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Territoriality of the agroecological and conventional systems in family farming in Rondônia - the Amazon forest – Brazil.

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Abstract - This article focuses on one of the themes developed in the Project leader between Fluminense Federal University - UFF (Rio de Janeiro State) and Federal University of Minas Gerais - UFMG (Minas Gerais State) sponsored by CAPES (Coordination of Improvement of Higher Education Personnel). The research is developed in Earth and Society Nucleus - Study Group on Agrarian Geography, Familiar Agriculture and Peasant Culture and the Laboratory of Agrarian Geography and Agriculture Family, linked to the Graduate Program in Geography and the Department of Geography of UFMG and the Research Center for Agricultural-Environmental of the Graduate Program in Geography of UFF. The main project is related with "*Family agriculture, environmental sustainability and territoriality in the Amazon*". In this paper the proposal is to discuss one part of the global research: "*territoriality of the agroecological and conventional systems in family farming in Rondônia - the Amazon forest*". This study will present a brief discussion about the qualitative contribution of agroecological systems for the family farmers in the state of Rondônia and their effects on regional-local sustainable development. In the conventional agricultural method it will be presented the evidence of degradation of the environment in some figures. The focus of this paper is on a reinterpretation of family farmers that practice an agro-ecologic agriculture and others in this area. Intend to debate where the agroecological families are located in this territory if has or not a territory of agroecology, how they can survive using this type of agriculture and to show the importance of the commercialization (especially in the trade fair) of this production as a source of economic resources for this families.

Keywords— agroecology, Rondônia–amazon Region, familiar agriculture.

I. INTRODUCTION

The state of Rondônia in Brazil has some specialities in rural history. The National Institute of Colonization and Agrarian Reform - (INCRA) held the official implementation of projects of colonization of land. Some of them started in 1970 in a Military Government. After that "From 1970 to 1999, almost 700,000 families were settled through land reform programs in Brazil, using both redistributive and colonization data, with 370,000 settling from 1995 to 1999" (Ludewigs, et al., 2009). Were implanted three kinds of projects: integrated colonization, directed settlement and settlement in various regions of the Rondônia. In the 1970s, small lots were 100 hectare (ha), decreasing to 50 ha in the 1980s (Pacheco, 2009).

The establishment of official colonization projects in Rondônia generated deforestation of Amazon forest, that were replaced by agriculture and pasture indiscriminately. "Massive conversion of forests into cattle ranches was promoted by the government during the 1970s-1980s through colonization initiatives and highly subsidized credit loans" (Hecht, 1985; Escada et al., 2003). Deforestation was in that time the best way to achieve the objective of acquiring the rights of the land, it was the way to show to the government that the area obtained was been utilized. "The lack of infrastructure and support creates an incentive for farmers to shift from annual and perennial agricultural to cattle ranching" (Ludewigs, et al., 2009). Fearnside (1993) suggests that 70% of deforestation is attributable to large-scale ranching operations. Homma et al. (1995) mention that 50% of deforestation in the Amazon is due to smallholder, shifting and cultivators. How can see neither the researchers according with the role of small agricultures and, in the case of this article, the agroecological farmers in this process.

Nevertheless, today the humanity claims for another attitude of these agricultures – do not cut down the forest that remains yet a moment. So SEPLAN (1988) make a plan to Rondônia State and divided its territory in six (6) different “agroecological and economic zones” as shown by Summers et al., (2004). “As an alternative many major environmental non-governmental organizations and development agencies have adopted sustainable extractives activity and agro-forestry in the design and implementation of integrated conservation and development projects. Looking from this perspective forest and soil conservation are necessary for agricultural sustainability in land reform areas in the long term” (Fearnside, 2001). Otherwise from a socioeconomic viewpoint, neoclassical economic theory informs us that competitive farmers and efficient lot sizes are “naturally selected” by market forces (Ludewigs, et al., 2009). Then it has a problem because for the agro-ecologic farmers the production is in small scale and has to achieve a different market for selling this product, mainly AFS (agro-forestry systems, organic coffee, cocoa, coconut, pupunha, cupuaçu, heart of palm, açaí and coconut. This market is based on different logic, not capitalist: promote environmental practices, such as the use of organic matter as fertilizer in place of chemical inputs, to contribute to the increases of life quality and of income generation of the familiar farmers. “Must be ethic and solidary, also includes actions such as the eradication of slave and child labour, elimination of discrimination of race, gender and religion, the preservation of health and the environment, respect for labour rights, historical and cultural identities, local and regional. It works on issues related to managing the production process, the elimination of speculative commercial intermediation, ensuring fair payment for small producers, to encourage the creation of associations and cooperatives and guarantee instruments for obtaining information disseminated to all actors involved” (Binsztok, 2008).

It is called *fair trade and Solidary economy* (Grüninger, et al., 2002; Singer 2002). It can be seen as a partnership between producers and consumers working to overcome the difficulties faced by the former to increase their access to market and promote the process of sustainable development. But *fair trade*

is not well developed in Brazil. Because of no presence of efficient market chains for these products, even in Rondônia, the totally dependence from european market and sometimes the buyers do not follow the rules of fair trade of privileging the small producers. (Binsztok, 2008).

To be an agro-ecologic farmer is needed much physical effort and labor of the family comparing with conventional producers. And the gain of been an ecologic must be the recognition for this effort by the government and the society. The government is leaving aside this responsibility and the ONGs are trying to make this guideline in Rondônia. But it is not so easy to realize this task, to implement chain markets and small units of production for these agroecological farms. Some small depulpers installed have not been used in fullness.

The reality is: the government implements a politic of dividing its territory in six (6) different agroecological and economic zones and the others links needed to supplant this strategy is not defined. If the urgency is to stop the deforestation some authors have been said that the alternative projects with small familiar producers are really important (Becker, 2004; Ferraz et al., 2009, Browder et al., 2004), but they are not the solution if the support does not exist.

In Rondônia the familiar agroecological farmers also produce polyculture that is responsible for supplying supermarkets and markets daily, offering low-cost products for the people coming to form a "green belt" for supply to cities (Binsztok, 2008). For these products they have a market to sustain a cycle of production, but some products are lost because of the weakness of chains of distribution and demobilization.

Then it is coming the point of theoretic discussion. Spatiality the research has shown that the agriculture farmers are located disperse and spacers in the municipal districts. The intention here is to discuss if have or not a *territory* or *micro-territoriality* of the agroecological family farmers and if they have *power* to change their lives. It implies on potentiate projects of development with social justice (Saquet et al., 2009). Furthermore, the desire is not to exhaust the subject, but start a debate about it. It has been seen in the field trip that the farms are located far from one to another and the relationship between the agricultures, that has the same practice, is being done by NGOs or

in some community organization or when they sell their products in daily market. Their space of operation is delimited by the link between the technical support and the projects developed in which area. In Rondônia it has Terra Sem Males and Padre Ezequiel and government agents. Each one has their role in different process with the farmers. There is an eloquent debate in the geographic literature about to be or not to be a territory, and their aggregated concepts, beside region, a territory beside space and so one. For agroecologists farmers in Rondônia this debate is really appropriate. The empirical brings some questions on this thread.

First of all, this discussion is based on Sack (1986), Raffestin (1988), Arendt (1999), Saquet (2009), Haesbaert (2004), Hendrich, (2009). The notion of living a certain situation of occupation and use *can* produce feelings of belonging to this universe and establish ties identity of this territory. It is before of consolidated fact one relation. This relation can be stable or not. Therefore its links, ties also are not fixed and absolutes (Hendrich, 2009). Another important concept linked with this is the unit of area of each farm, the tenure. This part alone is not a territoriality, but in some extent the power relation is the more important to generate the territory. So, it has to be apprehending in domain and in extension, articulating occupation and dimension. It occupies because it seeks to dominate an extension too. Occupation, use and representation are aspects of the relation of power that produces the territory. Thus, can be micro-territorialities sparse and disperse like the agroecologic farmers in Rondônia? And agroecology in Rondônia can be called as a territory of power because of their occupation, (each day less - because of the pasture increasing), and their linkage between occupation and representation? Or doubtless the agroecologic family farmers in Rondônia could not be analysed to the prism of territory theory. If not we bring in this paper this question to be discussed and improved to upcoming articles.

A. Objectives:

The objectives of this paper are: **(i)** to show and analyse the characteristics of farmers interviewed and their territoriality or not (conventional and agro-ecologic), **(ii)** their relationship with the forest and

their liability forestry, **(iii)** where they are and **(iiii)** how is the relation with the market.

II. FIELD WORK AND METHODS

A. Study Area - Amazon Region – Rondônia State

The research and field trip was developed in the state of Rondônia in Brazil as shown in Figure 1.

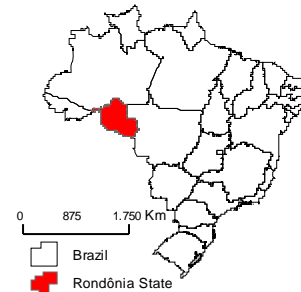


Fig. 1: Rondônia State – Research Area
Organization: Gianasi, L. M (2010)

It was visited thirty six (36) family farmers that may be visualized in Figure 2. These producers are located in eight (8) municipalities located in three Micro-regions, Alvorada do Oeste, Ariquemes and Ji-Paraná in the state of Rondônia - Brazil, which belongs to the Amazon region (*Includes the nine states comprising the Brazilian Legal Amazon (BLA), namely: Pará, Rondônia, Roraima, Amapá, Amazonas, Acre, Maranhão, Tocantins, and Mato Grosso*). They work in generally with agroecological method and conventional one. This method encompasses organic, permaculture and agro-forestry systems (AFS). It is based on agricultural techniques that combine woody arboreal species (fruit-bearing and/or wood producing) with agricultural production. It have the capacity to make degraded areas productive, preserving at the same time natural resources and providing food, wood, firewood and diverse vegetable essences.

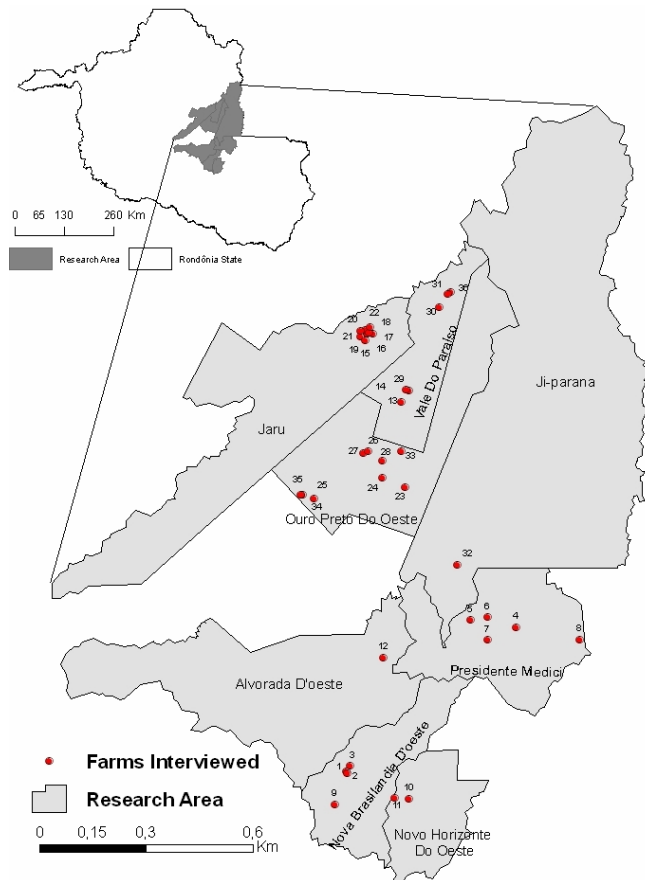


Fig. 2: Research Area – Municipal Districts in Rondônia and farms visited.

Organization: Gianasi, L. M (2010)

B. Data and Methods

The sample of the farmers interviewed was obtained by applying a methodology of oral histories and standardized questionnaires with semi structured inquiry. Where it was researched family composition, social aspects, sociability, land structure, cattle raising, crops and agro-ecology. The survey generated an extensive data base on household composition, economic activity, socio-economic characteristics, agricultural production and land use, forest product extraction, social participation and future plans. The construction of this work is the result of three (3) field trips in central territory of Rondônia (may, july and september), where were observed and distinguished the social actors of family farmers: organic and AFS coffee growing and cocoa, coffee without pesticides,

coffee producers with shading system, producers of horticulture mixed with fruits and corn and beans conventional and organic ones. Here just some of the related questions were analysed. In The field work carried out so far are showing a sparse and disperse dynamic in spatial displacement of agriculture and its pulverization in Rondônia territory. It could be an indication of difficulties to be maintained alive. It was also visited the officials departments-sectors who work with family farmers linked to the agroecological production like the NGOs: the Project Terra sem Males and Padre Ezequiel and government agents as EMATER (Technical Assistance Enterprise and Rural Extension), EMBRAPA (Brazilian Enterprise for Agricultural Research) and ICMBIO (Chico Mendes Institute for Biodiversity Conservation).

C. General characteristics of survey – Family Farmers

The medium size of farm lands area is 33,52 ha, the familiar group is composed by 4 persons in average. The scholar level is 64,0%, 9 years of study; 23,0%, 12 years of study; 11% unlettered and 1% of post graduated and graduated. They immigrated from 7 states of Brazil: São Paulo, Bahia, Espírito Santo, Minas Gerais, Paraná, Maranhão, Mato Grosso, and also Rondônia. The majority are married, just one divorced and one single. 95,6% asserted that is the owner of the lands. In some case it is noticed that is not true. They have just the rights to be there and the property rights are from the government. The majority of them are squatters. The water comes from the catchment basin in 71% of the cases and 29 from the headwater source without treatment. This is a problem for the familiar agriculture, some disease are caused by this lack of water treatment and the absence of sewage treatment. In the crops are used the stream water (almost 100%), that can be polluted by the sewage and chemical products. 98% or sewage is thrown into the pit (*fossa*), 1% in the stream and another 1% in a biological filter. The farmers replies that the major preoccupation is with the water resources (99%), followed by fauna (1%).

D. General characteristics of survey - deforestation

To understand the data about deforestation in the analysed sample of the survey it will be shown the liability of each farm area. There are discussions about the concepts of environmental liabilities and its impact on society (Gallon, 2007), however, in this work it was chosen to adapt this concept and evaluate the passive forest by the difference comes through the area of forest by pasture area. The result percentage of the total property represents the size of the area for the natural environment, ie the local ecosystem. This formula is described below by:

Forestry Liabilities

$$= \left[\frac{\text{Area of Pasture} - \text{Area of Forest}}{\text{Area of Property}} \times 100 \right]$$

Table 1 shows the result obtained in field research. The higher the value of the liability forest the greater the ratio between the area of pasture over the forested area.

ID (1) of Interviewed Farms	Area of Property (ha) (2)	Area of Pasture (ha)	Area of Forest (ha)	Forestry Liability
27	22	0	22	-91
29	15	0	13	-87
24	4	0	3	-80
3	12	0	9	-70
25	5	0	3,5	-70
35	100	20	79	-60
33	15	0	5	-33
2	6	0	1	-19
1	13	0	1	-11
14	50	20	12	16
34	54	24	15	17
23	20	12	7	25
22	32	20	10	31
13	52	24	7	32
31	32	20	7	38
7	10	5	1	40
9	26	15	4	43
12	26	15	4	44
26	25	19	7	48
16	104	70	20	48
11	20	10	0	50
17	25	15	0	60
10	32	22	3	61
18	94	62	3	63
21	21	14	0	67
30	48	37	5	67
20	74	62	5	77
28	90	90	0	100

4	5	NI	NI	NI
5	7	NI	NI	NI
6	20	NI	NI	NI
8	10	NI	NI	NI
15	14	NI	NI	NI
19	5	NI	NI	NI
32	19	0	NI	NI
36	100	NI	10	NI

Table 1: Liability forest of familiar agricultures

Source: Data collected in trip field held in 2009 (May, July and Sept.).

NI – Not informed.

(1)– Identification; (2)– Hectare

	Agro-ecologic Familiar Agricultures
	In transition to Agro-ecologic
	Conventional Familiar Agricultures

Agroecological rural establishments designed large portion of its area for forest areas. About environmental liabilities analyzed, 38.9 percent have negative liabilities. It means they have more forest area than cultivated one. This result refers no presence of pasture. All are agroecological in this parcel and only one is conventional producer. He has large are of forest because he said that is my green savings. When I need I cut some of them to sell. Her family can survive just selling milk with their low percentage of pasture according with his area. The family is composed by 4 people in total.

From other point, the agroecological farmers that appear here cultivates polyculture, extrativism and some of them AFS coffee. They not have milk in your production and always need to buy this product. Their products are selling for the tourists, in daily market and AFS Coffee in a fair trade. But some times they can not sell their production in this market and the price goes down. The profitability is not good for them and the organic product is mixed with non organic losing the labour and the idea of SUSTAINABLE PRODUCTS.

Other group of forestry liability is the positive one. It varies from 16 form 100 percent of liability, covering 52,8 percent of the sample. In here appear those that have more pasture than cultivated area or AFS area. It shows that to have extensive or not cattle ranching besides crops they deforest more than the agroecological farmers. In these sample it has more conventional than agroecologic agriculture, 52,63 and 42,1 percent respectively. One farmer that is changing to agroecological system is in this group with 5,26 percent of the group.

By another analysis, it is really interesting when can associate forestry liability with environmental law for the Amazon region with respect to purchasers of land and the squatters of colonization. The law nowadays said: who deforested their property until the year 2004 should recover 50% of its forest in thirty years (is the case of squatters and familiar producers) and those that acquired their property after 2004, the permission of deforestation is 20%.

How was said before the government wanted in the past deforestation and today no more according to world pressure and changing paradigm. Finally we are in the Amazon Forest called lung of the world. But the small farmers are suffering because of that measure. Some do not have area to do that neither tenure, and the land will be legalized if the recovery happens. This is a real dilemma to the small producers and can be seen in the Table 2 below.

In this case the agroecological farmers of negative forestry liability has the better situation, considering that their lands was bought before of 2004. The positive one has lots of area to recover according with the current law. In both cases the farmers has to adjust existing laws. The feelings observed by the oral histories are that there is a fear of not clearing any more. They fear the environmental agents and the fines over the clearing.

Area of forest (ha)	Areas bought post 2004 can deforest 20% (1)	Areas bought until 2004 must recovery 50% in 30 years (1)
22	17,6	11
13	12	7,5
3	3,2	2
9	9,6	6
3,5	4	2,5
79	80	50
5	12	7,5
1	4,8	3
1	10,4	6,5
12	40	25
15	43,2	27
7	16	10
10	25,6	16
7	41,6	26
7	25,6	16
1	8	5
4	20,8	13
4	20,8	13
7	20	12,5
20	83,2	52
0	16	10
0	20	12,5
3	25,6	16
3	75,2	47
0	16,8	10,5
5	38,4	24
5	59,2	37
0	72	45
NI	4	2,5
NI	5,6	3,5
NI	16	10
NI	8	5

NI	11,2	7
NI	4	2,5
NI	15,2	9,5
10	80	50

Table 2: Area of forest that each farm needed to be in agreement with the law for Amazon region.

Source: Data collected in trip field held in 2009 (May, July and Sept.).
 (1) – Area in hectare that can be deforested according with the farm land extension and the current law.

To illustrate how is structured and distributed the use according to forestry liability it was created a mosaic of different land use surveying in field trip (Figura 3). This type of design shows how is the combination of AFS, extrativism, coffee and cocoa - negative liability and pasture - positive liability. The Google images are just an example and the extension of area and scale are not real. We assumed the data transcript from the questionnaire by the farmers.



Fig. 3: Mosaic of Farm Property Areas and their Forestry Liability.

Source: Google Earth 2010. Trip Fields 2009.
 Organization: Gianasi, L. M (2010)

E. General characteristics of survey – extractivism, annual crop and subsistence products.

Annual crops, coffee and cocoa, are present in 88% of the sampled farms, other 12% are pasture area and without information. Cattle ranching is practiced by 52,7% of the farmers, ranging from 6 to 180 oxen and cows. Perennial agriculture is found in 88% of questionnaires. Small agroecological farmers, to their maintenance, cultivate all subsistence products like: rice, bean, sugar cane, corn, manioc, banana, coconut, fruit and vegetables orchard.

Conventional ones focus mostly on cattle ranching and annual crops and the activity of extract some products from the nature are decreasing like açai, pupunha, cupuaçu, babaçu, and heart of palm in this group. It is done by 50% of interviewed farmers, mostly agroecological as can be seen in the Figura 4 below. This summarization in a representation of the sample is really didactic. Although the farmers became farmers of cattle, it is shown that they, in this sample, continue with the annual crop. For all farmers, it returns for them amount of money in the harvest – that is called “the saving” to do some infrastructure changes in their house, buying some electric and electronic material for their comfort, clothes, etc. This source of income is much important for farmers in general. They work hard all year to receive this money and realize some few dreams.

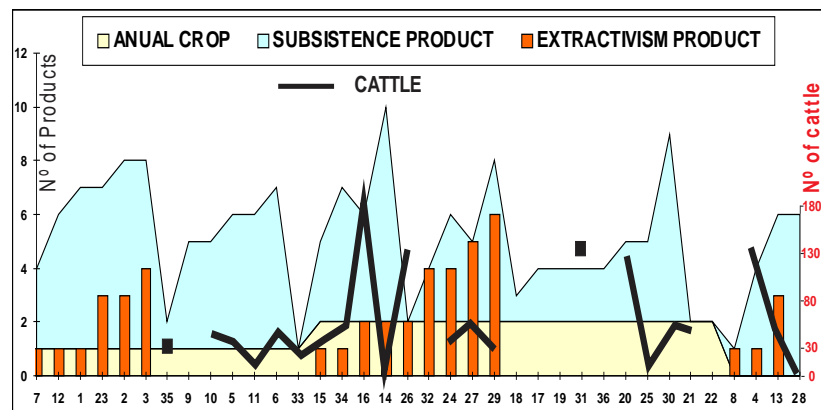


Fig. 4: Production Characterization of each Farm.

Source: Data from trip fields 2009. Organization: Gianasi, L. M (2010)

III. RESULTS

In this research could be identified among the agroecological farmer's families a latent concern for the environment and also an awareness practice for preservation of forest areas. In agroecological family farms this feeling is more latent than in other categories of farmers. The relationship with the nature is for them an experience of healthiness. But a felling of fear is presented in all of them, some because they do not have means and money to adjust the farm with the environmental law. And they do not know how will be the agriculture future for them.

In some case this feeling is related with the theoretical discussion elaborated in the introduction. This fear shows that the territory or micro-territory of family farmers are shattered, without power of changes. It means: the politics are not privileging this category of farmers. They do not have forces to wrestle. They can establish feeling of belonging to the same universe – be a small agroecological farmer or conventional one - but not a power relation to *generate* a territory. They occupy, they use but they do not *represent* in certain way the category of sustainable producers. They need to configure extension, occupation, dimension and power to be seen. So once time you are seen as a symbology of power you will have your rights respected. Because of that I encourage here to defend not a territory but a rejected fragment of real landscape.

Regarding the resultant forestry liability, it is important to highlight that the conventional cattle farmers tend to be more devastating, inclusive changing habits and ways of live in the Amazon Forest, than the small agroecologic, AFS and organic one. The cattle farmers some times do not have neither the vegetables orchard in the farm. They are totally dependent on the market to survive unlike the small agroecological farmers.

For agroecological farmers the dependency is to buy meat and milk when they don't have the in the farm and some industrialized products. And to sell they is in favor of market of annual crops and differentiated agro-ecologic products. If has the fair trade the can earn more money each year, but if do not the thoughts are my work in the agroecological coffee and cocoa job was lost.

This research is showing to us that the family farmers from Rondônia have their own dynamic associated to their past history. Our results reinforce the need for a more complete characterization of family farms where agricultural activities play an important social-economic and environmental role.

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