construction. According to the author this means that knowledge is not a mirror of reality but an interpretation and negotiation of the meaning of the social world. Different meanings are given to reality depending on local context, the viewpoint and values of the investigator (*ibid*).

3.1.1.2 Epistemology

The nature of knowledge is thereby, intersubjective. It is created when people inter-relate or interact (Kvale 1996;45). Knowledge is understood as the same as the ability to perform effective actions (Kvale 1996:41-42). This is very similar to the view of psychoanalysis where it is believed that "although understanding can lead to change… the fundamental understanding of a phenomenon can first be obtained by attempting to change the

phenomenon." (Kvale 1996:77). In order to make sense of the concept of intersubjectivity a distinction has to be made between qualitative and quantitative research when addressing the social issues in a research project.

Kvale (1996:10) states that: "Qualitative methods are not merely some new, soft technology added to the existing arsenal of the social sciences. Rather, the mode of understanding implied by qualitative research involves alternative conceptions of social knowledge, of meaning, reality and truth in social science research. The basic subject matter is no longer objective data to be quantified, but meaningful relations to be interpreted… The subjects not only answer questions prepared by an expert, but themselves formulate in a dialogue their own conceptions of their lived world."

According to Holliday (2002:5) quantitative and qualitative methods belong to different paradigms, they origin from different epistemologies. He explains that in quantitative research it is believed that one objective reality exists and that it can be measured with the right instruments. This, the author calls a normative view of reality. The author continues to explain that it is related to the positivistic school in scientific theory where truth is believed to be found by following general rules of method that are largely independent of the content and context of the investigation. Any influences by the person of the researcher should be eliminated or minimized (Kvale 1996:61).

However there is also a view of qualitative and quantitative methods as tools and not paradigms (Kvale 1996:69). In the field work of this study only qualitative methods have been used. However quantitative methods would have been accepted if needed and would then have been seen as a tool within a constructivist paradigm. Many mainly quantitative studies use qualitative methods but they disappear in the reports where focus is placed on the quantitative results (Kvale 1996:69).

While qualitative researchers have an interpretative view (Kvale 1996:61), and thereby belong to the *hermeneutic school*[13] (Thurén 1991). They believe that researchers can only explore, catch glimpses, illuminate and then try to interpret bits of reality (Kvale 1996:61). The following table, taken from Holliday (2002:6 table 1.1) shows the differences between the two paradigms:

Table 3. Two Paradigms

Quantitative research	**Qualitative research**
Activities	
i) Counts occurrences across a large population	a) Looks deep into the quality of social life.
ii) Uses statistics and replicability to validate generalization from survey samples and experiments	b) Locates the study within particular setting which provide opportunities for exploring all possible social variables; and set manageable boundaries
iii) Attempts to reduce contaminating social variables.	c) Initial foray into the social setting leads to further, more informed exploration as

[13] Within the Hermaneutic school it is believed that we learn about our world by interpretation (Thurén1991:45).

		themes and focuses emerge
Beliefs		
iv)	Conviction about what it is important to look for	d) Conviction that what it is important to look for will emerge.
v)	Confidence in established research instruments.	
vi)	Reality is not so problematic if the research instruments are adequate; and conclusive results are feasible.	e) Confidence in an ability to devise research procedures to fit the situation and the nature of the people in it, as they are revealed.
		f) Reality contains mysteries to which the researcher must submit, and can do no more than interpret.
Steps		
vii)	First decide the research focus (e.g. testing a specific hypothesis)	g) Decide the subject is interesting (e.g. in its own right, or because it represents an area of interest)
viii)	Then devise research instruments (e.g. survey questionnaire or experiment)	h) Explore the subject.
ix)	Then approach the subject.	i) Let focus and themes emerge.
		j) Devise research instruments during process (e.g. observation or interview)
Rigour		
x)	Disciplined application of established rules for statistics, experiment and survey design.	k) Principled development of research strategy to suit the scenario being studied as it is revealed.

In qualitative research objectivity, as knowledge free of human impact, is denied (Holliday 2002:7). Researcher cannot help being socially located persons. Researchers cannot put themselves above other people. They must struggle as people to interact with people (Holliday 2002:10). The knowledge obtained will be produced nor objectively nor subjectively, but by intersubjective interaction (Kvale 1996;66). According to Walford (1999) in Holliday (2002:7) qualitative researchers have also contributed to an illusion of objectivity in previous years by making their procedures appear straighter forward than they really are. Research needs to be accompanied by accounts of how it was really done (*ibid*). The author states that this is the way to validate qualitative research and gives a illustrative comparison: "It can be compared to solving a math problem. One is not allowed to just give the right answer but has to show all the steps taken to get there". In table 2, after Holliday (2002:8 table 1.2), the different sources of validity in quantitative and qualitative research are shown.

Table 4. Source of Validity (Holliday 2002:8 table 1.2)

Quantitative research	Qualitative research
Need to tell the reader of the research: a) details of the population (in sample) b) what sort of questions (in survey questionnaires) c) which statistics d) the composition of groups (in experiments) e) which variable are being included and excluded. f) what groups are exposed to in experiments.	**Need to tell the reader of the research reasons for:** a) choice of social setting. - how it represents the research topic in its role in society. - how feasible (e.g. access) - how substantial (e.g. duration, depth, breadth) b) choice of research activities - how they suit the social setting - how appropriate to researcher-subject relationships - how they form coherent strategy c) choice of themes and focuses - how they emerged - why they emerged - Why they are significant - How far they are representative of the social setting Overall need to articulate a judicious balance between opportunism and principle.

In Kvale (1996:59 ff) it is stated that within the positivistic, quantitative tradition, this way of validitizing is often rejected. Validity, according to a positivist, is obtained if the findings can be generalizable. Kvale (1996:60) means that the positivist tradition is still so dominant in our western society that many people define science as generalizable knowledge, however, a different broader definition of science exist: "the methodological production of new, systematic knowledge."

Holliday (2002:2-4) explains some practical aspects of the two research paradigms: quantitative research concerns counting and can be made by survey or experiment. Holliday states that there are well known problems with questionnaires – how the mode of questions influences the mode or response, how far people tell the "truth", how far they understand the questions anyway, how far the social impact of a questionnaire will influence perception. In experiments a lot of effort is made to reduce the effect of variables other than that of interest. The overall aim is to control so that the experiment can be replicated with different groups to test the hypothesis time and time again. However the author believes that this will always be

difficult since subjects would need to be isolated from all other influences if contamination were to be totally prevented.

When establishing a research question qualitative research does not conjure the same type of precision required by quantitative research: rather than trying to reduce the uncontrollable social variables, qualitative research investigates them directly (Holliday 2002:30). It is assumed that it is as important to discover how research subjects feel about the information they provide as about the information itself (Holliday 2002:4). Indeed, the subjects are seen more as participants than subjects (*ibid*).

Holliday (2002:44) also raises some questions concerning the research setting. According to the author the research setting is at least partly in the mind of the researcher. In actuality the social world is a seamless mélange of complex behaviors. The researcher does not presume to define, *a priori,* the social world……humble in the face of its complexity. Holliday explains that the defining of a particular social setting involves taking a section of this mélange and drawing an operational boundary around it. Producing rather than testing hypotheses is more often the outcome of qualitative research (Holliday 2002:35). It is important to remember that even a positivistic hypothesis is based on the researcher's preconceptions (Thurén 1997).

The project will be guided by a progressive qualitative view as opposed to naturalist qualitative. In Holliday (2002:20) it is explained that progressivist criticize naturalist for overlooking inevitable ideological and cultural influences on the research process, actually believing that it is possible to minimize observer effect and see a virgin setting "like it is" without biasing preconceptions or theoretical prejudices. The author claims that confusion is caused since a positivistic, quantitative view on validity is carried over to the qualitative domain by the naturalists.

3.1.4. Systems Thinking

The chosen methodology has its origin within systems thinking. Systems thinking emerged around 1920's as a reaction against a reductionist thinking where it is believed that things can be broken down to their parts and analyzed separately in order to understand them (King 2000). By just summing up the parts to a whole the relationship between these parts and the emergent properties of the whole was not accounted for (King 2000). Within systemic thinking a holistic view is taken where it is believed that: "nature [and society] as a whole is intrinsically different from just the sum of its parts, that it has to be considered as a single entity. Any change in one part of nature, will have significant impact, not only on other parts, but also on the system as a whole." (Sriskandarajah & Bawden 1994)

Ison, et al. (1997) in King (2000) makes the following statements about Soft Analysis and Synthesis:

- "Systems analysis and synthesis seeks to reveal the different and sometimes conflicting perspectives of stakeholders and to show that the many different ways of viewing a situation can be rational."

- "The process leads to problem formulation rather than problem identification and prepares the ground for mutual understanding and negotiation of the problem(s) in question."

- "In this process, the researchers position themselves as actors rather than as objective dispassionate observers. [Since] The assumption that an external, objective position is possible allows researchers to avoid responsibility for the results of their research outcomes."

- "The assumption that researchers have an ethical responsibility to acknowledge their role in bringing about change allows researchers to be accountable for research outcomes."

3.2. Soft Systems Methodology

The following explanation of the Soft Systems Methodology (SSM) based on Soft Systems Thinking is taken from Naughton (1984) if not stated otherwise. This is a research process made up of several steps (table 3) to facilitate the analysis of a complex situation. Checkland (1994) explains that its theoretical basis comes from system thinking and business management. It belongs, according to Checkland, to the more recent "soft" systems thinking, especially on Geoffrey Vickers work on the theory of appreciative systems and the SSM can be seen as a way of making practical use of Vickers concepts. The methodology was mainly developed by Checkland (King 2000).

The intention is to find ways of improving the situation. Often the inquiry does not start with a clearly defined problem but with a complex situation, a mess, in which someone thinks problems may reside. Even if there seems to be a clearly defined problem the researcher will normally want to get to know the situation from an ample perspective. The basic idea is that every problem exists in a context, and that context may be perceived differently by different people. The participation of the persons involved in the situation is crucial. This participation implies not only giving information but also participating in analysis and in the proposal of desirable and feasible changes.

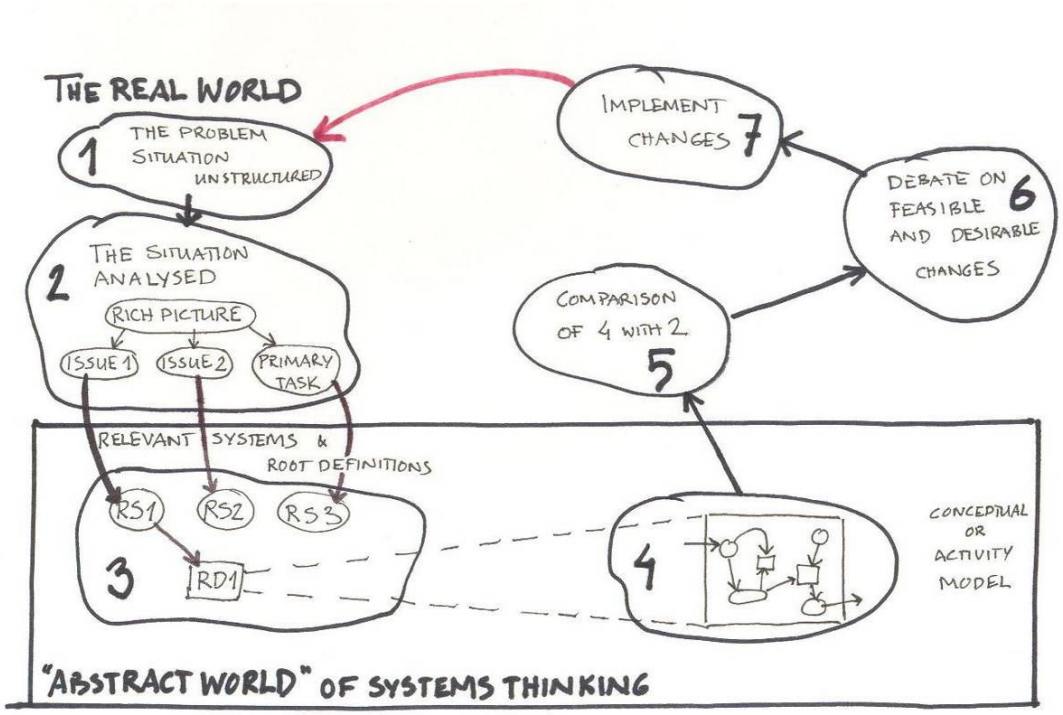

Figure 2. The Steps of SSM (modified from Naughton 1984).

Table 5. The research steps of Soft System Methodology (SSM) (after Naughton 1984)

Step	Activities
1. The problem situation unstructured	Learn about the situation by gathering quantitative or factual and qualitative and subjective information without trying to structure or look for problems. Which are the activities, actors, stakeholders etc.?
2. The situation analyzed	Structure the situation by creating a "Rich Picture" containing all the information. Images, symbols, text can be used to put down the situation on one paper. Here it is important to identify the main "tasks" that the situation is meant to fulfill. Also look for issues of concern. Conflicts? Informal tasks? Unresolved issues?
3. Relevant Systems and Root Definitions	In this step one search for systemic ways of viewing the situation. Ways which are articulated by naming hypothetical systems, known as "Relevant Systems". When some main tasks and issues are identified, you try to think up systems for each of them that would bear on them in a positive way. For each system a specific viewpoint is taken. But nothing hinders the researcher to take on parallel views of each system and follow them all the way through the remaining steps. Thereafter the system is described precisely and shortly in words, called Root Definition.

4. Activity (Conceptual) Model	In the forth step an activity model (conceptual model) of the system is designed. The model should include all the essential activities which the notional system would logically have to perform.
5. Comparison of 4 with 2.	This abstract activity model is then compared to what is perceived to exist in the actual problem situation. This will, in general, throw up differences between the real-world situation and the abstract model. Two outcomes of this stage are possible: a) a reassessment of one's views of the problem setting and in turn perhaps some different ideas for Relevant Systems and b) an agenda for possible changes which in stage 6…
6. Debate on feasible and desirable changes	…is debated with the people who are involved in the problem situation. The purpose of the debate is to identify changes which are agreed by the participants to be both feasible and desirable. Any changes which survive this process of scrutiny are then carried forward to the final stage of…
7. Implement changes.	…implementation.

In carrying out the steps of SSM an iterative approach is appropriate. Iterative learning and/or research cycle is a way of doing research and or learning where feedback is possible from one step of the process back to an earlier step (King 2000). E.g. having obtained the Root Definition you may decide that it is necessary to amend your Relevant System, and then to redefine the amended version. It also means that one research circle ending with implementation of changes can be continued by evaluating, finding new questions and do a second research cycle. A more appropriate metaphor would then be a research spiral (ibid). This is used within many fields e.g. Participatory Research (ibid) and Integrated Natural Resource Management (INRM) mentioned earlier. The following figures are taken from the INRM process to visualize the spiral:

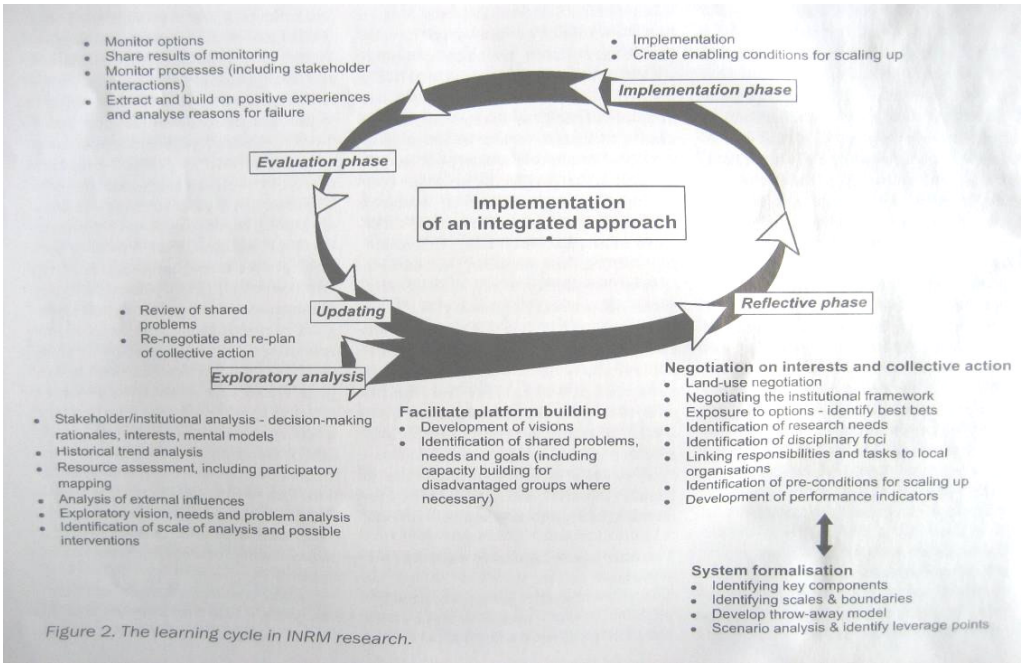

Figure 3. The Learning Cycle in INRM research (Sayer & Campbell 2004).

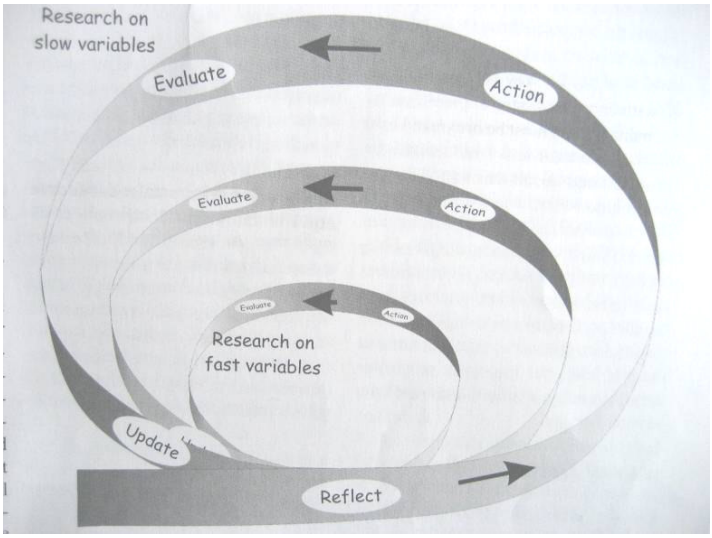

Figure 4. Overlapping learning Cycles (Sayer & Campbell 2004).

One of the analytical tools of SSM is the "**CATWOE**" explained by Dick B. (2002) as follows:

CATWOE Analysis - towards a "Rich-picture"

Part of "problem expression" is identifying the situational elements and parties involved. Checkland uses the mnemonic CATWOE to describe the human activity and situation. What is CATWOE?

Clients - (those who more or less directly benefit or suffer e.g. customers) from the machinations of the...

Actors - the players (individuals, groups, institutions and agencies), who perform the scenes, read and interpret the script, regulate, push and improvise. Identify and examine the role of local and institutional actors.

Transformations .... what processes, movements, conversions of X take place? What is the nature of the production and service transformations? What is the content and processes involved from ingredients to a sandwich, from mixed, varied data to information, from an idea to a performance concept or marketable product etc? What are the transformations that generate a product or a service? How are they achieved? How well are they performing?

Weltanschauung or world-view .... what is going on in the wider world that is influencing and shaping the "situation" and need for the system to adapt?

Owners - the activity is ultimately "controlled" or paid for by owners or trustees. Who are they and what are their imperatives? How do they exercise their ownership power? Are their other stakeholders - who claim a stake and a right to be involved i.e. as legitimate quasi-owners.

Environment - the trends, events and demands of the political, legal, economic, social, demographic, technological, ethical, competitive, natural environments provide the context for the situation and specific problem arena. We need to understand these.

NB: Actors, clients, owners etc may overlap.

CATWOE analysis helps in working out a "root definition" and expressing the domain of the problem. Avoid early conclusions about who and what is "important".

3.3. The Research Process

3.3.1. Planning of the study

3.3.2. Arrival at Brazil and getting to know the setting

The first two months were used for orientation in the organization of Cetap and to visit the various regions where they act. I read relevant literature, Cetap publications, participated in internal Cetap meetings as well as at meetings between Cetap and cooperating organizations, social movements, farmers unions and farmers. During this time and occasionally during the rest of the year, I participated in *visits to the farmers*, *study visits* (themes; the organization and logistics behind ecological markets, in Curitiba; cooperative and small scale industry, in

Ipê and Antonio Prado), *seminars* (Seed production and exchange, gender, solidary economy[14]), *markets* (solidary economy, ecological farmers markets) *courses* (environmental issues at the compulsory school of Padre Aleixo in Ibiraiaras) and *conferences* (The UN conference on biodiversity in Curitiba 2006). At the end of my one year stay in Brazil I organized a workshop about Sweden and Swedish seeds with the children from the compulsory school as well as a day of cooking and cultural exchange with a village of farmers with Polish and Italian ancestors (I have a Polish and Swedish background).

3.3.3. Planning of the field period

After the first two months it was decided, together with Cetap, which two farmer groups I should continue working with. We chose two groups which both had cooperated with Cetap for 15-20 years. One of the groups is made up of about 40% of the members of the village Vaca Morta. The village is localized in a strongly hilly area difficult to mechanize and the village is known for its internal strong organizational culture. Although participating they have maintained a certain independency of outsiders as farmers unions and social movements. The second group is made up of farmers spread out over a whole municipality called Ibiraiaras. The landscape here is flatter and the agriculture more mechanized. The organizational culture of the group is weaker but a strong interconnection with farmers unions and social organization stands out in this group. These properties were chosen as criteria for election of the groups for the study since Cetap feel that they are important ingredients in several of the groups they work with.

3.3.4. Field period at the farmer group regions.

This phase started off with reading literature and planning the field period. The field period was divided into two rounds in both groups. The first round was two weeks and then a second round of one week in each group. During each period I stayed at the houses of the farmers, participated in their daily work and interviewed them about their farms and their work with the agroecological process. The first round made it clear to me that I had to let all participants define their view of what agroecology is since it is a very fluent concept. I also wanted to separate the advantages and disadvantages of agroecology into two sub-themes; group work and agricultural practices. I believed this to be important since there were families that left the group but continued with ecological practices at their farm. Unfortunately at the time I only told the participants that I wanted to separate the group work from agroecology (and not agricultural practices). This might have caused some confusion or even a forced interpretation from my side. However the participants where always asked to define agroecology before I separated it into group work and remaining agroecological work.

In the farmer group regions some farmer families were chosen for a longer home-stay while other participants only for an interview. With the longer home stay families a resource and activity map over their farm was made (see example in appendix 5). Representatives for the following criteria were chosen for longer home-stay:

- Participates in the farmer group.
- In Ibiraiaras; left the farmer group.
- In Ibirairaras: owners and not owners of the truck used for product transportation (for their varying degrees of power and responsibility).

[14] Solidary economy is a Brazilian concept comparable to a small scale, local version of fair trade.

- In Ibiraiaras; associated to the school of Ibiraiaras (for possible impact of Cetap through activities at the school)
- Men and women (gender)
- People that have participated in the group from the beginning (historic view) as well as newer members (different situations)
- Showing an interesting work with agroecology.

Criteria for interviewees from the farmer group regions;

- All participants of the group
- In Vaca Morta; left the farmer group (but still lives in the village)
- In Ibiraiaras; left the group but continues the agroecological work.
-In Ibiraiaras; representatives from movements with intense cooperation with Cetap; the Small Scale Farmer Movement (MPA)[15] and the Rural Women Workers Movement (MMTR)[16].

3.3.5. Structuring and Analysis of the Material.

During the field period but mostly after it, I structured and analyzed the material I had comparing the two groups. A CATWOE analysis (see example in appendix 2) and a Rich Picture (appendix 3) were made. The 30 hours recorded interviews were uploaded to a video and audio editing computer program (Premier Pro 1,0) through which the interviews were listened to and divided into themes. For a better overview a brief summary of the interviewees statements was made in an excel sheet according to theme. Rich picture mind-maps (see example in appendix 4) were made over each theme and region. The regions were compared by examining the mind-maps and a document of a comparative analysis was written. This document was used for a participatory analysis together with 3 Cetap representatives chosen by me. The representatives were; my supervisor and a region responsible from each of the two regions that participated in the study. I decided it was more important for the representatives to have many years of experience of Cetap and the regions than for the team to be made up of both women and men. This resulted in a team of only men.

For the final workshop at the regions a presentation was prepared about the process of agroecological transition according to this study. The imaginary families were invented to represent this process in the farmer groups. Finally several identified Relevant Systems (see example in appendix 5) over what was needed for the agroecological transition were created. All this material was used during the final workshop with the participants from the chosen regions. The aim was to present the results, discus them and at the end compare an ideal version of their situation with their reality. Unfortunately there was not enough time to discuss possible and desirable changes. However I encouraged farmers and Cetap to continue this process if they found it relevant. The workshop will be described with further detail at the end of this thesis.

3.3.6. Tools and Techniques used

The methods, techniques and tools where; ***published and unpublished secondary data*** (Conway & McCracken), ***semi-structured*** and ***deep interviews*** (Kvale 1996, Pretty *et al*

[15] Movimento dos Trabalhadores Rurais Sem Terra (MST) works for the rights and livelihood of the landless workers
[16] Movimento de Mulheres Trabalhadoras Rurais (MMTR) works for the rights and livelihood of rural working women.

1995:74-76), ***group discussions***, ***workshops*** (Conway & McCracken), ***participant observation*** (Laurier), ***Sketched resource and activity map*** and ***field walks***.; to learn about the farm components, their function and interactions as well as in- and outputs of the farm (Buenavista & Butler 1994:38), ***brainstorming*** (Pretty *et al* 1995:218) and ***mind-mapping.***

Several of these tools are used within Participatory Rural Appraisal (PRA) and according to Chambers (1997;103) they have a specific role to play: **"**The essence of PRA is changes and reversals – of role, behavior, relationship and learning. Outsiders do not dominate and lecture; they facilitate, sit down, listen and learn. Outsiders do not transfer technology; they share methods which local people can use for their own appraisal, analysis, planning, action, monitoring and evaluation. Outsiders do not impose their own reality; they encourage and enable local people to express their own."

Table 6. Tools and Techniques used in the study.

Tools and techniques	Purpose	Description	When it was used
Secondary data	To achieve an understanding of the subject and the setting (Conway & McCracken 1990:224).	Published and unpublished written information	During the whole study.
Semi-structured deep interviews	For qualitative information were themes and issues are allowed to emerge (e.g. Kvale 1996).	Conversation like interviews that do not follow a rigid list of questions and order but main themes of interest.	During field periods at the regions and with Cetap staff.
Group discussion or participatory group meetings	To receive collective qualitative information and to observe group dynamics. To gather information effectively from respondents in issues that do not require privacy and where group views rather than individual perceptions are important (Joshi *et al* 2001)	Group discussions and meetings with varying degree of my participation, from mainly observational to facilitation.	Participation in farmer groups meetings, Cetap and movements meetings, Cetap internal meetings. Group discussion about the methodology of Cetap together with Cetap staff organized by me.
Workshop	To include participants in the study planning and analysis (Conway & McCracken 1990:225).	Active participation of all participants in decision making and formulation during planning and analysis.	With Cetap crew for planning and analyzing. With Farmers and other participants at the region for final analysis and discussion
Participant observation	To learn by doing. To discover tacit knowledge (Laurier). To give room for issues and themes to emerge.	By participating in meetings, activities, visits and in farmers' everyday life.	During the whole period spent in Brazil.

Field walks	To get a personal and the farmers view of the farm from a spatial perspective (CIDEWRI *et al* 1991:13). For issues and themes to emerge. Ice breaker.	Walking around the farm together with the farmer(s) while talking about the farm, its history, the farmer's family and all other possible themes that emerge.	Usually during the first or second visit to the farm.
Brainstorming	To quickly develop an unconstrained, non-evaluated list of issues, topics and questions using collective insight of a group for later discussion, grouping, sorting, prioritization (Pretty *et al* 1995:218),.	Free association around an issue. Writing down key words on a piece of paper or white board so everyone can see them. No comments during association. Afterwards all words are explained.	During semi-structured interviews and the final group discussion and analysis at the regions.
Mind-maps	During interviews: for visualization of the interview content with possibility for the interviewee to give direct feed-back and correct errors. To rationalize the process of interview analysis. For analysis: to get an overview of the situation, to discover connections and lacking information. For presentation: A visual and interactive tool.	Key words and symbols on a piece of paper representing subjects and sub-subject and how they are related to each other.	During the second round at the farmer groups. For structuring the interview material. For rich-picture according to SSM.
Sketched Resource and Activity Map	To get an overview of the farm activities and resource flows. To see activities from a gender perspective. For themes and issues to emerge. An opportunity for the farmers to give direct feedback on and correct my view of their farm. An opportunity to discuss the farm with the whole family.	Drawing the resources of the household. Draw arrows to show the resources flow of each enterprise and existing interconnection. Mark activities with gender signs (Buenavista & Butler 1994:38).	During the first round at the farmer groups.
Ranking by voting	To rank the importance of several alternatives. (CIDEWRI 1991:67)	For full description please se chapter *Final Workshop with Participants of the Study.*	During the final workshop at the regions.

Imaginary family	This is a technique I invented to be able to discuss what the different actors had told me individually when they gathered in a group. I chose to do it this way so nobody would feel I betrayed their confidence or feel attacked and to make it possible to discuss sometimes sensitive issues within the group.	The history of the group will be presented as the history of an invented family belonging to the group. The information is based on participatory observation, semi structured and deep interviews with the farmers, Cetap, the farmers union, the movement of small scale farmers and the women's movement. Two reports written by Cetap (unpublished) have also been used in the case of Vaca Morta; *Experiência da Associação de Agricultura Alternativa – Comunidade de Vaca Morta, Três Arroios, RS* written by Jairo Antonio Bosa and *introducão*.	The invented family has been presented to, discussed and corrected by the participants during the final workshop at the regions.

Chapter 4. Research Findings

4.1. Cetap and Other Actors

The following information is mainly based on; an interview with the Cetap coordinator as well as supervisor of this study Mario Guzón (2006), participatory analytical workshop with Cetap representatives (Cetap c), internal documentation of the work in Alto Uruguai (Cetap a), a resume of several documents about Cetap methodology (Cetap b) and a document on the cooperative work in Vaca Morta (Cetap c)

Cetap, which emerged soon after the cease of the dictatorship, was founded in 1986 by different civil society movements; Rural Landless Workers Movement (*MST*)[17], the Rural Women Workers Movement (MMTR), Movement of Small-Scale Farmers (MPA), the Dam-Affected People Movement (*MAB*)[18], Pastoral Rural Youth (*PJR*)[19] and the Rural Workers Unions (*STR*)[20]. These entities saw the need to counteract the environmental and social consequences caused by the green revolution and through Cetap they created an institution with the mandate to do so. The mandate has evolved with time to its present formulation; *strengthening the family agriculture and together with its organizations work for the construction of a sustainable agriculture taking agroecological principles as a starting point.*

Photo 1. The Cetap team December 2005

In order to fulfill its task Cetap performs extension service, education and are engaged in an experience of mutual and collaborative learning together with farmer groups and their organizations. Today the participants are about 350 families organized in 33 groups localized in over 14 municipalities divided into 5 regions (Altos da Serra, Planalto, Alto Uruguai, Encosta da Serra and Região Sul) (Weinberg 2006). Most of these groups have originally been mobilized by the STRs even if other actors have contributed with time. Some groups though, have been mobilized by the Pastoral Commission on Land (CPT)[21], MST or Caritas (*ibid*). The group of Vaca Morta was mobilized by the STR and the CPT while the group of Ibiraiaras was originally mobilized by the STR only (*ibid*).

Cetap also participates in several networks at different geographical scales. However they concentrate on a few which they believe correspond well to their own line of work, namely;

[17] Movimento dos Trabalhadores Rurais Sem Terra (MST) works for the rights and livelihood of the landless workers.
[18] Movimento dos Atingidos por Barragens (MAB) works for the rights and livelihood of the dam affected people.
[19] Pastoral da Juventude Rural (PJR) is a catholic youth movement (Pastoral da Juventude).
[20] Sindicato dos Trabalhadores Rurais (STR) is the Rural Workers Union which is associated to the small scale farmers. The large scale more commercial farmers have a separate union.
[21] Comissão Pastoral da Terra (CPT) is an ecumenical but originally catholic rural workers movement (Comissão Pastoral da Terra).

- *Ecovida* Network for Agroecology[22] (South of Brazil)
- *Future Earth*[23] (International)
- National Articulation of Agroecology, *ANA*[24] (National)
- Network for a GMO free Brazil[25] (National)
- Atlantic Rainforest Agroforestry Network[26] (Throughout the Atlantic Rainforest of Brazil).

At the end of my stay the work-team of Cetap was made up of 8 *technicians*[27] working out in the regions, two coordinators (one of which is also a technician) and one responsible for Cetap contacts and formation (courses, conferences etc). There are 4 persons responsible for administration and one for housekeeping. Three technicians and one administrator are based at the southern office, another three technicians and three administrators at the central office in Passo Fundo and two technicians at the Altos da Serra office. There is also a Cetap associated local team in Alto Uruguai made up of two farmers and one technician. This local team is a result of project cooperation which started 1991 between a local association for the promotion of a sustainable development (*Adatabi*), Cetap and a French Non Governmental Organization called Agronomes et Veterinaires Sans Fronieres[28] (*AVSF*) (Cetap a). The project worked for a sustainable development of the family agriculture in four municipalities in the region of Alto Uruguai (including the group of Vaca Morta) (*ibid*). The project is often referred to as just: Project Alto Uruguai.

In an interview with Guzón (2006) he explains that during the dictatorship the Farmers Union (STR) was organized to provide medical and dental care to the farmers. At the end of the 70ties and during the early 80ties an opposition against the dictatorship started. At this time people within and outside of the unions started to question their role and thought they should defend the interests of the farmers in agricultural politics and work for fair prices for the farmers etc. The same year that Cetap was created 1986 the opposition won the union election and took power in the union. It was decided that Cetap would find out which the production prices of the farmers were using referential farms, in order to facilitate for union leaders to discuss the agricultural politics. The referential farms were chosen farmer groups organized by the Rural Worker Unions. The Vaca Morta and Ibiraiaras groups both participated with these early referential farms. Each farm had a group of farmers attached to it. The idée was for more farmers to participate in the technology development at the referential farms.

This was the start of Cetap and during the first decade its role was that of a consultant to the entities in issues concerning rural development as well as techno-productive and organizational practices. Cetap helped make the strategic planning of the entities, the demonstration fields at the farms and at the Cetap centre in Pontão, organized meetings, courses and study visits (Cetap c). There was a pioneering work made with locally adapted

[22] Rede Ecovida de Agroecologia is a forum for actores involved in agroecological family agriculture in the southern region of Brazil and work to develope the same. A part of its work is participatory certification of agroecological products (Ecovida).
[23] Rede Terra de Futuro
[24] Articulação Nacional de Agroecologia (ANA)
[25] Rede por um Brazil livre de Transgénicos (Longhi 2006)
[26] Rede Mata Atlântica de Agrofloresta (Longhi 2006)
[27] Technician is a term used which can be compared to extensionist or consultant. Here it has a less top-down connotation than extensionist which originates from the transfer of technology paradigm.
[28] Agronomes et Veterinaires Sans Fronieres is a French Association for International Solidarity called Agronomists and Veterinaries Without Boundaries which acts for rural development, supports rural farming in underprivileged regions and contributes to advocacy and lobbying activity in the North and South in favour of these agricultures by making the most of existing skills in agriculture, livestock and animal health (AVSF).

home grown crop and green-manuring seeds. These home-grown varieties, compared with hybrid varieties, are more resistant to pests and diseases as well as better adapted to the local climate and soil. The cost of production diminished with 60-75% as these seeds do not need high inputs of synthetic fertilizers and pesticides. To improve the fertility of the soil and avoid erosion green manure plants were grown, also from home grown seeds. To grow their own seeds increased the earnings a lot but also the biodiversity and improved the long term productive capacity of the soil. In the case of corn these practices increase the annual mean harvest to the double of the national mean. Producing their own inputs also gave the farmers more independence from outsiders as agricultural companies and the government institutions and thereby more power over their own lives.

The direct work with the farmers was limited and always accompanying the entities. An exception was Vaca Morta were the work was more direct together with the farmers (Cetap c). In the spirit of Paulo Freire (Freire 1979) the farmer is seen as the main actor. Also the role of the technician is not that of an extensionist, paternalist but an educator creating an improved knowledge together with the farmers through communication. They were striving for creative solutions for every situation instead of presenting a “package” with “ready to go recipes” for the whole and any farm.

Cetap achieved to influence the entities (in varying degrees) to develop their work with sustainable development. With time, this work evolved into agroecological development. However a lack of systemic perspective to help the integration of the various dimensions of agroecological development was sensed. There were also different opinions between the different entities and Cetap on the form and direction that the agroecological development should take.

After a decade of existence these facts motivated Cetap to change their methodology. Instead of focusing on guiding the entities they put more energy into accompanying the farmer directly. This change was also motivated by an extensive external evaluation of Cetap at their request. Cetap felt it was important to combine the more global or political work with the day to day practices of the farmers to advance in consciousness and behavior. For Cetap, working in a close relationship with the farmers would mean an improved understanding of the various dimensions of the production system. The integration of these dimensions in the agroecological development work would then be easier. This is how the cultural aspects enter the scene. The productive system is also a mirror of the values, habits, traditions and believes of the family, community and society in general.

At this point Cetap also extends its focus on the farm to also include external aspects as commercialization. An important process of alternative commercialization begins. The idea was for farmers to have a greater control over the food chain as well as create a closer relationship between farmers and consumers. By skipping intermediates this was achieved as well as better prices for both farmers and consumers. This change was accompanied by a focus on technological solutions to promote ecological agriculture and to take upon the challenge of biodiversity.

During the last years Cetap is again questioning their efficiency in promoting agroecology. They see a possibility of being more efficient and advancing in the agroecological transition process by adapting a more clearly defined method. A method of diagnosis and planning with well defined tools which help to think of the farm and the groups as a whole (to make sure a systemic approach and action is being applied).

In the same line of thought enters the intent to work with whole communities instead of groups. This way the scale of action increases from the individual farms to a larger social and natural environment. Also the work with agroecological development expands to rural development in general. The hope is to include socio-cultural aspects of the communities which have a great influence on the actions of the individual farmers. A new area of action in the work with education and cultural aspects are the compulsory schools of the communities.

In order to manage this huge amplification of the work Cetap seeks for possible partners for cooperation where every actor would be responsible for their part. This would allow a flexible team depending on the needs of the communities. Knowledge and financing from other sources could be integrated into the process. One aim being the creation of a social pressure on the social institutions responsible for the local development to perform their duties.

4.1.1. The technicians methods for promoting the; joining, continuing and evolving within the agroecological process.

The following is a comparison between the Cetap team and the local team in Alto Uruguai. What are their views on how to encourage new families to enter the process, to continue within it and finally for them to evolve the agroecological process.

4.1.1.1. Joining

The method of the local team is similar to the traditional method of Cetap. That is, the STR points out families which they should work with. After this the technicians discuss the problems of current agricultural development with these farmers. Earlier the technicians focused more on the dangers of pesticides. Today this is to some extent replaced with consciousness of the importance of biodiversity, food security and economy. After these initial discussions the groups start to look for solutions to practical problems that they prioritize.

The local team works with small experiences, debates and study visits. These are always accompanied by evaluations and discussions to deepen the knowledge and consciousness. They emphasize the role of the technician as a motivator and convincer. They point out the difference between the conventional technicians of the multinational corporations whose principal preoccupation is the size of the harvest for the purposes of their company. Instead the preoccupation of the local team is the situation of the farmer.

Cetap means that earlier their work was more directed by the whish of the STRs and movements to present social and political alternatives. The role of Cetap was to work with the practical part of these alternatives in the production. Today this is no more so.

Today Cetap works with other methods as well. They approach whole villages and work with more ample spectra of rural development heading for agroecology. They focus less on pesticides and more on other environmental issues, niche markets and the integration of the whole farm in the agroecological work.

In certain areas where Cetap works they do not strive to include new families. Many times they join spontaneously thanks to the good examples of their neighbors engaged in ecological agriculture or through short time government programs which need more production and thereby more families.

4.1.1.2. Continuation

Both teams mention that since ecological agriculture diminishes the negative effects of conventional agriculture, the farmers chose to continue. Both believe that being organized in a group with continuous meeting motivate the farmers to continue. So does realizing common projects.

Commercialization is mentioned. Cetap believe that participating in the farmers market increase the farmer's self-esteem. The team in Alto Uruguai say that alternative commercialization generate a diversified production, motivate the planning of farm production and result in increased diversity not only for the city consumers but also for the farmers themselves.

Cetap see that one motivation is the encounter with the unknown; new persons, places, situations and knowledge that the study visits, courses and farmers markets offer. Study visits are also seen as important by the Alto Uruguai team.

The local team believes that once the farmers identify themselves with the agroecological process and become more conscious they are motivated to continue. They express it as that they root themselves within agroecology. The way to increase the consciousness is through constant reflection about their practices and debates within the forum of ECOTERRA. They wish to move the global and holistic discussion from separate moments of education to the day to day practice. They also believe that the visits to the farms with more difficulties help a lot. So does the new dynamic of work and discussion within the families. Many are motivated by the introduction of own seed production and small scale industrialization at the farms. Cetap also mention the industrialization.

Cetap believe they should direct themselves more to the youth. If they chose to stay at the farm the families are more motivated to continue with their agroecological work.

4.1.1.3. Evolvement

The local team believes that this occurs through the creation of a new space of identification. A culture (relation) is created were what is accomplished is valued according to the ideology and not only economy. This space grows when more families enter the process so that it can become the day to day chat of the village. They believe that if the income of the family increases they will be motivated to continue. They also need to shred the doubts the families might have.

According to the local team they work with similar methods as for the joining and continuation with agroecology but the capacity of questioning has to increase. They need to reflect over why they are not advancing? The difficulty they experience is to know how to integrate all the dimensions of this agroecological transition.

Cetap speak of study visits, courses and introducing new areas as; agroforestry, solidary economy and gender. Some farmer's want rules of certification so that they can judge others by them. Cetap is not sure this is the way.

According to Cetap the production and organization part has evolved. But this is not accompanied by the political relation to the same degree. They see difficulties in reaching this goal due to lack of interest from the farmers side. There is a conflict between the time spent on production/economics and reflection/education. The farmers think that they do not have

time for education. There is a lot of empirical knowledge but a lack of systematization of that knowledge. This hinders development.

4.2. The farmers groups

We chose two groups which both had cooperated with Cetap for 15-20 years. One of the groups is made up of about 40% of the members of the village Vaca Morta. The village is localized in a strongly hilly area difficult to mechanize and the village is known for its internal strong organizational culture. Although participating they have maintained a certain independency of outsiders as farmers unions and social movements. The second group is made up of farmers spread out over a whole municipality called Ibiraiaras. The landscape here is flatter and the agriculture more mechanized. The organizational culture of the group is weaker but a strong interconnection with farmers unions and social organization stands out in this group. These properties were chosen as criteria for election of the groups for the study since Cetap feel that they are important ingredients in several of the groups they work with.

4.2.1. Vaca Morta

The group Vaca Morta was named after the village in which it was founded. Today there are also three families from nearby villages in the group. The name itself means Dead Cow but a village woman told me they believe it originates from an early settlers surname with a similar pronunciation. The village belongs to the municipality of Tres Arroios since 1987 when it was emancipated from the larger municipality of Erechim (Estado do Rio Grande do Sul). Today about 3000 inhabitants live in the municipality (FEEb). Tres Arroios is located in the north of Rio Grande do Sul close to the Urugai River in the micro-region Alto Uruguai. The region is mixed plane and strongly undulated. Vaca Morta is situated in a steep valley.

Before the arrival of the European settlers the area was mainly habited by Kaikáng and to some extent Botocudos and Guarani (Estado do Rio Grande do Sul). Since the arrival of the colonizers agriculture has dominated the area. Main products have traditionally been grain (wheat, soy bean and corn), milk, swine, erva-mate tee and citrus (*ibid*).

The history of the group will be presented as the history of an invented family belonging to the group (for explication please see the chapter on Methods).

The information is based on participatory observation, semi structured and deep interviews with the farmers, Cetap, ECOTERRA, Adatabi, Two reports written by Cetap have also been used (Cetap a and b).The invented family has been presented to and corrected by the participants in a group discussion.

4.2.1.1. The Imaginary Family of Vaca Morta.

The owners of the farm are Luiz and his wife Georgina. They have two children Christa 18 years old and Nilton 19 years old. Luize's grandfathers came to live on this land almost a hundred years ago. At this time the production was diversified and mainly for home consumption except for wheat and swine which were for sale. With the modernization of the agriculture in the 70ties, specialized producers took over that production and the family entered in a crisis. At this time many started to grow soy bean for the national and international markets. The instability of the market, the fact that the land was hilly and not adapted to soy bean monoculture made the family leave that production. It was decided that

the family should do contracted[29] swine production. This seemed more secure and better adapted after the region topography and tradition.

The productivity of the soil was declining, the cost of production was rising and the price for their products always getting lower. The village joint work associated with the wheat production disappeared with the entrance of contracted production. It opened the door for an every-man-for-himself mentality. All this motivated the family together with other farmers, organizations, movements of the church and the Rural Workers Union (STR) to protest and search for alternatives.

There was a whish to become independent of external inputs in order to diminish costs and be less vulnerable to agricultural conjunctures and politics. With time it became increasingly important to be independent of intermediaries both in the production and commercialization. This was a way to be in power over their life and farm.

At the end of the 1980s a pioneering work with seed production and soil recovering begun. The participants were a group of farmers from Vaca Morta, the Pastoral Commission on Land (CPT), the Rural Workers Union (STR) and Cetap. One farm was chosen to be reference for all others where experiments and meetings were held. The experiments focused on green-manuring, crosses of hybrid corn varieties and breeding on creole (traditional) varieties. These experiences became a reference on a state, national and even international level. At a time several visits a week were received. The farmers went to educate people in other municipalities and states. National expositions were organized. But this influence does not seem to have had occurred in their own municipality. The weak organization of the STR, the lack of support from *Emater*[30] and the party-political rivalries existing within the municipalities might all have been important factors in limiting the number involved farmers within the municipality.

At the same time 25 families in the village were looking for an alternative organization of the production based on cooperation. During these times ideas of large cooperatives flourished. One of great importance and status in the region was Cotrel[31]. For the small scale farmers to become independent of these large cooperations which promoted an industrialized agriculture in 1994 the Rural Workers Unions created their own cooperation in within the dairy business Corlac[32]. But 12 of the 25 families decided to take smaller steps and 1992 they created their own association were all members had a vote and active participation; *The association of Alternative Agriculture,* more known as *the Association*. Through the Association several common investments were made; a cereal dryer, a seed classifier, a machine for vapor juice production, a truck, material for greenhouses etc. At the time this initiative was ridiculed. Today Cotrel has found itself in serious economical difficulties and Corlac seem to be suffering from increasing exclusion of its members. These facts have made several people acknowledge the initiative of the small group that formed the Association. The group believes that their Association work for the viability of its members while the big corporations work for their own viability.

[29] Contract production: A company is the owner of the production. It decides about the inputs, managment and prices. The farmer lends his/her land and labour to the company in exchange for a predefined pay.
[30] Emater/RS = Associação Riograndense de Empreendimentos de Assistência técnica e extensão rural. (Riograndе association of enterprise of tecnical assistence and rural extension)
[31] Cotrel = Cooperativa Tritícola Erechim (Grain Cooperative of Erechim)
[32] Corlac = Cooperativa Riograndense de Laticínios e Correlatos Ltda (Cooperative for Riograndе Dairy Products)

During the 1990s they started to diversify the ecological production and do direct sale in the city Erechim. 1998 the ecological farmers market opened in Passo Fundo. At the same time new members started to join the group motivated by negative impacts of the pesticides and in search of alternative income. The oldest members of this group never started to use much pesticide.

At the turn of this century the group enters a project of sustainable development of the family farmers in the region of Alto Uruguai (Project Alto Uruguai) including four municipalities. The project was a result of cooperation between a local association for sustainable development (Adatabi), Cetap and a French NGO called Agronomes et Veterinaires Sans Frontieres (AVSF). A decision was taken that project participants were not allowed to use pesticides nor synthetic fertilizers at any part of their farms in order to sell their ecological products. Together with farmers from the four municipalities a Regional Association for Cooperation and Agroecology, ECOTERRA, was created to promote and organize alternative commercialization. Through ECOTERRA ecological products are being sold at the ecological farmers market in Passo Fundo, at their own store in Erechim as well as in other stores in the same city. Efforts are made to reach markets further away when needed. For example fruits are being sold to other states. The alternative commercialization in the hands of the farmers and a work of saving and multiplying various traditional seeds is the focus of the agroecological work in the region today. Recently a more intense work with agroforestry has started.

Going back to our family. Their farm is 10 ha large. They have no major problems with water access but during last years heavy draughts they have found themselves without enough water at times. 3 ha are native forest, eucalyptus, and secondary forest. A part of that area is used as a tree covered grazing meadow for the cows. The family has 4 cows (3 milking), 2 ha of successive grazing area, 1 ha corn, 1,5 ha beans, manioc, peanut, sweet potato, sugar cane etc. ½ ha of erva mate (kind of tee), 1 há fruits and 1 há house, henhouse, pigsty etc. They also produce some cheese, milk, salami and sugar for sale. The whole production goes to own consumption, ECOTERRA and selling to neighbors except for erva mate which is sold to an Erva Mate cooperative.

Luiz mainly works on the fields and takes care of the pigs but also helps out in the kitchen garden. Georgina works with housekeeping, taking care of the youngest son, in the kitchen garden and with the cows. Christa helps her mother with the housekeeping and in the kitchen garden when she is not at school but is thinking of looking for work in the city. Nilton makes more mess than he helps out but tries to do his part. To manage the family pays the neighbors son to help them two days a week.

They are thinking of installing a small scale erva mate industry and produce fruits in an agroforestry system. In the future they could sell erva mate, fruits and fruit products through ECOTERRA. This decision will depend on if the children chose to stay on the farm or not.

4.2.2. Ibiraiaras

In the case of Ibiraiaras the name of the group is the same as the municipality over which the members are dispersed. It belongs to the micro-region Passo Fundo. According to Cetaps working regions it belongs to Altos da Serra. It is an undulated area situated at the highest point of the high plateau more than 700m over the sea level. The name, Ibirairaras, means

lords or *gods of the forest* in indigenous language. The forest however was diminished by 82% at the end of the 70ties (Gaudagning 2000). The fate of the indigenous people was mentioned earlier. According to Gaudagnin (2000) about 90% of the 6 921 inhabitants (FEEb) have Italian ancestors. The remaining part is African and Indigenous. The agricultural sector is dominating and has for a long time been focused on potato (Gaudagnin 2000).

The history of the group will be presented as the history of an invented family belonging to the group, just as in the case of Vaca Morta.

The information is based on participatory observation, semi structured and deep interviews with the farmers, Cetap, the STR, the Movement of Small Scale Farmers (MPA) and the Women's Movement (MMTR). Two reports written by Cetap (unpublished) have also been used (Cetap a and b).The invented family has been presented to and corrected by the participants in a group discussion.

4.2.2.1.The Imaginary Family of Ibiraiaras.

The owners of the farm are Giovana and Valdir Ferreira. They have reached an age were they deserve some more rest and left the management of the farm to one of their sons and his wife, Antonio and Carla. They in turn have three children; André 20 years old, Jefferson 17 years old and Luana 10 years old.

Giovana and Valdir bought the farm 53 years ago. During the agricultural modernization they also converted their farm to produce mainly potato, corn and soy beans. The problems associated with this kind of farming were becoming more evident each day and various entities (movements, church, organizations, farmers union) started to protest, make people conscious of the problems and search for alternative solutions.

Even though Giovana and Valdir felt that a good farmer should have large and weed free fields, they were influenced by the health risks of pesticides. After many discussions with their son they accepted that a part of the farm would be managed ecologically. The fact that the farm input prices were escalating and the prices they got for their products were decreasing also motivated the family to search for alternative options within agriculture. The oldest son is very interested in ecological agriculture but since he works and studies in town he only helps out from time to time. His parents send him food from the farm since the prices in town are high and his salary low. Jefferson helps a lot but is disappointed with the economical situation and is thinking of following the trend by producing tobacco. A reason for certain tension within the family since it is a highly toxic production. Luana helps out were possible considering her age.

To diminish the use of pesticides and to guarantee a monthly income, Antonio and Carla enters a group that works with production and direct commercialization of ecological and diversified products. They thought it would be easier to find a different way of producing and living in the rural area if they participated in a group than doing it by themselves. As they felt they needed manure for their ecological farming and thought it was a good idea to secure their monthly income with yet another activity they decided to produce and sell milk.

The ecological group had already existed for about 15 years. They started out with growing their own seeds and recovering the soil. This initiative was taken by the Rural Workers Union (STR) with assistance of Cetap, who with time started a direct accompaniment of the farmers.

There was also cooperation with the Movement of the Small Scale Farmers (MPA) and the Rural Working Women's Movement (MMTR). The Union (STR) had organized the farmers in groups within the villages of Ibiraiaras that worked and acted together. Experiments were made with growing corn, potato and onion seeds.

In 1992, 26 persons from these groups decided to buy a common truck for commercialization purposes. *Caritas*[33] supported them with a favorable loan for a truck and greenhouse material. Cetap accompanied the organization and production as well as commercialization. The work was focused at diversified and ecological food for home consumption and the outdoor farmers market. Unfortunately most of the 26 families dropped out almost from the beginning. Many thought that it was more work and less money than they had expected. Several did not succeed in adapting themselves to the group work and decision making. The group became smaller which increased the work and costs. The loan had to be paid and the rising value of the dollar did not help. The group started to sell even conventional products directly from the truck to have money to pay the loan. It was also decided that new members had to pay more transport fee than the old ones that already had paid a lot. At the same time there was a distancing between the group on one side and the STR and MPA on the other, caused by difficulties in the cooperation.

A few years ago an initiative was taken to open a store for agroecological and *colonial*[34] products, the Quitanda. The project has encountered several difficulties and created conflicts. As a result there were too few families well organized enough to supply Quitanda and the continuation of the project is uncertain. The conflicts and difficulties with the commercialization have contributed to even more families leaving the already small group. A few new members entered about 4 years ago but also they encountered different difficulties or had hoped to earn a lot more money and left the group. Some of them still produce partly ecologically. There is still a desire to continue. Some families are for example making new experiments with agroforestry or planning to expand their food processing. But, the conflicts and related insecurity of commercialization have left the group somewhat paralyzed. Most members are waiting to see if something can be changed. Several families are looking for alternative incomes.

Now back to our family. Their farm is 12ha large. They have access to water but it is diminishing every year and there are times of the year when it is lacking. 3 ha are old wild forest, eucalyptus and wild young trees and bushes. The family owns 6 cows (4 giving milk) on 2 ha successive pastureland and sell the milk to a large cooperative. They grow 4,5 ha of conventional corn and soy bean for ensilage and sale. 1,5 ha is horticultural products including vegetables, potato, fruits, wine grapes, sweet potato, manioc and much more. These products are for home consumption and sale at the farmers market and Quitanda. 1 ha is destined for the house, hen house, small tree covered grazing meadow and a fishpond. They also sell some home-made jam, conserved vegetables and fruits, juice and sometimes cheese at the farmers market, Quitanda and to family and friends.

They use herbicides in the corn, soy bean and to dry the pasture before the next crop. The products for home consumption and direct sale are ecological. They do not whish to expand the ecological part of the farm since horticulture products need a lot of work and water,

[33] Caritas Internationalis is: "*a confederation of 162 Catholic relief, development and social service organisations working to build a better world, especially for the poor and oppressed, in over 200 countries and territories*". (Caritas)
[34] *Colonial* refers to the colonizers and means handicraft products made by small-holders, but not necessarily ecological.

because they need the land for the cows and because the market is uncertain. The last years the group has become smaller making commercialization more expensive and requiring more work. Certain socio-political turbulences also make the work more difficult so the family decided to expand the milk production to assure their income.

4.3. The main actors view on Agroecology

The main actors view on agroecology has been interpreted from interviews and observations in the field.

4.3.1. Farmers

The farmers see agroecology as mainly an internal transition process of the production system. That is, creating better agricultural practices for human health, household economy and the environment (without pollution, deforestation etc). This is often limited to their household but sometimes also includes the village or municipality. There are two important exceptions from this scale of action: the commercialization and the recovery and multiplication of traditional varieties of seeds. The work with commercialization is very present in the agroecological work and reaches regional and even state level of action. The organization of a production system and distribution system of traditional seeds is a cooperative work that extends far beyond the community level.

I observed an intelligent use of farm internal resources and avoidance of using external resources. However, the farmers motivate this mostly by economical reasons and to some extent for its ecological function (e.g. soil fertility) on the farm. Wider environmental functions are not mentioned (e.g. environmental equilibrium where nutrients and energy are recycled within ecosystems, a sustainable use of world limited resources, avoid the pollution caused by production of external resources etc.). There are exceptions of course that show a systemic view on our social and natural environment. In some cases the relation between amount of animals and land is mentioned. Others mention the drift of pesticides from neighbors or appropriate treatment of garbage. The lack of water due to deforestation, excessive use and elimination of wetlands is commonly mentioned. Some speak of leaving native forest growing for the wild animals and natural enemies of pests. Still, the most common perception is that of the farm as a separate unit. For example no one mentions the loss of nutrient to groundwater and surrounding surface water which later causes eutrophication. Probably little attention has been given to these matters since there have been several more acute and problematic issues to deal with. It also takes time for indirect systemic problems to occur and to be understood. Also, Cetap started out with a political, technological and organizational agenda. The knowledge about, and focus on, environmental issues grew with time.

In Vaca Morta there is a rule that the whole farm must be under ecological practices to be able to sell the products as ecological. But I observed that in practice this means not using synthetic fertilizers or pesticides. It does not necessarily imply a better understanding of the ecological mechanisms or the environmental function of closed circuits on the farm.

The understanding of “the whole” or the process of external agroecological transition is sometimes expressed as a felt need for increasing people’s consciousness. Another example is when farmers speak of how “truths” and values are manufactured and how this influences the development or about the power and interests of multinational corporations, politicians and researchers. Individualism is mentioned as an obstacle both in the internal and external

transition. *Gender*[35] issues are almost never mentioned though. But these issues are usually seen as external to, or the context of, their process of agroecological transition and not as a part of it. Even so, some is present in their actions; the Association of Alternative Agriculture in Vaca Morta, the engagement in the school of Ibirairars or the STR and the relations with the consumers are all examples of that. In Ibiraiaras the STR and MPA have worked intensively with the political and organizational part on a scale larger than the individual farms. However their work is limited to certain socially and politically defined groups rather than a geographical division on a landscape level.

When it comes to ecological agriculture practices both groups seem to be well informed. Perhaps the members of the Ibiraiaras group spoke more of specific techniques, but I could observe the same techniques in practice in Vaca Morta. This means that there is not necessarily a difference in the level of knowledge between the groups. However the difference does exist within the groups, especially in Vaca Morta. This could partly be explained by the fact that there are more new members in Vaca Morta. There seems to be few moments where the group members could share each others experience and knowledge. These moments when they occur are however highly appreciated.

It was very interesting to see the focus on prevention instead of curative measures; crop rotation, maintain high soil fertility, plant at the right time, create environments for natural enemies, keep trees growing close to water sources are some examples of what I observed. The great diversity of crops helps maintain a very good crop rotation. Even so it was not uncommon to come across very simple crop rotations in the fields. Perhaps where green manure is grown every winter there is no need for intensive crop rotation? Very few farmers complained about pests and diseases. Almost no one mentioned the order of the crop rotation to achieve a nutritionally balanced soil for the following crops.

Biodiversity was mentioned in association with; a balanced soil, avoiding diseases, water source protection, natural enemy habitat, climate control, food and income security (there is always something to harvest) and as a positive factor in commercialization. I observed some examples of intensive intercropping (plants preferred by pests in between crops, tomato x salad, corn x pumpkin, vines and living mulch, complex agroforestry systems). It seems to be an area of development with great potential. Except for complex agroforestry systems there seems to be a need of developing well functioning systems of live and dead mulch between the crop rows (there are some problems with larvae cutting of the stems under the mulch). Also functional intercropping with for example low growing leguminous plants to decrease the need for weeding would be popular amongst the farmers.

4.3.2. Technicians

The technicians' vision of agroecology is more global or holistic. The focus is on a new relationship between humans and between humans and their environment. They work with both internal and external transition on a daily basis. The method for this is to create a new understanding, ethic and positive examples. The way to the goal is equally important as the

[35] *Gender* is often confused with sex. However, sex generally refers to biology and anatomy. By contrast, gender refers to a set of qualities and behaviours expected from a female or male by society. Gender roles are learned and can be affected by factors such as education or economics. They vary widely within and among cultures. While an individual's sex does not change, gender roles are socially determined and can evolve over time. (ENGENDERHEALTH)

goal itself. The Cetap team is closer to this vision while the local team in Alto Uruguai is somewhere between this vision and the vision of the farmers described above.

4.3.3. MPA

In Ibiraiaras the Small Scale Farmers Movement (MPA) see agroecology as a method but not as a final objective. The objective is to create a socialist society with more power, justice and improved living conditions for the small scale family farmers. This is done by an organized collective fight for their rights. This objective is more important than the way to it.

4.3.4. General

In general there is little said about the role of domestic animals within the agroecological vision. Sometimes their ecological function is mentioned. However the discussion on the relation between humans and animals or how to treat animals according to their natural needs is marginalized.

4.4. Comparing views in Vaca Morta and Ibiraiaras

Below follows a thematic comparison between Vaca Morta and Ibiraiaras based on the interviews and observations during the field periods.

4.4.1. Issue 1. Why Agriculture?

When asked why they work with agriculture, some farmers start mentioning a lot of positive things about living on the countryside and working with agriculture. But, many of the farmers begin their answer with that;

a) This is the only thing they really know how to do.
b) It is a habit.
c) They do not have an education so a job in town would be difficult.

I believe that many farmers have a low self esteem since farming has a very low status. This feeling was probably reinforced by the fact that I am a university student from a first world country and I felt that they automatically started excusing themselves for not doing anything more “important” or “intelligent”. I tried to reformulate the question. Is that the only reason, I asked, or does agriculture also offer something that they enjoy? At this point the answers start to be very much more positive and similar to each other;

d) Agriculture is a way of life.
e) It offers quality of life by;
    - its proximity to nature,
    - the joy of working and
    - the feeling of liberty.

This feeling of liberty was very strong and most strongly emphasized in Vaca Morta. It was described as being your own boss, being able to decide what to do and when to do it, by yourself. In a country where poor labor exploitation is common and sometimes take very ugly forms I can understand the great importance of this liberty. Other times the feeling was described as something more abstract. A male farmer in Vaca Morta said: *“When I go up the hills and work the land, I have the sensation of my head being so free”.* A woman farmer in

the same village expressed a similar feeling *"when I am at home [taking care of the household] I feel imprisoned. But when I get out on the fields… I am free."* I was overwhelmed by the frequency and force of these statements.

Almost all farmers and Cetap staff mentioned that a big advantage was having;

f) Food security and quality.

Cultivating your own food gives you the possibility of securing your food access, even when you lack money or food prices rise. There are still moments when the harvests fail, especially due to the drought, when it is important to have money to be able to buy what is lacking.

In some families, mostly the women in poorer families express an agony over not being able to get over the threshold where the farm work gets more viable. They are more prone to see the city as a solution to their difficulties. A woman in Vaca Morta that newly entered the group said: *"I like to live at the countryside but as our situation is now it would be better for my children to educate themselves and find work in town. It is too hard work just to barely manage"*.

Most families see;

g) Life in town as something negative.

It is expensive, lonely and dangerous. When compared to the countryside it is noisy and stressful and there are very little things you can do.

h) At the countryside there is more community spirit and joy.

Except for the stronger emphasis on freedom in Vaca Morta there is no big difference in the motivations to work with agriculture between the two groups.

4.4.2. Issue 2. Why Agroecology?

I have reached the same conclusion as the Alto Uruguai staff. There are three kinds of farmers that enter the agroecological process.

a) The once motivated by improving their livelihood.
b) The once motivated by improving their health.
c) The once driven by a social and ecological consciousness.

This is also the case in the two groups. In ***Ibiraiaras*** the main motivation is health and thereafter livelihood. In ***Vaca Morta*** it is the other way around. Most farmers belong to the first two categories. At this point it is worth remembering that the work of Cetap when it started in 1986 did not begin with agroecology, but with social organization of the farmers and ways of being more independent and diminishing the cost of production. The work was more politically oriented. Agroecology entered in 1992-93.

When talking to the farmers and farmers movement it becomes obvious that in ***Ibiraiaras*** the focus has been on *diminishing the intensive use of pesticides and other synthetic fertilizers*.

Probably because it is a potato growing municipality (intensive use of strong pesticides) with a very elevated number of cancer cases and other health problems as a consequence. In ***Vaca Morta*** the use of pesticides at the time of foundation of the group was quite limited. Several families never used pesticides. It seems that the "modernization" of agriculture came later to Vaca Morta than Ibiraiaras, and in a different form. This is due to the *topography* which makes it difficult to industrialize the plant production. Instead the contracted pig production was established in the village. With ever rising prices of inputs and equally low or diminishing farm-gate prices the livelihood was becoming a problem. Loans became impossible to pay back and the contracted production became a negative spiral. To manage the production had to grow, but the benefits for the farmers did not grow with the size of the production. This is why *lowering the price of production and social organization* became an entry point for Cetap.

When talking to farmers with more experience of the agroecological work, it becomes clear that, with time, the reasons to continue with agroecology may shift in focus and become more diverse and nuanced. This seems natural since experience and knowledge is gained with time. There is a constant opportunity to exchange ideas and learn about different realities. Or as a farmer said *"in a group you are able to think about the whole [situation], alone you are only able to work"*. Also some initial difficulties with health or livelihood are overcome. This opens up for the possibility of focusing on other motives, widening the horizons of the work with agroecological transition to imply the *creation of truly sustainable systems in all aspects of sustainability* (social, economical, political, ecological, ethical). If this widening of the horizons does not occur it is more probable that the work with agroecology is abandoned when for example *greater difficulties are encountered* or *more profitable options emerge*. Reasons often mentioned during the interviews as to why some farmers chose to desist from the agroecological process.

Both in ***Vaca Morta*** and ***Ibiraiaras*** a strong motivation is *diminishing the cost of production by becoming independent of external inputs.* Especially in ***Vaca Morta*** the *elimination of middlemen* is mentioned as a way of increasing the profit of the farmer. ***Both groups*** are very preoccupied with *maintaining their natural resources*, which are the base of their production.

In ***Vaca Morta*** there is more emphasis on the *food security, less risks by eliminating the middlemen* and *maintaining the ecological balance.* At the same time the *lack of commercialization options* is mentioned. This might be less so in ***Ibiraiaras*** since it is a plane area and *more interesting to agribusiness*.

Especially in ***Vaca Morta*** the *biodiversity* is seen as a *security* of always having something to harvest during the year. Since plants have different preferences and tolerance a high biodiversity also increase the probability of something surviving when the climate is not favorable to common cash crops. And if there is something to harvest then there is something to eat, and to sell. Even if the harvests would fail, they have some animals from which they can get meat, milk, cheese etc. And when growing not only cash crops like corn or soy beans but also vegetables it does not take too long before new vegetables are ready to eat and sell. Biodiversity is also seen as a *strategy for commercialization*. High diversity of products attracts the consumers. If they find what they need at the ecological market then they do not need to run to several places for their shopping. This increases the probability that they chose the ecological market as their point of shopping. Also, some products are difficult or impossible to find elsewhere.

In *conventional farming*, on the other hand, that *specialize* on a single or just a few cash crops as soy bean or corn the farmer can *loose a whole year's work and earnings* when harvests fail. From time to time there is a *crisis due to low prices* of the crops. Even if the harvests succeed the prices of the cash crops might be so low that it barely covers the cost of production. The farmers also tell stories of times when not even the cost was covered. At these times, the loans taken, the cars and land bought and houses built when times seemed good and the family business had a large economical turnover, are sold and abandoned. The families give up, sell their land, and if they cannot find any non-agricultural work in the country side (carpenter, bricklayer, union employee etc) they move to town in hope of finding something better to do. This is an accelerated process which has occurred during a long time in the municipality of ***Ibiraiaras*** and just the last few years in the village ***Vaca Morta***.

The above economical/livelihood arguments are also mentioned by one or two families in ***Ibiraiaras*** but the main focus lays on *maintaining the natural resources* and *lowering the costs*.

To my surprise the farmers mention that in agroecological agriculture the work is *less hard*. They explain that in conventional monoculture production there are labor peaks when very monotonous and hard work has to be done. While farming within the context of agroecology is focused on biodiversity which makes the *work* become more *evenly distributed over the year* and *less monotonous*. They also mention, ***especially in Vaca Morta***, that *conventional farmers* who often are very dependent on one or a few products are at greater risk when something goes wrong or costs rise and/or prices fall. They then need to increase the production or look for complementary work somewhere else. They have *very little spare time, are stressed* and *exhausted*. The competition with the large scale industrialized agriculture productions becomes impossible. At a certain point there is just not enough space or labor to continue growing, the land becomes degraded, water is lacking and, again, they sell the land to a bigger landowner (if lucky) and move to town.

Other factors that motivate the work with agroecology are *improved results in the production* (***especially*** mentioned in ***Ibiraiaras***) as well as *friendship, learning new things* and *getting to know new places and realities*. These possibilities are created by the exchange visits, courses, meetings and selling together at the ecological market in towns.

4.4.3. Issue 3. Disadvantages of Agroecology and the discussion on lacking manpower.

The farmers mention few disadvantages intrinsic to agroecological farming. Normally it has to do with the;

a) Difficulties of producing at certain times of the year (drought, between seasons).
b) Some complain about low income or
c) The lack of manpower (many times for weeding).

Also here the perceptions differ more within the groups than between them. The lack of manpower is frequently mentioned as a motive for not expanding the ecological part of the farms or for leaving it entirely. Hence it deserves a closer look. It is general knowledge and mentioned by both farmers and Cetap staff that for some time now, the *manpower in rural areas is truly diminishing*. The families are getting smaller. Many farmers told me that they had several siblings and just one generation before them it was common with 10-20 children

per family. Since the *children of today study more years* their physical preparation for, and knowledge about agriculture is less. *Education opens many possibilities* for them and through the school they *identify more with the city*. As a result many opt for a life in town. The *average age in agriculture is rising* which also contributes to diminishing physical capacity.

Even so, analyzing available human and natural resources of the farms, in many cases it would be possible to adapt the farm-system to available manpower by redesigning it. Both Cetap and MPA agree on this and believe that the reason to why it is not done is partly explained by *lack of commitment to the aims of agroecology* in MPAs words or *cultural* according to Cetap. We will come back to the discussion about the cultural influence. Analyzing the farms I have visited I agree that there seems to be changes possible to make within ecological farming to better suit the available manpower. When discussing these options with the families other underlying limitations emerge. It could be;

- Lack of water,
- Divergent ideas about the farm within the family,
- Uncertainty and instability of the ecological market,
- Insecurity of how to produce new cultures or how to practice previously untested methods,
- Already made investments on the farm which discourage certain changes.

Coming back to the discussion about the *cultural and social influence*, many farmers feel they are *ridiculed and disdained* by people in their villages because they produce in a way that differ a lot from the regional model. In a strong culture of mechanized monoculture of soy bean, corn, livestock and chicken the success is measured by the *size of the fields*, how *weed free* they are, the *grade of mechanization* and the *size of the turnover* (and not necessarily the profit).

The lack of knowledge about the logic behind ecological production creates a perception of the ecological farmers as late/behind in development or lazy. Some examples could be mentioned. The ecological farmers sometimes leave certain weeds for ground cover against humidity loss, for green manure, because they attract natural enemies or because some pest prefers that weed before the crop. Some also add straw and green manure between the rows for fertilization, improvement of soil physical properties as water retention and aeration, to suppress weeds as well as to increase the micro-flora of the soil. High biodiversity, green-manuring and intercropping can look messy when you are used to monoculture. This way of farming is then seen as lazy since they do not keep *order* and the fields *free from weeds* – a sign of quality within the paradigm of conventional agriculture. Another sign of success is the already mentioned high economical turnover. The ecological farmers usually do not have a big economical turnover. This is because they prioritize small scale production with higher care of each product, independency of external inputs and loans. According to Cetap and farmers this does however not mean that their long term profit is necessarily lower. It is not uncommon that indebtedness becomes a vicious circle difficult to get out from and then high turnover really does not mean much.

The ecological farmers are of course neither totally free from these modern dominant perceptions, nor from their cultural heritage. They are *influenced by how their forefathers from Europe cultivated the land*. For example, in Europe it was and is usual to clear the land before planting. At an early stage of my education I was told that the soil is tilled so that old plant parts will be incorporated into the soil, to aerate the soil, to make it heat up earlier at

spring after a long winter and to facilitate the freezing of clay soils so their structure will improve.

In Brazil, I "discovered" that there is no prolonged freezing winter and the subtropical red soils are easily eroded when the vegetation is cleared. The biological turnover is faster and with tilling the soil organic matter will decrease even faster. The sun is hot and the farmers complain that water is getting scarcer every year, partly due to the huge amount of forest that has been cut down. Under these conditions an uncovered soil is rapidly degraded. Today part of this knowledge has been incorporated even into conventional agriculture. It is very common to use no-till agriculture but then using round-up herbicide to get rid of the weeds, leaving the soil uncovered in the rows. At the same time it is known that several indigenous groups have the habit of growing crops in the forest or intercropping them. Considering the facts mentioned above this method of production seem more adapted to the local conditions.

Tilling and weeding are activities that require a lot of man-, animal and/or machine power. Seeing some weeds as a resource, controlling others by adding soil cover or intercropping with specially adapted nitrogen fixing plants are examples of *ecological methods requiring less manpower* that strengthen the system instead of degrading it. But, they are many times *socially and culturally diverging* making them more difficult to accept and practice.

Of course this problem is a lot more complex than presented here. The idea is not to give an exhaustive review and comparison of these different practices and their suitability in specific situations, but to give an idea of how culture influence the way we choose to cultivate the land. How culture can be both an access and a limitation in creating truly ecological, locally adapted production system instead of halfway hybrid systems, with one foot in a conventional paradigm and the other in agroecology. And finally that this in turn *creates systemic problems that express themselves as lacking manpower.* This could be said to be an example of the coevolutive way of looking at agriculture that exists within agroecology or, if you whish, soft systems thinking.

4.4.4. Issue 4. Motives for not entering or for leaving the agroecological process

After the first round to the farmers I came to understand that I had to separate the act of;

a) Leaving the ecological way of production from:
b) Leaving the group.

There are cases where farmers leave the groups but continue their ecological farming. I also heard of a few examples where a family produce ecologically but never entered the social organization in groups. With the wide understanding of what the agroecological process means defining entering and leaving hence becomes problematic. Is it still agroecology if you "only" produce ecologically but do not participate in a wider social and political process of reflection and action? Considering that this is an ongoing hot debate between long term actors within agroecology, I will not attempt the pretentious act of trying to give a definitive answer to this complicated question. Instead I will mention different situations as they have been explained to me. When entering or leaving is mentioned I refer to the agroecological groups associated with Cetap.

4.4.4.1. Not entering

Most motives to why not everyone enters the agroecological process have already been mentioned. The farmers believe that the biggest reason is

a) An individualistic and materialistic worldview where higher profit is the goal.

Other reasons mentioned are;

b) The view on agriculture as a job and not a way of life
c) The view of agroecology farming as;

- Lazy and underdeveloped or
- Stigmatized as belonging to leftwing parties or movements.

I personally believe that these are stronger reasons basically because the most common reasons to enter the agroecological process seem to be improving ones health and economical situation. Reasons coupled to the individual and material standard. I have been told that some people even entered believing they could earn a lot of money.

Other reasons mentioned for not entering the agroecological process was that;

d) At times the groups for different reasons were closed for or restrictive with new members.

The cultural factors have already been discussed and the ecological farmers are well aware of them. Many have expressed that;

e) Society cultures ideas and values that support conventional agriculture and not ecological.

4.4.4.2. Leaving

I believe that the above mentioned materialistic and individualistic reasons might play a bigger role for leaving the agroecological process than for not entering. When basic health and livelihood problems are solved and/or an opportunity of earning more money seams to appear then some chose to leave the agroeocological process. These opportunities have taken various forms;

a) Rising price on soy beans,
b) A company offering contract production of e.g. tobacco or eucalyptus,
c) An opportunity of doing non-agricultural work etc.

Then again, every now and then when the conventional agriculture runs into a crisis (e.g. low prices on products, high prices on inputs), agroecology rises in status and more people are interested to try. This was the case during my stay in Brazil. During my stays with the farmers I sometimes came into spontaneous conversations with conventional farmers. It could be neighbors or relatives of the farmers I visited, people I met in the local store, at meetings etc. After two years of prolonged summer drought combined with minimal prices on soy bean and corn made them consider an agroecological alternative.

c) The systemic problems that arise from not prioritizing the ecological production on the farm and creating hybrid solutions mentioned earlier are also given as motives for desisting from the ecological practices.

Maybe the biggest difference between the two groups in this sense is the amount of different motives for desisting in ***Ibiraiaras*** compared to Vaca Morta. There could be different explanations to this. It could be that proportionally more people desisted in Ibiraiaras. It could also be due to the fact that the group of Ibiraiaras is spread over a whole municipality while the other group is limited to two neighboring villages Vaca Morta and Cosilha seca. Hence there are more people involved and conditions vary more in Ibiraiaras.

In ***Ibiraiaras*** there are several *big actors present on the agroecological arena*. The Rural Workers Union (STR), the Small Scale Farmers Movement (MPA), the Women Rural Workers Movement (MMTR), Cetap and the ecological group are all active while in ***Vaca Morta*** the group has worked a lot more on its own. The presence of several actors opens up for the possibility of cooperation and actions of collective strength, but also for more;

d) Conflicts, hierarchy and power play.

This is probably the reason to why conflicts within the group and between the group and other actors are more present in the decision to quit the group and sometimes consequently also the ecological practices. Other reasons mentioned are;

e) Feeling the lack of sufficient technical guidance since the help from the union advisor stopped.
f) Lack of support within the family.
g) The work with the ecological market is too demanding or expensive (since there are so few families left in the group).
h) Greenhouses destroyed by the wind are common examples.

Someone also mentioned;

i) Rules of commercialization imposed by Cetap without support from the farmers.

It seems that the group of ***Ibiraiaras*** as compared to Vaca Morta has experienced more;

j) Top down approach

Both within the original small groups within villages, and the later between the collective group and other actors. It also appears that in ***Vaca Morta*** there is a stronger tradition of confronting the problems. While in Ibiraiaras there is a more;

k) Let go attitude.

To some extent this might be explained by the fact that it is more difficult to confront problems when there is a bigger difference of hierarchy. But I also found this tendency of not dealing with the problems within the small groups that existed at the start of this process.

In ***Vaca Morta*** there was also a case of;

l) A member being expelled from the group when a family member used pesticides on the farm.

4.4.5. Issue 5. Facilitating Factors

In Vaca Morta the group feels that;

a) The community is increasingly accepting of their vision of agriculture and rural development.

They even feel that more and more people at different levels are acknowledging their work.

b) There are more funds for agroecological work today.

At the same time previously strong actors have been decreasing in their strength and presence; STR, Cetap, Pastoral Youth and the Pastoral Commission on Land.

Both groups valorize Cetap and see them as their right hand. Activities supported by Cetap that are highly valued are;

c) Courses,
d) Study visits,
e) Own experimentation,
f) Opportunities to exchange experiences and ideas with each other,
g) Accompanying from the technicians and
h) Participatory development.
i) Meetings are good but too many of them take to much time from farm and family life according to many.

Another important facilitating factor is;

j) The technician.

Many farmers both in Ibiraiaras and Vaca Morta think very highly of the role of the technicians for the process of agroecological transition. They are the ones truly on the farmer's side. They give advice, motivation and a feeling of security to take risks and try out new things. They are seen as somebody who should come to the farm and give advice on how to run it. It is understood that the technicians also have other roles to accomplish but these are less valued. The absence of technicians as farm advisors are often mentioned as reasons for failure or even for leaving the ecological farming.

Within the Cetap team some believe that what the farmers mostly need from the technicians is motivation and moral support more than technical guidance. They need this because they are constantly questioned by others. But there are also those within Cetap that give more importance to the technical part. Some believe that the agroecological transition will have difficulties in advancing without the constant presence of the technicians, independently of if it is their moral or technical support that is most needed. However they all know that they as technicians have many different chores and have to reach out to a large amount of families. Because of this and because they believe in the empowerment of the farmers they believe it is important for the farmers to be much more independent of the technicians.

The STR and MPA on the other hand have with time given less priority to the role of the technician and concentrate on influencing public policy, mobilizing funds and increasing public consciousness about their reality.

The local team in Alto Uruguai believe it is of great advantage if the technician knows and participates in the everyday life of the farmers. Their role is to motivate, support, and help solving conflicts as well as work for an external agroecological transition.

Decisive for the facilitation of the agroecological transition is;

k) The role of the local community and actors.

The fact that the group of ***Vaca Morta*** is concentrated to one village seems to be a positive factor. Within a village you need to get along well. In Vaca Morta the ecological groups is a part of the Association which includes a majority of the villages. This gives a sense of belonging and strength. The association is highly present in their life and the fact that it still works so well is attributed to how it was created. It was a slow, participatory and careful process. Many possibilities were analyzed from different perspectives. The facilitating role of Cetap in these discussions is given a lot of credit by several farmers. Cetap also believes that the many sensible and talented leaders in the group have contributed to this outcome. The group has always fought within itself but they seem to have a very effective conflict management. Many told me that they felt comfortable in speaking their mind within the group and those professional arguments did not continue in the everyday social life of the village. The process of decision making is long and implies repeated discussions at meetings and at home before the final decision is taken. They strive for consensus.

The importance of this open discussion, participatory process and conflict management becomes very clear when we compare Vaca Morta with ***Ibiraiaras***. Here many actors have complained on a sometimes top-down approach, informal decision making and a lack of conflict management. This might have contributed to the existing conflicts. There are also more actors on the scene which might be a strength but also makes cooperation more difficult. Further the group is scattered all over the municipality which makes cooperation more troublesome and expensive. They also lack the advantage of the sense of belonging and support within their village. Ibiraiaras is an area more adapted for agribusiness and therefore offers a variety of work opportunities from national and multinational corporations. This is then close at hand when problems arise with the ecological farming or cooperation.

In ***Ibiraiaras*** Cetap is also highly valued. Other actors with a positive influence are the Rural Women Workers Movement (MMTR), some mention the STR and MPA, the association called União Faz a Vida and the school of Padre Aleixo, which has agroecology as its motto, are mentioned as positive forces. The villagers normally do not give their opinion but there are cases of both positive and negative attention. The ongoing crisis in conventional agriculture seems to provoke many to change their concept of ecological agriculture to a more positive one. In ***Vaca Morta***;

l) The quality of the soil is favorable as compared to Ibiraiaras.

Vaca Morta is also;

m) Closer to a big city, Erechim

The closeness to a big city is favorable for commercialization.

Finally;

n) Group work

Is mainly perceived as a big advantage in the agroecological transition. The perception on group work does not differ substantially between the different actors but they do have different experience of this work. The different methods used and difference in the overall situations that the two groups find themselves in (mentioned above) has resulted in major differences in the success of group or cooperative work.

Even though group work or cooperation may be exhaustive at times and often requires personal compromises the farmers all seem to believe that it is necessary. In the area of production the experience with cooperation has given mixed results. Most farmers seem to be somewhat skeptic to cooperation in this area. To some extent it is good for example investing in certain expensive machinery or materials together. This gives the advantage of economy of scale. However collective work in the production itself has shown to be complicated both at a personal and logistic level. *Cooperation in the commercialization* though has given outstanding results. This *saves time, money* and gives an *opportunity of exchanging ideas and experiences* with both other farmers and consumers. It is as much a social as a business event. Selling and talking about your products at the market in the city is an experience that *raises the self-esteem* of many farmers, especially women. Some farmers had never gone to the city before. Many mentioned the *feeling of belonging or union* thanks to the group.

Cooperative commercialization is also interesting from a biodiversity and market supply perspective. If many farmers from different places participate in the supply of products to the market then the *quantity and continuity of supply is more secure*. If harvest fails at one place it might succeed at another place for example. Farmers have *different knowledge and different talents* which can *increase the quality* of the products. Since the farmers find themselves in areas of different biogeological conditions they have the possibility of growing a *bigger variety of crops*. And since they are many they can *maintain a biodiversity on each farm* and still produce enough of each product for the market (instead of specializing which contributes to monoculture). Another interesting effect is that a *natural participatory control* occurs when producers are more involved in each others farms. This is also a part of the participatory ecological certification process developed within ECOVIDA.

The local team in Alto Uruguai put emphasis on the benefits of group work for a *better reflection upon ones work and surrounding world*. The social self-control within the group is also mentioned. An important factor, according to the team, is the fact that cooperation *enables many families to participate which normally would not afford or have the necessary infrastructure to do so*.

The Cetap team emphasizes the group work as a *social process*. It is also *practical for the technicians* to work with a group instead of individuals. Once again the advantage of *economy of scale* is mentioned as well as the *empowerment* of the farmers, their increased independency of the technicians thanks to the interaction between them.

But they have noticed several *tendencies that point away from group work*; Increased individualism and less need for group work in the society. Since collective work within a community is getting to be rarer the multifunction of a group disappears making it less worth while. Less farmers participating increases the distance between participants which make the group formation less natural. The groups do not have many other things in common than work, as they would have if the group was formed by a part of a village for example. There is also a political stigma over cooperation or collective work which limits the range of people interested in participating. Cetap believes that certain changes in their methodology could have contributed to a better group work; emphasis on gender issues, less meetings, a better bottom-up approach and more work with participatory techniques which would make all voices heard, not only the strongest ones.

MPA in Ibiraiaras also mention that *ecology does not know the limits of a farm* and hence should be a collective work. They believe that the difficulties of group work are caused by lack of consciousness or individualistic aspirations of becoming rich.

4.4.6. Issue 6. How to strengthen agroecology / what would they do differently today?

When asked what the farmers believed would strengthen the work with agroecology they mentioned;

a) More accompanying by the technicians,
b) More families participating in the group,
c) Better organization of the production for the aim of commercialization,
d) Understand that ecological production is not only horticulture products and greenhouse but also the rest of the farm.
e) Developing appropriate machinery,
f) More manpower,
g) Government support,
h) Secure market,
i) Better prices,
j) Support from the family,
k) Consciousness rising.

With other words, there are a lot of things that can and need to be done.

When asked what they would have done differently if they could do it all again the farmers in ***Ibiraiaras*** had several different ideas;

a) Some think having a mediator would have helped, as would
b) A bottom-up approach from all actors.
c) Facing the problems instead of ignoring them,
d) Facilitating for more families to participate,
e) Be more consequent,
f) Putting the whole farm and not just a part of it in agroecological transition.

Some also thought that it would have been better to;

f) Start with small steps and secure the water access instead of big infrastructure changes.

Others believed that;

g) Focusing on one product first and then diversify would have been good.

Several mentioned that;

h) Learning to produce without greenhouses would be important.

In ***Vaca Morta*** the farmers mentioned;

a) Government subsidies (irrigation, green houses, reforesting),
b) Acknowledgment,
c) Better infrastructure at the farms,
d) Water access
e) Manpower (e.g. paid by the government),
f) Appropriate machinery
g) Lower commercialization costs.

Some of the technicians mentioned that there is a lack of consumer initiatives to relieve the farmers from some of the work that needs to be done. This could be motivated by;

h) An increased rural-urban relationship.

But several farmers are skeptical when it comes to paying intermediaries in the commercialization. Partly because they are insecure of if the money will be wisely and honestly used. This skepticism was something I also took notice of.

Chapter 5. Final workshop with participants of the study

Before leaving Rio Grande do Sul for Sweden I organized a day of presentation and workshop about the study in the two regions. All participants were invited. In Vaca Morta the participants were farmers, the president of the farmers union, technicians from the Alto Uruguai project, Cetap and university students from Erechim who had made a study about rural development possibilities in Vaca Morta. In Ibiraiaras representatives of the farmers, the Union, MPA, Women's Movement and Cetap participated. The first part was a presentation made by me of how agroecology and transition was understood by this study. At the end I presented the imaginary family mentioned earlier.

The presentation was highly participatory which made the step over to the afternoon workshop natural. The starting point of the workshop was a brainstorm. Everyone was to mention what they believe the imaginary family would need in order to be successful with their ecological farm. Before the final workshop I prepared a list of seven important elements needed for the agroecological transition based on the study. The elements are presented in box 1 as they ideally should occur to strengthen the agroecological process. When no more new ideas came up the words from the brainstorm were compared to the list of seven important elements I had prepared earlier. All the words fitted into the themes so there was no need to create complementary themes. I presented each theme and it was discussed during the presentation.

Box 1. Important Elements for the Agroecological Transition

a) Knowledge

Knowledge is important for us in order to be efficient and to be sure that our practices do not harm others or the environment. Knowledge is not only receiving information. Information needs to be processed to be understood. This can be done by reflection, association to our individual realities or experimented with at the farm.

Time is a limiting factor for the farmers so the moments of knowledge acquisition should take the form which is favored by them. It is clear that visiting each others farms and other study visits are highly valued. Meetings and courses could be combined with these activities to gain more participation. For example courses during a study visit or group meetings localized at farmers farms. If farmers within one group would have more opportunities to visit each other a lot of knowledge and experience could be shared. The lack of this was very clear in e.g. Vaca Morta where some of the pioneering and very competent seed producers are in the same group with participants who do not even know how to produce their own seeds.

Care should be taken so that the knowledge is relevant to the farmers. For example courses etc could join farmers from different groups but with similar farm situations or interests instead of addressing each farmer group separately. The groups are heterogeneous and not everyone will find the course interesting.

Learning how to do effective experimentation at their own farm would raise the self confidence of many farmers and make them more independent of the technicians. With increased contract production and specialization this genuine farmer skill seems to be disappearing.

Practicing how to express what you know how to do and the things you wonder about could also increase the potential of learning from each other. In a study by Freitas (2004) most farmers expressed high appreciation of the courses in communication offered to them by Centro Ecológico[36]. Investing in relevant books within the group and perhaps even study them in study circles within the group could also increase their independence of technicians. Books could be red at any time available to the farmers instead of requiring them to attend a course at a certain time.

b) Family Subsistence

It says itself that the ecological production must offer a good subsistence for the family if it is to exist at all. A balance between production for own consumption and sale is important for the planning of the farm. The situation where the ecological part of the farm is sustaining the conventional one or vice versa should be avoided. This is not sustainable in the long run. A calculation of the costs and incomes from each activity will help to get an overview of the farm and to make better production decisions.

[36] Centro Ecologico is a NGO working with Agroecology in the northeast of Rio Grande do Sul.

Producing for home consumption offers cheaper products and most often a higher quality. The diversification of the farm must be functional though. Perhaps everything needed cannot be produced at the farm. Are there locally available and acceptable alternatives? Can it be solved within the farmers' cooperation?

Things that are desired but not produced on the farm can be bought with income from several possible activities; selling food and other products (natural medicine, art, biodiesel, wood etc) produced at the farm, small scale agroindustry can increase the value of the product. The option of selling services should not be forgotten; eco- and agro-tourism, courses, consultancy, organizing events etc. The habit of exchanging goods and services could be further developed including other villages and city people.

Another kind of income can be government financing by reduced taxes or different kinds of subsidies. This option is getting better but there is still a long way to go. A big step forward would be if laws of the processing of agricultural products would be adapted to the conditions of small scale family farmers. Today the rules are adapted to large scale industrial production which is much different from the small scale one. These rules often make it impossible for farmers to sell their products. Many argue that since ecological farmers contribute to a better environment for all citizens than a partial government financing would be fare. Especially since there may be high initial costs involved.

c) Social and Cultural Acceptance and valuation

For us to accept and value something we need knowledge about it but, a personal positive experience of it makes our commitment more genuine and long lasting. For us to feel the responsibility to take care of nature and our environment we need to feel comfortable with it and at home in it. We need to learn to appreciate it and know how it functions.

An ecological farmer is a part of a system and is thereby dependent on the support of that system. The system could be the family, community or society in general. If the family supports and contributes to the ecological farming and the society helps out with for example subsidies, laws, infrastructure and consciousness raising the potential of the farmers multiply. The opposite is also true. The less support the less strength and possibilities to continue to find sustainable solutions.

Therefore it is essential to create support systems in the agroecological transition. Weather it is the family or society. To do this we need to fight for our rights but also work with our knowledge, values, visions and habits.

Individualism is often mentioned as an obstacle in agroecological transition. Fulfilling our own needs and wants without considering the consequences to nature and others is a part of the problem. Solidarity and an interest in how things are connected in nature and society, in how others experience their reality, is part of the solution. Many mention that a willingness to work is necessary. As is democracy and empowerment.

Earlier in the study it was shown how our culture influence the direction of agricultural development. Ecological agriculture needs to be envisioned as modern development, intelligent and not old fashion and lazy. This is best changed by increasing the knowledge about the mechanisms of nature and how ecological agriculture tries to cope with that. We need to redefine what success and development is. Habits like what we eat, how we cultivate the land etc are difficult to change but need to be revised in the light of agroecological transition.

In practice, on a local scale, this may be achieved by working with the families internally and with whole villages and municipalities (schools, municipal authorities, companies etc) instead of individuals. On a larger scale networks and government authorities should be addressed.

d) Personal and Family Motivation

Personal and family will or desire to engage in the agroecological transition is crucial for it to occur. This desire increases with more knowledge, acceptance from the society and if it results in certain benefits like improved health, better subsistence, pleasure, more liberty and increased productivity.

Knowledge and acceptance from society has already been considered. Improved health normally occurs within agroecology due to; elimination of pesticide use, more varied and healthy diet, more varied and easier work, more time off, less stress thanks to a more secure basic subsistence.

The subsistence is more secure since it is less dependent on outside actors and single crops. The agricultural practices use resources in a sustainable way which secures the productivity of the farm over time.

Pleasure is achieved by creating a safe and nice environment to work in, by liking the work performed, the possibilities of making friends, get to know new places and things and getting appreciation for once work

The sense of liberty is very important. Not having a boss or schedule to follow, being independent. This might be especially important for women. If their sense of liberty increases it may be a partial key to decreasing the depressions and wishes to move to the city more common amongst women.

e) Power

To have power over ones life there must be forums for participatory democracy. These forums must be organized in such a way that they do not exclude parts of the community, for example women. Certain rights must also be acknowledged by the society. Some are already recognized and only need to be fulfilled, other need to be fought for. Finally the more independent the farm is the higher the level of the families control over it and their lives.

If everyone participates in formulating the problems and finding the solutions they will be better accepted, of higher quality and more responsibility will be felt for decisions and actions taken.

For the participation to be true a bottom-up approach as well as an open and safe environment is a must. There must be methods which secures that everyone will speak their mind and participate in the decisions.

The timing, length and location of participatory meetings and courses are decisive for who will participate and who will not. Long transport might be too time and money consuming for some. Certain hours of the day or days of the week are inappropriate if full participation is to be reached. For example women will not stay too late at night since they are the once who usually put the children to bed and wake up early to get them off to school. The time for milking the cows is not a very good time either etc.

f) A plan

A transition is a movement from one state to another. This movement is facilitated if we know the point of departure, the point of arrival and then decide the easiest way to get there.

The point of departure is the state that the farm and family find themselves in at this moment. There are several ways of defining that state, making a diagnosis. The important thing is for it to be participatory with the family and perhaps with the facilitations of a technician and/or other farmers. Both hard facts as; size of the farm, what is grown, climate, income, input etc and soft issues like; family interests, preferences, activities, life situation etc should be included.

Next step is visionary. Where would the family like to see themselves and their farm in the future? What are their hopes and dreams? Are there differences of ideas within the family? How can this be solved? Are there any uncertainties? What information is needed to decide about the future?

After this visionary step a more practical approach is needed. A concrete goal is set a few years ahead. An as detailed plan as possible is made to of what needs to be done year by year to reach that goal.

Of course these steps will not be as straight forward as presented here. The steps can take various forms and different methods can be used to facilitate them. Probably there will be a jumping back and forth between the steps. Consideration should be taken of the unpredictability of many inside and outside factors. The best way to do that might be by taking small but well thought and planned steps. Many in Vaca Morta believed this to be a part of their success. In Ibiraiaras several persons whished they had taken smaller steps.

g) Cooperation
The benefits of cooperation have been thoroughly described elsewhere in this study. Some benefits are easily measured like; cutting the costs, sharing the workload, improving the environment in a larger scale and several benefits within commercialization and biodiversity. Other benefits are more qualitative; the feeling of unity an increased strength to overcome difficulties, the sharing of knowledge and experience and friendship.

For cooperation to work there needs to be a clear division of responsibilities. Problems and conflicts will occur. It is then important to have an approach and methods prepared to deal with those situations. Ignoring this may end up in a situation very difficult to do something about. Willingness to compromise, control and transparency is also essential. It is crucial that the participation is true. This means creating the cooperation in such a way so that no one will be systematically excluded from participation, that everybody's voice will be herd (not only the most confident and well articulated). Having secured that, a certain level of participation should be required so that everyone will be the co-creator of the actions and decisions taken (see headline Power).

After this presentation and discussion there was no more time for a separate discussion on how this ideal situation fitted into their reality and what could be changed. Instead every participant was asked to individually write down what they believed to be the 3 most important elements for agroecological advancement. One, being most important and three, least important. Each one presented their order and in Ibiraiaras comments were given to why they chose those themes. In order to rank the themes they were first weighed. Each theme was given points depending on the number of times it occurred at each level of importance. The most important level gave 3 points, next 2 points and least important 1 point. Example; the theme *personal and family motivation* occurred 7 times under the most important level giving it 7x3 points. It also occurred four times under level 2 giving it 4x2 points. Summing all up the theme got 29 points making it a winner with rank number 1. In Vaca Morta the participants were also asked which of these themes they speak most of at home.

Table 7. Brainstorming and Ranking in Ibiraiaras

No	Theme	Brainstorm words	Weighed votes	Rank	Comments to ranks
1	Knowledge	-Knowledge. -Education. -Biofertilizer know-how. -Consciousness. -Conserve natural resources. -Creativity	7,5	3	-Once you have the desire to do this you search for the knowledge.
2	Family Subsistence	-Access to natural resources (water)	1,5	7	
3	Social and Cultural Acceptance and Valuation	-A vision	5,5	4	-Important to have support. -Need to change our culture.
4	Personal and family motivation	-To want it -Creativity -Courage -Prioritize ecology. -Challenge yourself. -Take an active interest	29	1	-Many comments similar to: without this all else fails. -Have to desire to do it.
5	Power	-Organized, collective fight for ones rights.	4	5	-Democratic participation is very important.
6	A plan	-Rethink/design the farm. -A vision -Plan the ecological farm as a whole. From basic needs and potential. Define goals. -Think of food processing.	3,5	6	-To know exactly what it is you want and how to get there.
7	Cooperation	-Organized fight. -Discussions in group	18	2	-Diminish costs. -Independence. -Not being egoistic, independence is for all. -Changing the environment requires collective efforts.

					-Exchanging ideas and experiences. - When the people are organized everything becomes easier. - We might try to avoid it, we could have moments with less cooperation but it is necessary for our survival and survival of the planet.

Table 8. Brainstorming and Ranking in Vaca Morta.

No	Theme	Brainstorming	Weighed points	Rank	Most spoken off at home Weighed p	Rank
1	Knowledge	- Knowledge - Search for new technology. - Believe in it - Technical support.	24	1	8	1
2	Family Subsistence	- Subsidies for investments. - Commercialization channel.	12	2	4	2
3	Social and Cultural Acceptance and Valuation	- Insurance - Commercialization channel. - Better contact with urban areas - Belief	8	3		
4	Personal and family motivation	-Commitment! - Independence - Will and interest of the family - peace and quiet	0	0		
5	Power	- Minimal capacity of producing internal inputs. - workforce - Independence - Participation	0	0		
6	A plan	- A minimum capacity to produce internal inputs.	7	4		
7	Cooperation	- Cooperation - Improve the relationship with urban areas - Technical support	5	5		

At the end of the workshop an evaluation was made of the time I had spent with the farmers as well as this last day of presentation and workshop. The response was overwhelmingly positive.

5.1. Some Comments during the Presentation

- *If schools say ecology don't exist then what does it matter what us parents say!?*
- *We need a support system. The head does not manage to resist a development model that is imposed with such a force. When we try to do something different then our neighbors laugh at us!*
- *The question is should we wait for the world to change before we change or should we change the world. By ourselves it is difficult but together we can manage to resist and find new ways.*
- *The state of Paraná managed to forbid GMO! We must come together and influence our government too!*
- *The technicians of the big corporations they come prepared. They have thought of it all…new car, nice clothes, always good looking, presents for our children. They think about all this….but we sometimes do not.*
- *The [developmental] model offers; first of all comes money then the rest will solve itself. That is their philosophy and priority.*

5.2. Comments during the Imaginary Family Presentation

- *There should be at least one of these family members working in town already. Too many people to support on that land.*
- *There is a lot of insecurity, which in turn results in solutions as cows for milk.*
- *But is the investment in milk long term sustainable for this family considering the size of their farm? Will they change activity after some time? Because if it is not well managed it will eventually destroy the soil.*
- *They are in the power of the milk companies….they always want more, give a better price to those who produce more.*
- *It seems that the family does not know what to do anymore…they go for milk but are thinking of tobacco…*
- *Some say that there is a lot of insecurity and that is why they opt for milk production. But what is security? The milk companies? For how long? We need to rethink that concept.*

A long and important discussion starts on what is security; monthly pay from a contract company that may change the rules, prices or leave at any time? Or an initiative controlled by themselves. This is not a simple question. Especially, when experiences of their own initiatives sometimes have lead to difficulties and conflicts.

5.3. Comments During the Final Evaluation:

Many participants expressed their appreciation of me bringing back the knowledge of this study to them. No one else had done that before, even when they specifically asked them to do so. They thought it was important to get an outsiders view on their situation. Most also mentioned that the time we spent together in the families was important.

- *Your stay with us and this presentation has been an important experience. We have learnt a lot.*
- *It would be good if we could continue this work so that it will not only be words but also some change in practice.*
- *It has been an important motivation for the family.*
- *Good discussions*
- *People from around, other than family, were also influenced and gave more importance to the ecological work.*
- *Should have these themes put up on the wall at home so we do not forget in the daily rush.*
- *It has been an important moment for the families you visited. To get together and reflect. We became motivated to challenge ourselves, to not only talk but also do more. People that influence the family liked the visit and have changed their view [on agroecology] somewhat.*
- *Many of the things we already knew but today we saw that we lack personal will, we need to challenge ourselves more.*
- *The presentation was easy to understand and interesting.*
- *It was very courageous of you to come, see and tell what you saw. You invented a family representing what you saw. This during a moment when many families are uncertain, thinking of contract production…etc.*
- *We were afraid it would be difficult to understand each other and that the children would bother you. But it all went very well we learnt a lot!*
- *Many essential issues were brought up.*

Chapter 6. Conclusions

During the presentation of the study area in this thesis agroecology and transition was presented under separate headings. I chose to separate the two in this study because the separation exists in the literature and in many people's minds. This was also true for me at the start of this study. I suppose that this separation originates from the process of converting the farm to fulfill the requirements of organic certification for marketing purposes. In this study however it has been shown that the horizon of agroecological development can go far beyond a simple market certification (eg, Kathounian 2001:285, Carporal & Costabeber 2004, Cetap 2006a). It has been shown in the study that scientists, Cetap and many farmers do not see agroecology as a steady and defined state. An example of this is the theory of coevolution that exists within agroecological thought (Altieri 1995:26). Carporal and Costabeber (2004) described it as a continuous process. Another is the technicians view on agroecology as a new relationship between people as well as between people and their natural environment (4.3.2. Technicians). The agroecological path or process will and should also be different depending on local specific natural and social conditions (Guzmán *et al* 2000:104-105). It is an approach and a process in a dynamical ever changing world. Thereby there cannot be any point in time when a farmer or society becomes entirely agroecological. If agroecology is an approach and process instead of a steady defined state there cannot be a transition to it. Transition is an intrinsic part of agroecology which could be defined as; *Agroecology is a way of understanding and approaching the rural situation. By the help of the underlying premises and basic principles it helps us to develop a strategy of how to coevolve in a sustainable way with our natural and social environment.* The fusion of the two concepts is an important conclusion of this study.

When looking at the history of the agroecological transition in the two groups one can easily conclude that it is a lot more complex than the steps mentioned in the literature review in chapter 2. Those steps were to increase the biodiversity while;

1. Reducing pesticides,
2. Exchanging chemical inputs for biological and
3. Redesigning the farm.

This is a very biological and technical view of the process. Guzmán *et al* (2000:81-82) showed that social issues entered the agroecological thought in the 80ies. And the various authors in the literature review mention softer issues but more or less in the marginal or as separate aspects not included in the transition. Is this perhaps also caused by a mental picture of the ecological transition as something aiming at producing pesticide free, ecological products for a market? This is many times partly true but to reduce the whole agroecological transition to pesticide free products would be a huge underestimation. This study shows that it encompasses challenging ones world view and changing ones relation to nature and other people both in the mind and in practice. It is at its best a change of culture and mentality. And I believe we can agree that culture and mentality does not change by itself. It is a social process occurring every day.

The strong influence of this process is reflected in the interviews. Many speak of the difficulties of finding solutions by themselves, to confront main stream package solutions with a strong mind and critical thinking, the hardship of being ridiculed by others for doing something different, the conflicts that arise and the need for collective effort to make it. To find your place in, or parallel structures within a society which's system promotes something else. The people I have encountered during this study have taught me that the difficulties of agroecology are in this area. The biological and technological solutions are not the main problem. They become a problem when we do not try to change the structures.

In the literature found on the subject the dominating biotechnical view also lacks aspects of organization and cooperation. These are both very essential in the agroecological development of Ibirairars and Vaca Morta. The search for having control over or more to say in the whole production chain is also often not included. Making ecological solutions possible by changing the structure, values, culture and laws is sometimes mentioned. Embrapa, for example, includes it in the external transition. Kathounian (2001:44-45) mentions the different ways of thinking which lead to either green revolution agriculture or ecological solutions. However there is seldom a further exploration of how to accomplish this in practice. If we learn from these groups this work is necessary and more easily done in a group. Within the biological and technological view knowledge acquisition is left to each and one to figure out. Family and group dynamics are given little attention if any. How can we work with the cultural aspects which have a big influence over our decisions? And as already mentioned an intellectual defense, by having more knowledge, against a strongly imposed developmental model should be a part of the transition.

Both in the literature review and during this case study some people emphasize that the strong focus on pesticide free products should be modified to products grown in an environment adapted to the local ecology and social situation. More attention could be given to observe the local environment and try to copy it in ones agricultural practices; what grows best where, animal, insect and plant relations, when is the best time to plant to avoid disease or insect attack, how to recycle energy and material within the farm. The challenge is to integrate the

various dimensions of the farm into a functioning, sustainable agroecosystem. Even if there are many interesting practices and local ecological knowledge at farm level the conscious act of working with the whole environment on a landscape level is often lacking amongst the farmers.

The previous chapters emphasized elements that were found important for the agroecological transition in this study, but receive less attention in the literature. These elements are;

a) Knowledge
b) Family Subsistence
c) Social and Cultural Acceptance and Valuation
d) Personal and Family Motivation
e) Power
f) A Plan
g) Cooperation

With the help of the research findings I will analyze how the two groups voted and discussed these elements during the final workshop. This will allow me to draw certain conclusions about the success and drawbacks of the agroecological transition processes in both groups.

It is important to realize that the answer to the question posed during the workshop: *"what themes are of most importance to this imaginary family for them to advance in agroecological transition"*, will be influenced by how I perceived their reality and then presented it as the imaginary family. But the creation of the family has been a participatory process. The family was discussed and accepted with only a few minor changes. This gives it validity.

What most caught my interest was how different the two groups voted on the themes. Ibiraiaras emphasized *Personal and Family Motivation* and *Cooperation* both during the discussions and the voting. *Family Subsistence* came as last. In Vaca Morta *Knowledge* and *Family Subsistence* was the most important. Both groups thought *Social Acceptance* was important but in fourth and third hand respectively. *Knowledge* came in third place in Ibiraiaras. In Vaca Morta when asked which of these themes they speak of most at home, some changed between *Knowledge* and *Family Subsistence,* but the relation was maintained.

There could be various interpretations of this result. I believe that in ***Vaca Morta*** the focus on *knowledge* is partly due to the fact that they have new members with little experience in alternative technologies. All have cultivated without pesticide but not all have had the opportunities of exchanging ideas, participating in courses and field visits. This difference in knowledge and experience was very clear to me when I visited Vaca Morta. But then there were new members in Ibiraiaras as well? And in Vaca Morta the votes for knowledge exceeded the number of new members? Since I could not see any obvious differences in the knowledge between the groups I believe the reason is that there are stronger forces at play in Ibiraiaras.

In ***Ibiraiaras*** they are confronting a lot more difficulties at a socio-political and perhaps cultural level. Ibiraiaras is a lot more exposed to the modernization of agriculture (rationalization, specialization, mechanization). The social pressure supporting this kind of agriculture and associated culture should be higher than in Vaca Morta. It is thereby harder to resist and believe in another solution. The group of Ibiraiaras is spread out over the municipality so they do not have the support of each other in their village social life as is the

case in Vaca Morta. Several farmers in Ibiraiaras spoke directly or indirectly of this problem. Consequently there has been, and is, more disagreement within the families in Ibiraiaras of how to run the farm, ecologically or conventionally. I believe this is reflected in the voting for the theme *Personal and Family Motivation.* The need for an external (of the family) support to resist and find other solutions is possibly reflected by the votes for *Cooperation.*

There is another important factor that might influence these two votes. In ***Ibiraiaras*** there are more actors on the family agricultural area in general. This could be a strength but it also increases the probability of differences of interests, ideas, misunderstandings etc. It requires a lot of motivation (*Personal and Family Motivation*), rigid and competent work with democratic participation, transparency and conflict management. Things that several actors believed there could have been more of in Ibiraiaras. I was therefore surprised that the theme *Power* did not receive more votes. It is possible that the theme was more associated to a power in relation to the government and companies than between the actors on the agroecological arena. In either way *Cooperation,* in its ideal form, might symbolize the action that gives you the power.

Vaca Morta has also had a lot of conflicts. Many told me *"we have always fought, but we always find a way out and we do not let it affect our social life"*. This competence can probably be attributed to the many good, competent leaders that Vaca Morta has experienced. These were leaders who knew how to facilitate and motivate the group. But it is also undoubtedly helped by the fact that Vaca Morta acts in a more heterogeneous environment. It is concentrated to a small village without any strong influence from other actors. Many members told me that after years of struggle they finally feel at peace with the community as well as comfortable with and secure of what they have accomplished. This perhaps gives them the opportunity to prioritize *knowledge*.

Why did ***Vaca Morta*** prioritize *Family Subsistence*? Perhaps because it is an area more excluded from rural development in the form it has been proposed by the country the last decades, modernization or green revolution. Agroecology then becomes even more crucial for their survival in the rural area. It was also the main motivation for going into alternative agriculture and then Agroecology. In ***Ibiraiaras*** the main motivation was improved health. But why was this theme only mentioned twice and as a third priority in Ibiraiaras? Is it enough to say that a higher level of modernization has made agroecology less important as a *subsistence* option? With the high amount of family farmers selling and leaving for town this explanation does not seem to be enough. Could it be that the ideological pressure is higher, making *Family Subsistence* a too egoistic and less noble motivation? This would need further study for a convincing explication.

Chapter 8. Reflection

Even though the main work of this study was done during the year spent in Brazil, it has taken three years altogether from the start to the end. It has been a great and rare privilege and learning opportunity for me. I have not only increased my theoretical knowledge of agroecology, participatory learning and research and systemic thinking but also acquired practical experience in a real life situation. I have learnt the importance of good planning and communication but also the importance of flexibility and improvisation when theory does not fit reality. I have also gained confidence in my ability of finding solutions to problems as they appear.

8.1. Systemic Thinking

Today my approach to an agricultural issue is automatically more systemic and not isolated and reductionist. I know that there are methodologies, tools and techniques to deal with the complex and interdisciplinary nature of reality. I also understand the necessity of taking on the challenge of managing this complexity. There are no shortcuts for sustainable solutions. Shortcuts will sooner or later end up as failures in one or another part of the system. This is why I believe that some level of systemic approach is necessary in any kind of research and development activity. I have also experienced the importance of the local context. The two villages I visited are geographically and culturally close but even so their situations are different enough to give substantially different agroecological transitions. General laws, methods and technologies are not enough for development. Used in isolation without consideration of the local context they are shortcuts that can lead to undesirable results.

8.2. Participatory Approach

The participation has been highest between me and the Cetap staff. They have participated in the decision of the research area, in choosing other participants and in analysis. The participation with the farmers, union and movement representatives have been mostly on consultancy basis. They have also participated in defining important concepts as agroecology and sustainability as well as partly participated in analysis of the research findings. Through group discussions and workshops there has been interaction between all participants which has taken us a few steps closer to a common frame of reference or platform. It does not necessarily mean that everybody sees the situation the same way but that we all see a little bit more of what the others see.

The greatest limitations have been language and time. My portuguese was poor at the start and even if it improved it did not reach a level were it did not limit my level of understanding. Language is not only words but also mentality and underlying meaning which require a lot of experience to be fully understood. Even though I decided to give this study a lot of time not all participants were able to do the same. Both the Cetap team and the farmers are very busy and could not participate as much as they would have wished. This meant I did more of the work on my own and often needed to take the long way to get something done. On the other hand, time is always a limited and non renewable resource. This being said, they still participated in many important steps of the study and found several of the findings and conclusions interesting. If they would have had more time they could have followed the development more closely, given more feedback and learnt more. It would also have had facilitated my effort to focus on things that are interesting for them in their work.

8.3. My Role

I have known Cetap for several years and met some of the team members on several occasions in Sweden. I believe that they felt at ease with me and trusted me. I was for example allowed to participate at several internal meetings as well as the yearly evaluation. I always felt they wanted me to create my own opinion of their situation and avoided to impose theirs. They are very critical of themselves and used to both internal and external evaluation of their work which they welcome as an opportunity to development.

My previous knowledge of Cetap and agroecology helped my understanding of their view of the situation. My European background and studies of conventional and industrial agriculture at the university helped me to see the situation with the critical eyes of an outsider.

I believe the farmers associated me with Cetap since I was introduced by them. It was probably clear to them that I sympathize with the agroecological development but I always made an effort to show them I was open and critical to make them feel at ease to give their truthful opinion. I was always treated very generously. I felt that I was often told things in confidence and the farmers also criticized Cetap at some occasions. This shows that I avoided to be biased but also that Cetap has a good reputation amongst the participants and they do not fear to be critical. To respect their confidence I chose to maintain the individual participants anonymous in the study. I did this by presenting the information they shared with me under thematic titles rather than divided into each participant.

I believe that as a foreigner and, in their eyes, professional I was given a high status. This automatically gave the farmers work more status in the eyes of relatives, community members and other actors. This was confirmed during the evaluation of the final workshop.

I stayed with the farmers for several days, helped them in their work the best I could and met them at several different occasions. This gave us time to get used to each other even though I must have been some what of a rare phenomenon to some of them. A young woman on her own from the other side of the world, carrying a huge backpack most of them had never seen before, wearing funny clothes and speaking a strange accent. They were very curios of my background and opinions which sometimes made me feel that in fact it was I that was being interviewed, not them. I noticed that if I gave this process a lot of time they became more interested in participating and sharing their ideas. They also felt that they had got something out of our meeting and not only been used to give information.

8.4. Soft System Methodology

I found this methodology suitable after deciding the area of study. This meant I did not know much about it but had to study it already in Brazil. Not having previous experience of the methodology often made me uncertain of how to go about it. I felt that reading a few case studies of how it had been used in an agricultural context would have helped me to follow it better. I could have focused more on the study itself instead of trying to figure out what the different steps meant and how I should practically perform them. I could not get access to suitable case studies at the time I needed it and had to find my own way. The positive aspect was that I avoided following a package of predetermined tools and could adapt the methodology totally to the local situation. It forced me to be creative, intuitive and flexible. The negative aspect was that I had to take a lot more time for the planning of the field period, structuring of the material as well as reflection and analysis. I tried different ways of approaching each step before I found one that felt was feasible. It was a good learning

experience but it took a lot of time from the time I had planned to be in the field together with the farmers and other actors. Having said this I would like to emphasize that SSM with the best preparation beforehand still requires that you get in and do it the first time. In real life it is a methodology that you construct as you go. I have now done it and can look back and reflect.

The first step of SSM is *"Learning about the situation by gathering quantitative or factual and qualitative and subjective information without trying to structure or look for problems. Which are the activities, actors, stakeholders etc?"*. This is a good description of how I approached the study. It started long before the study was thought of when I learnt about Cetap and their work.

The next step is *"Structure the situation by creating a Rich Picture"*. I had great difficulty in creating a rich picture which would contain all the information of the situation. I started out by doing thematic mind maps, the CATWOE with a lot of text and from that made a Rich - Picture. But at this time the Rich Picture seemed so simple. It did not contribute with anything. Looking back I believe that the Rich Picture was in my head at an early stage and I went into too much detail before I finally put it on paper. The result was that it came in too late into the process and was no longer needed.

The third step is "*relevant systems and root definitions"*. It was easy to find many tasks and issues. The difficulty lied in choosing just one or two and working with them without simultaneously working with the other issues which were strongly interrelated. Instead I made a CATWOE (appendix 1) of the whole situation and continued to step four. In my mind the Root Definition was a combination of the Transformation and the Weltanschauung of the CATWOE however I never wrote it down in words.

Step four is *"Creating activity (conceptual) models of the system designed. The model should include all the essential activities which the notional system would logically have to perform"*. I had never seen a real life conceptual model related to agriculture and had difficulty in imagining how it should be made. I translated it into what is needed to realize agroecological transition. Thereby the answer became; knowledge, social and cultural acceptance and valuation, a plan, cooperation, power, family and personal motivation and family subsistence. Each theme had several activities attached to it which needed to exist for the theme to be fulfilled. Today I see that these themes are the relevant systems mentioned in step 3. I came up with these relevant systems or themes but I felt that the other participants also should have a say and give feedback. Was this what they saw as the main tasks or issues? This was made during the final workshop.

Step 5 is *"comparison of the conceptual models with reality or step 2 which is the situation analyzed"*. Although I tried to separate the ideal situation from the actual one (step 4 and 5) it was difficult and at times and during the workshop both situations were discussed simultaneously. The discussion during the presentation of the last workshop very much resembled what should happen in step 5 according to SSM, comparison with the real situation. Meaning that step five occurred before step 4 and then both steps simultaneously

Even though it would be better to achieve a clearer separation between the ideal and real situation I believe that both were discussed during this work shop and presentation. I was surprised over the effectiveness of the imaginary family. It was quickly adopted by the participants and used as a base for many different discussions. It served its purpose and some

sensitive subjects could be touched upon without creating a conflict atmosphere. It is however not enough to solve the truly difficult conflicts.

Unfortunately there was no more time to continue with the rest of the steps; debate on feasible and desirable changes (step 6) and then implementation (step7). Instead the participant voted on which themes (or relevant system) they believed were the most important to focus on and why.

Looking at the whole process, the final workshop could be seen as step three. I had originally planned to have a similar workshop with the farmer half way through the field period. The idea was to include other participants in the choice of relevant systems. This became impossible to organize because of two reasons. I needed more time for the structuring and analyzing of the material. But also, all participants were very busy and it was difficult for them to all meet. There are various other group activities (meetings, courses, market etc) that they are expected to attend at which in the end take too much time from there everyday activities at the farm or other kind of work.

If there would have been more time the final workshop could have been continued with choosing just one or two of the most important themes. From there more detailed activity models could have been developed and continued throughout the rest of the SSM steps. Too many things were new to me before this study for me to go the whole way in one year's time. Even so, I do not see this as a failure. Having this experience behind me will make it much easier for me to learn more about the methodology and plan new studies and development projects. It has been a unique opportunity to learn by doing in a real life situation.

Chapter 9. Recommendations to Cetap

Cetap has asked me to give them recommendations on their work with agroecology based on how I, as an outsider, experienced and understood their situation. For this purpose it is important to look not only at the *past experiences* and *current situation* but also to have an idea of what the *future* will bring about. However in this thesis no methodological tools have been used to create future scenarios. Thereby my recommendations will be based on the past and present situation of Cetap as well as a general, ongoing debate in society about future scenarios.

Cetap have achieved considerable development within the movements, unions, farmer groups and the general society. Even so at times they question their efficiency. The times are changing and they need to change and improve their work. One question they ask of themselves is whether their role is to replace the lacking support from the government to agroecological development or whether their role is to be an avant-garde, an example to follow at the front of agroecological transition. This will of course also depend on the future scenarios *they* believe in and the resources available.

9.1. Future Scenario

Considering the visionary and more independent nature of Cetap I believe that the most effective contribution of their actions would be as an avant-garde. Avant-garde means being at the edge of advancement and development. To be able to focus on these profound changes the work needs to be concentrated to a few settings. A good relationship must be created with participants who are willing to go far in their experimentation. Even if they would whish to act on a larger geographical scale this would be a difficult task considering the limited finances of an NGO.

There is good reason to believe that oil has already peaked and the impacts of climate change are getting more concrete every day. Even though these issues are rising in status on most government agendas it is still questionable if we have time and political will enough to adapt our entire societies to these fast changes. The oil will end and the climate will change whether we prepare ourselves or not. When this time comes there will be a need of working examples of sustainable living, especially food production. This is where I see the inherent potential of Cetap and the people they cooperate with flourish. They will be developers and guardians of knowledge and experience easily accessible when the present and dominating direction of development no longer offers any viable solutions. In the mean time their work will be inspirational and consciousness rising. It will also profoundly improve the quality of life of the people at the settings were they act. At a larger scale not all people that come in contact with their work will immediately practice it. But, it will exist in their minds and when the need appears they will know where to turn.

In order for our living to be sustainable it needs not only technical and organizational tools. Our dependency on our local communities is bound to increase. Hence we will need social and cultural tools to be able to function well within our local communities. I believe that this is a valuable lesson that the groups of Ibiraiaras and Vaca Morta have taught us. Our communities exist within ecological biomes and depend on their geographical position. This means that communities and other actors share the same resources and thereby need to understand each others needs and reach agreements on how to use these common resources. In other words we need to work on a landscape level. Cetap could do this by making a

diagnosis of the landscape situation of the community they cooperate with. They do not need to work with all communities within the landscape boundary with as intensively as with the chosen village. However, where a need is identified other communities should be addressed.

The groups which Cetap has cooperated with were chosen by political and social criteria. This has assured that these soft issues always have been addressed. However, it has limited the potential of working at a landscape level e.g. with water-catchment areas. I believe there is still great potential in working on a landscape (not just farm) level with environmental issues. Environmental issues can be worked with on politically more neutral ground. Thereby they have the potential of unifying people of different beliefs and political preferences in a common effort of improving their shared environment. This is very important since ecosystems are sensitive to fragmentation and need to be worked with on a larger geographical scale in order to be sustainable. Some human impacts are irreversible or can lead to unknown consequences. With today's rate of ecosystem destruction there is no time to lose. Political agreement may still be far away but environmental protection actions must be done jointly already today.

Another scale of action that could need more attention is to work with the dynamics within the family. The study shows that difference of opinion and knowledge within the family often is a limiting factor in agroecological advancement.

9.2. Objectives and Methods of Cetap

My recommendation to Cetap is therefore to work with a limited amount of communities to allow an avant-garde approach in front of the changes we are facing. A systemic approach should guide the work, including the social, physiological and biological factors at community and landscape level. Since not all community members will be equally interested in an avant-garde experimentation it will mean a compromise on the biological and technological advancement. However, looking at the bigger picture it will mean that Cetap can be avant-garde not only in the technological and biological factors but also in the social processes. We will need knowledge and experience in how to cooperate within the whole communities and e.g. water-catchment areas to be able to take advantage of the technological and biological knowledge produced. Since these solutions always will be created in local environments the social process is of great importance.

Cetap have tried to find concrete methods for working in a systemic way. The difficulty has been to find time and money for the team to work on this. I could also see that the advancement into working and thinking in a systemic way is not as common amongst the farmers as within the Cetap team.

As far as there is an interest within the village the whole community should be included. Of course in real life it can be difficult to achieve 100% participation but this should be the goal. The work with the community should always be put in the context of the social and geographical landscape they find themselves in. There will always be a conflict between giving time to work with the landscape or community level on one hand and the family dynamics on the other. I propose that the family dynamics should be given an important role early in the process. The starting point of this more intense work could be when the family designs the plan of transition of their farm. There should be clear goals so that advancement could be evaluated during the process. To maintain this work later in the process methods and

tools of participatory and gender analysis and action could be used. These methods should be used during the work on community and landscape level to assure an equal participation.

To cope with the workload of this mission Cetap needs to cooperate with other existing actors; local government and extension agents, local NGOs, permaculture centers, and companies. To some extent this work has already been initiated in certain areas of Cetaps field of action. Working in these networks also helps to exchange experiences and ideas over a larger area. Local examples spread out over a large area will be especially important when the need for change becomes urgent.

9.3. Education

Another issue discussed within Cetap is weather they should continue with an intensive work with the economy of the farmer families. Or should focus more on education and raising consciousness? The last ten years a lot of work has been done on alternative market development. Cetap feels that this has not been accompanied to the same extent by a political, social and environmental consciousness and action. This could be a weakness in creating long-term commitment and truly sustainable agroecosystems. The study shows the great importance of a personal and family will, knowledge, as well as social acceptance and valuation. Without doubt it is crucial for agroecological development. However if Cetap was to leave the work with commercialization I believe they would lose the confidence of the farmers. Their economical situations are rarely satisfactory and it is highly probable that only the most ideologically convinced farmers would continue the cooperation. This would be a weakness if the intention is to work with whole communities and at landscape level.

The work with consciousness rising and education could be focused to the young members of the community as for example the work that is already being done at the school of Padre Aleixo. The introductory courses that were preformed at Pontao are often mentioned as a turning point as well as a point of reference even if they occurred a long time ago. Several new members have not participated in this course and thereby jump into the middle of an already very advanced process causing frustration and misunderstandings. This kind of introduction is probably very efficient in creating a common frame of reference and direction. It should be accompanied by a more advanced course later on. It would be important to get a wide representation from the community and more than one member from each family. Special efforts should be made to get the women to participate. Moments were the older members of the family can participate would be very beneficial for the family dynamics. A course in expression and communication could be included since it was very appreciated by farmers working with Centro Ecológico.

Even though courses are often well spoken of and give good results the farmers have difficulties in prioritizing time for these courses. Farmers like to see thing with their own eyes and especially things that can be of direct use on their farms. This is probably one of the reasons to why study visits are so popular. A solution could thereby be to combine study visits with courses. For example a morning session with a study visit and afternoon/evening session with course material and reflection. There could also be welcoming ceremonies for new members where a short introduction to agroecology is combined with group or community members telling the story of their agroecological process. All ended with a fest!

For the Cetap team to develop in their agroecological work and to make it possible for team members to learn from each others examples it is important to give time for education,

systematization of their experiences and reflection. Team development and education could be included in the project financing applications. Education could be in the form of literature study circles within the team, longer visits by single team members to other experiences with agroecological work and inviting people with special knowledge and experience to Cetap. Some suggestions of study areas may be; systemic approach to learning and action, group dynamics, conflict resolution, polyculture, methods for working with entire communities and at a landscape level, animal welfare and integration to agroecological systems, methods and tools for working with gender and participatory issues. Every situation is unique and needs flexibility and invention of methods to be locally adapted. However, clear methods and tools to begin with, based on Cetaps common experience as well as literature and other experienced people, would give more confidence to the team members and save a lot of time.

The issue is always to find time for this. I have two suggestions how to achieve this. One is to use interns and university student writing their thesis's for the work with systematization. To advance in the search of effective methods for work with participation, gender, whole communities and other social issues it could be a good idea to invite a sociologist with this experience to analyze their work and give suggestions. The other alternative could be to take such a sociologist on board as a team member. More focus on developing an initial plan for the farms and intense work with family dynamics at this stage might make the farmer families more independent in their process and save the team some time.

9.4. Experimentation and Development of Appropriate Technology

Within the area of experimentation and development of appropriate technology I believe that there are three very important areas that Cetap should focus on; complex agroforestry systems, alternative energy sources and water retention and use.

Agroforestry can be seen as the ultimate way of using the land in the area of Cetap. It was originally covered by subtropical Atlantic rainforest. It is a highly efficient resource use and more stable over time. To convince farmers to experiment with agroforestry it is necessary to overcome the insecurity they may feel with this fairly unknown way of cultivating the land. They need to see working examples, calculations on production and sale, meet people who can tell about their experiences, their difficulties, mistakes and successes. There must be time for the farmers to diminish their doubts. Considering the importance of culture discussed in this thesis it would be important to address the cultural difference of growing in this way.

Alternative energy sources and ways of diminishing the use of energy are not only important out of an environmental perspective. It is also a step in becoming more independent and lowering ones costs. In the face of oil becoming much more expensive it could be a key factor in the sustainability of the farms in the future. With the increasing lack of water there is an urgent need to work with retention and economic use of water. Since water sources are used over a larger area it is crucial to work with this issue on a landscape level.

9.5. Funding and Administration

Cetap is dependent on international and national donor agencies. These give money for different periods of time, different amounts, ask for different ways and frequencies of reporting. At the same time Cetap needs to maintain continuity in their work as well as explain and motivate their way of working to the farmers and other stakeholders. The result of this is of course a compromise. More time is needed for bureaucratic work and less for field

and reflection work. What sometimes seems to be a good solution might be limited due to demands from donor agencies and inability of flexibility within this system.

A solution might be for the various donor agencies to adopt a systemic thinking of how they cooperate with agents in the south. They could cooperate with other donor agencies of the organization in question. This would probably mean institutional changes within each donor agency where increased flexibility would be an important factor. Also the amount of bureaucratic work asked from the field agents should diminish with time as they get more acquainted and confidence rise. This requires a close or personal contact between donor and field agent. One example could be to have a collective meeting at the location of the field agent. Together with representatives of all donors a common agenda would be elaborated. A more frequent contact could be maintained by email, internet conference, and chat at the field agent's homepage.

In order to be effective these contacts and discussions should be kept at a very general level, leaving a lot of liberty to the field agents that best know and have to act within their reality under changing circumstances. The idea is to diminish the bureaucratic work, increase flexibility and find synergetic effects of cooperating in the same direction. However if this kind of cooperation lead to more work, (especially for the already heavy burden of field agents), less flexibility and more bureaucracy the cooperation may be seen as a failure and is of no use.

Acknowledgement

From the bottom of my heart I would like to thank all the persons that made this experience possible! It has taken years to accomplish as well as a lot of effort and good will from many people. On a personal level it has been an important step in my professional and personal development. It has also meant a lot to participants of the study. Thank you the farmers and Cetap members for co-creating this study and for receiving me, sharing your houses, knowledge and experience! Thank you, Birgitta Rämert, for being an excellent supervisor always ready to help and guide me through this study. Thank you, Nadarajah Sriskandarajah, for your supervision and invaluable guiding through systems thinking and action. This study would never have been possible without the help of Lennart Salomonsson at the Swedish University of Agricultural Sciences, the University of Passo Fundo in Brazil, the Sida grant for Minor Field Studies, Stiftelsen C.J. Johnssons fond, PO Lundells fond and NL-Fakultetens Samlingsfond. Thank you for believing in and supporting this project!

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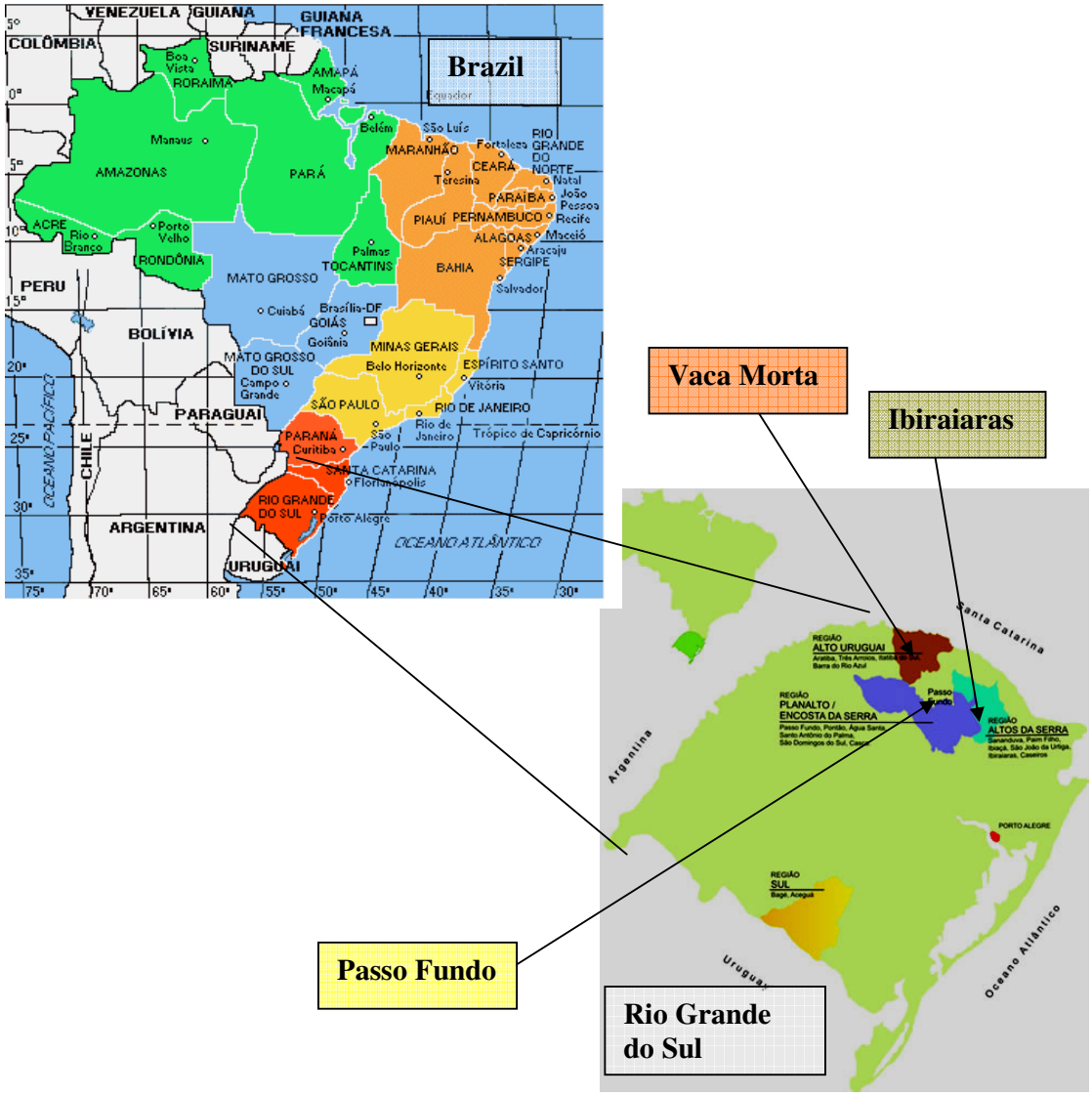
Appendix 1. Map over Brazil and Rio Grande do Sul



Appendix 2. Catwoe example for Ibiraiaras

Clients - (those who more or less directly benefit or suffer e.g. customers) from the machinations of the...
-Farmers, citizens, consumers, industry, future generations, the dynamical balance of nature.

Actors - the players (individuals, groups, institutions and agencies), who perform the scenes, read and interpret the script, regulate, push and improvise. Identify and examine the role of local and institutional actors .... who undertake the.....
-grupo ecológico, MPA, Sindicato, Cetap, (Movimento das Mulheres almost the same as ecogroup),

Transformations .... what processes, movements, conversions of X take place? What is the nature of the production and service transformations? What is the content and processes involved from ingredients to a sandwich, from mixed, varied data to information, from an idea to a performance concept or marketable product etc? What are the transformations that generate a product or a service? How are they achieved? How well are they performing?
-The wellbeing of humans and environment today and in the future in an agricultural context -----→ improved, sustainable

Weltanschauung or world-view .... what is going on in the wider world that is influencing and shaping the "situation" and need for the system to adapt? Alternative definition: what view of the world makes this definition meaningfull?
-Agroecology favours the weak, the environment and health of all consumers (citizens) and in the future while conventional agriculture is not concerned with thee issues and thereby economically, socially and environmentally long term unsustainable.

Owners - the activity is ultimately "controlled" or paid for by owners or trustees. Who are they and what are their imperatives? How do they exercise their ownership power? Are their other stakeholders - who claim a stake and a right to be involved i.e. as legitimate quasi-owners.
-Groupo Ecologico, farmers, MPA – Sindicato, some way Cetap

Environment - the trends, events and demands of the political, legal, economic, social, demographic, technological, ethical, competitive, natural environments provide the context for the situation and specific problem arena. We need to understand these.

Political;
-Laws (many times made with large-scale agriculture as model) sometimes illogical and prejudicative for small-scale family farmers. Subsidies and social security system adapted to cash crop production and conventional agriculture. World bank structural adaptation programs demanding no-protectionism and makes small-scale farmer uncompetitive compared to big industry. Corruption of farmers unions and power play damages agroecological development.

Economical;
-Cooperative favours large-scale prod with bonus system. Bank loans adapted for large scale conventional cash crop production. Wholesalers and big markets pay little and sell expensive. Price dumping of conventional food is a threat. Unreasonably high ecological prices looses consumers – only rich people buy. Ecological production does not pay off enough for many. Direct sale to consumers gives higher price to farmer. Ecological and health crisis in conventional agriculture favours alternatives.

Social;
-Media propaganda supports conventional agriculture. Individualistic and consumption oriented society is unfavourable for agroecology. Pressure from community – isolation. School influence. Church ambivalent or neutral. Increasing awareness of health and economical hazards of producers and consumers favours eco.

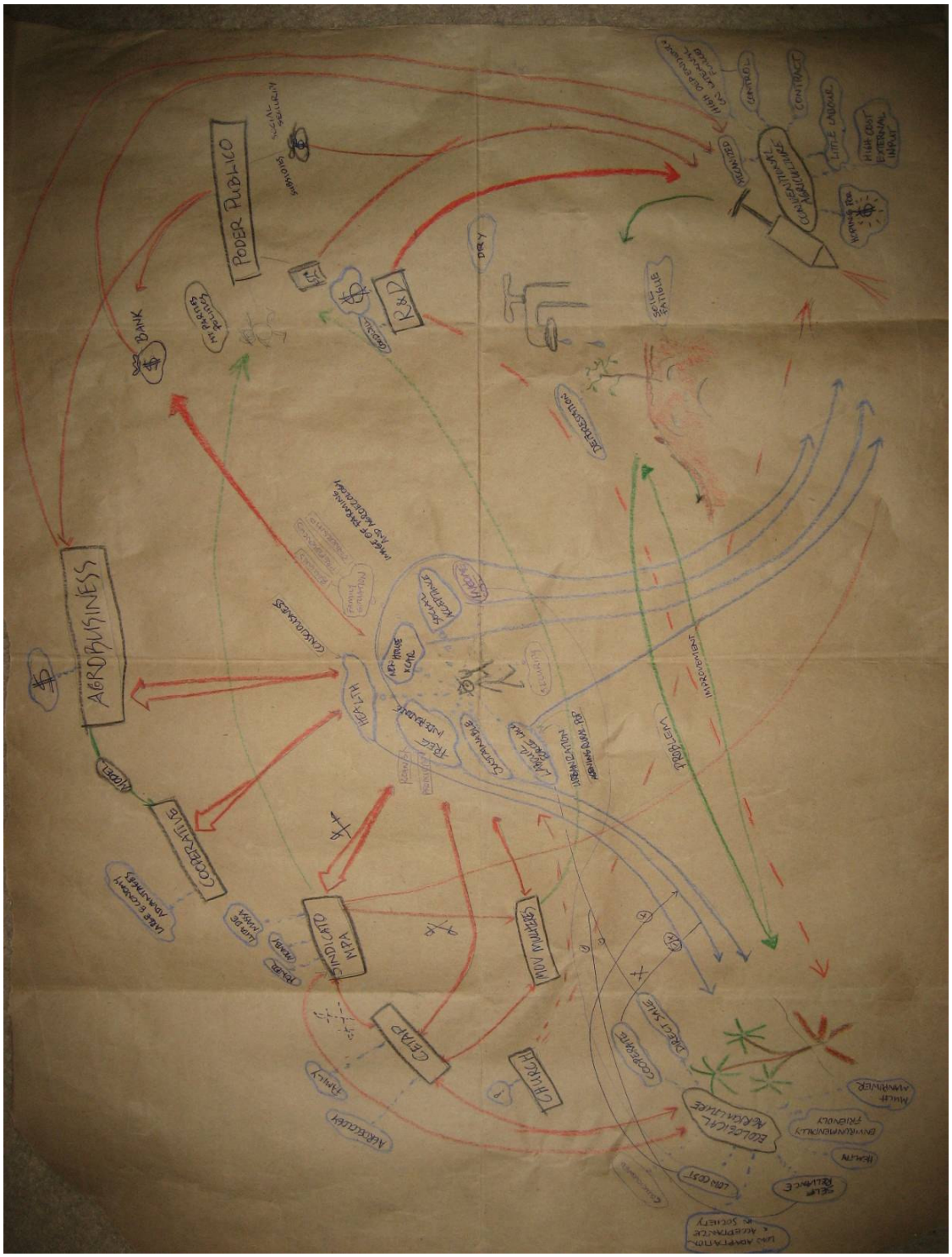
Natural environment;
-degradation; water, soil erosion, deforestation, loss of biodiversity

Technological;
-industry, technicians as Emater and universities (with individual exceptions) not oriented towards a appropriate technology for small-scale farmers; machines, varieties, cultivation practises. NGOs and small scale farmers unions oriented towards ecological small-scale agriculture

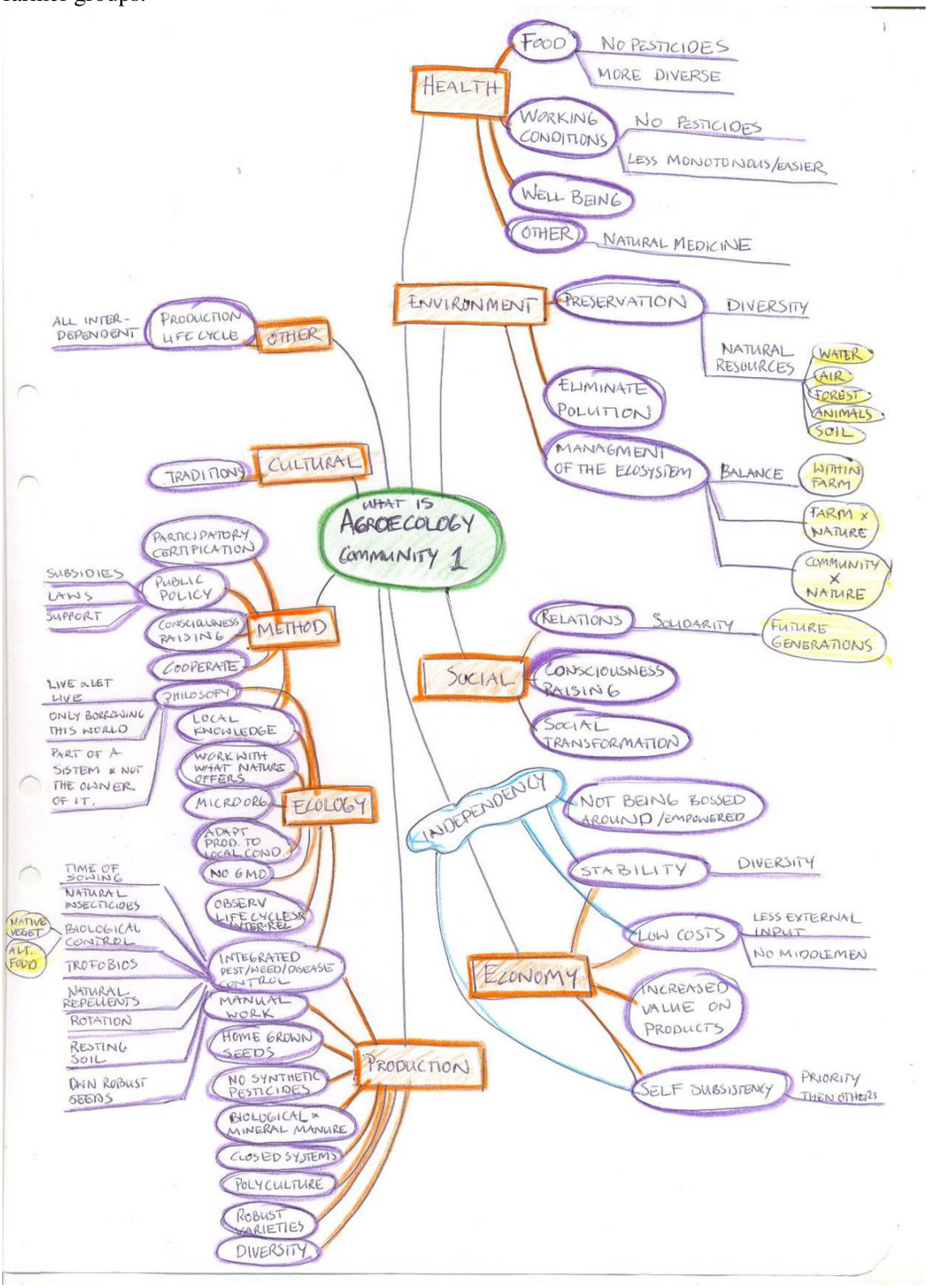
Ethical;
-Ethnical segregation between colonisers, they don't identify themselves as Brazilians which makes them not fight for a "better Brazil".

Demographical/geographical;
-Distance to big town for commercialisation (transportation cost). A geo-social distance between town and country creates unawareness of agricultural reality and consumer preferences.

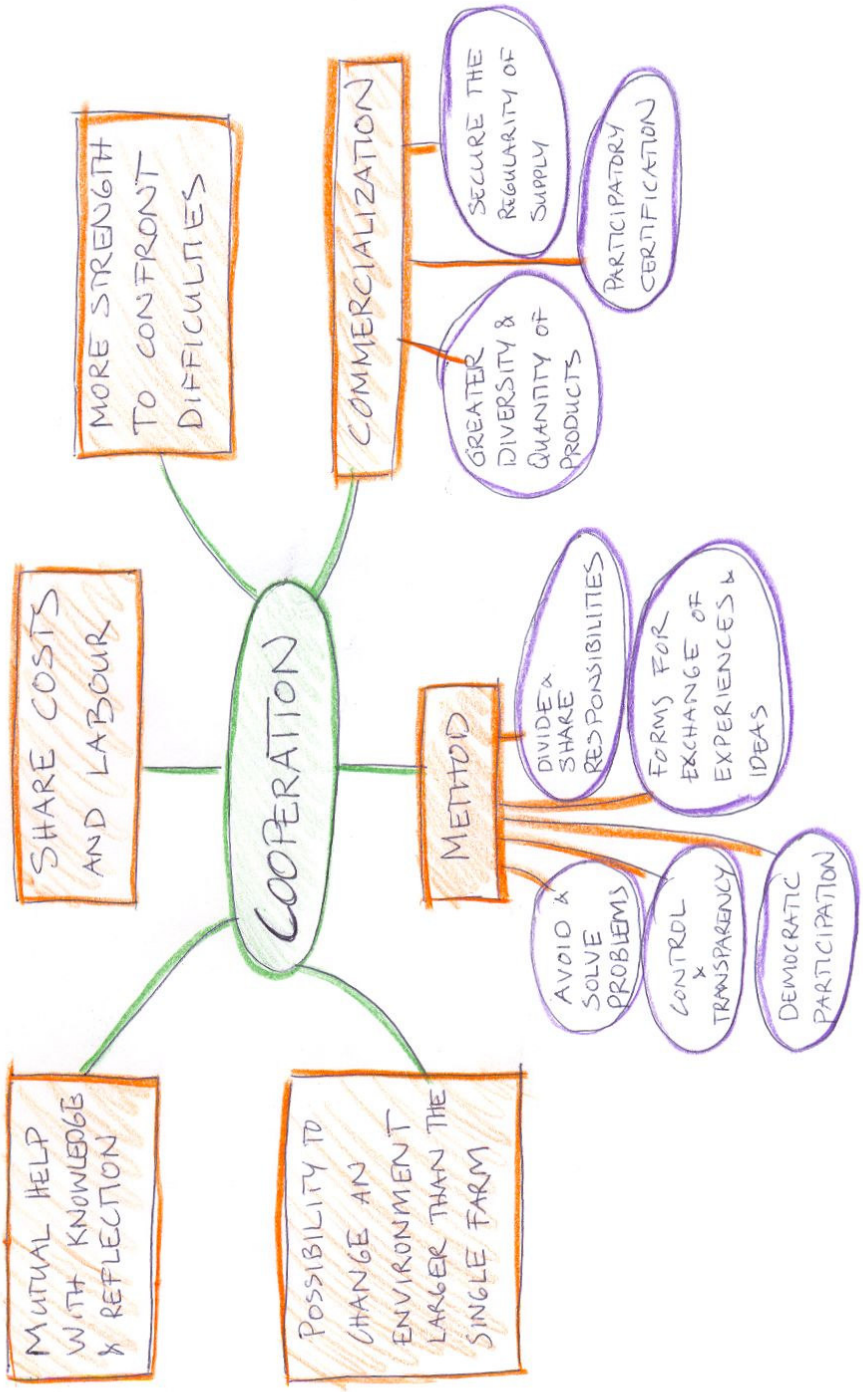
Appendix 3. Rich Picture



Appendix 4. Example of Rich Picture Mind-map – Agroecology according to one of the farmer groups.



Appendix 5. Example of Relevant System or Theme.



Appendix 6. Photos Ibiraiaras

Photo 2. Living mulch for soil recovery.

Photo 3. Creole (traditional var.), robust and high yielding corn.

Photo 4. Drying black beans.

Photo 5. Crushing figs for jam production.

Photo 6. Milking cows.

Photo 7. Intercropping tomato and lettuce.

Photo 8. Preparations for the Farmers Market.

Photo 9. Soil recovery and initial step of agroforestry.

Photo 10. (right) Rain-water harvesting cistern at the school of Padre Aleixo.

Appendix 7. Photos Vaca Morta

Photo 11. Oxes taken to pasture.

Photo 12. Creole var. of corn.

Photo 13. French international cooperation agency AVSF/Cigda visiting Vaca Morta.

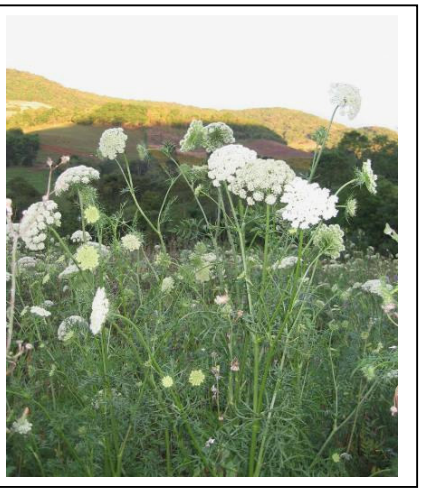


Photo 14. Carrot seed production.

Photo 15. Erva Mate (tee) as hedge crop.

Photo 16. Rice harvest.

Photo 19. Biodiversity and intercropping in the field; corn, pumpkins, manioc (cassava) and beans.

Photo 21. Home-made cheese. See the ecological farmers market T-shirt.

Photo 22. (to the right) Pinão is a chest-nut like fruit of the local Araucaria pine (Monkey puzzle tree).

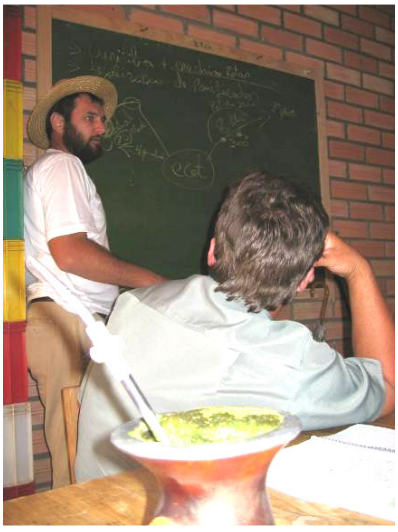


Photo 18. Ecoterra meeting.

Photo 20. Sponge squash (dried fibres used as washing sponge).