



THE EMERGENCE OF NEW SOCIOPRODUCTIVE PRACTICES AND INNOVATIVE CAPACITY OF SMALL FARMERS IN AREAS OF AGRARIAN FRONTIER THE CASE OF THE REGION OF MARABÁ, IN THE EASTERN AMAZON

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THE EMERGENCE OF NEW SOCIO-PRODUCTIVE PRACTICES AND INNOVATIVE CAPACITY OF SMALL FARMERS IN AREAS OF AGRARIAN FRONTIER

THE CASE OF THE REGION OF MARABÁ, IN THE EASTERN AMAZON

Myriam Oliveira*, Jalcione Almeida **

* Campus Universitário de Marabá. Folha 17, Quadra 07, Lote especial. Nova Marabá. CEP : 68505-080.

Núcleo de Ciências Agrárias e Desenvolvimento Rural (NCADR), Universidade Federal do Pará (UFPA)
Marabá, Pará, Brasil
myriam@ufpa.br

** Av. João Pessoa, 31. CEP : 90040-000.

Programa de Pós-Graduação em Desenvolvimento Rural (PGDR), Universidade Federal do Rio Grande do Sul (UFRGS)
Porto Alegre, Rio Grande do Sul, Brasil
jal@ufrgs.br

Résumé — Les transformations qui se sont produites à la frontière agraire de Marabá au cours des 15 dernières années, beaucoup d'entre elles liées à la mise en œuvre des politiques publiques, ont entraîné des changements dans les systèmes de production pratiqués par les agriculteurs au sens d'essayer des solutions socioproductives pour assurer, surtout, leurs reproductions sociales. Le thème qu'on prétend traiter est comment les capacités d'adaptation et d'innovation des agriculteurs ont contribué à l'émergence de nouvelles formes d'exploitation de l'environnement offrant davantage de possibilités de rester sur place où ils vivent aujourd'hui. En outre, il y a également l'intérêt d'aborder l'influence que les politiques publiques jouent dans ce processus d'adaptation. Dans ce sens, le présent document vise présenter et discuter les principales pratiques socioproductives actuellement entreprises par les agriculteurs familiaux dans la région de Marabá. L'originalité et la contribution de ce thème sont à identifier et analyser ces nouvelles formes d'exploitation des moyens adoptés par les agriculteurs et leurs impacts sur l'environnement et l'analyser la mesure dans laquelle les politiques publiques contribuent efficacement (ou non) à promouvoir un développement plus durable. D'après ce qu'on a pu observer, en général, ce processus d'adaptation dans la région a connu l'émergence ou l'introduction de certaines innovations dans les systèmes de production. Ces innovations, malgré le fait que quelques une



produisent des effets négatifs sur l'environnement, ont joué un rôle majeur dans les exploitations familiales en leur offrant, au moins pour l'instant, plus de chances de rester en place.

Mots clés: Amazonie ; Fronts pionniers ; Agriculteurs familiaux ; Durabilité ; Capacité d'adaptation.

Abstract — The emergence of new socio-productive practices and innovative capacity of small farmers in areas of agrarian frontier : the case of the region of Marabá, in the eastern Amazon. The agrarian frontier of Marabá, in the eastern Amazon, has historically been marked by a pattern of exploitation and highly aggressive predator of the environment, a pattern linked to processes of occupation and it developed a fierce dispute between the different local actors for the possession and use of natural resources. Among the characteristics of this region, the processes of cattle raising and land concentration have been remarkable because of significant importance to take the regional dynamics and to be responsible, in large part by the expansion of the land and the steady influx of new forest areas. Although the pattern of exploitation based on the replacement of forest by pasture is still important, today is not more prevalent. The transformations that are occurring in this region over the past 15 years - many of them related to the implementation of public policies such as land reform, agricultural support and family environment, where there has been a significant emphasis in the discourse of sustainable development, and some related to the limitations imposed by the very progress of the exploitation of the natural - have led to changes in production systems practiced by farmers to experiment with alternative social and productive as to maintain its consumption and its social reproduction. The main theme intended to be treated, then, is how the innovative capacity and adaptability of farmers has contributed to the emergence of new forms of exploitation of the natural environment offering greater opportunities to remain in the land, thereby contributing to reduce the search for new areas of forest to plantations. In addition, if you want to focus on the effects that public policies have produced both as regards the introduction of new elements to stimulate the establishment of more sustainable production systems, based on diversification and integration of productive activities, and participation that has had, even if not directly, even to the adoption of practices harmful to the environment. The aim of this paper is to present and discuss the key social and productive practices currently developed by the farmers of the agrarian frontier of Marabá within this regional context of heightened concern about environmental problems and sustainability of production systems practiced. As these recent changes, originality and contribution of this article are in fact not only to identify and analyze these new practices adopted by farmers and their impacts on the environment, but the analysis is the extent to which public policies effectively contribute in the process to promote a more sustainable development, bringing some of their strengths and weaknesses to the discussion. Because this region has been a particular target for implementation of various policies of the federal government, such issues are of great importance to the debate currently in vogue in the region, mainly because they can bring relevant information to consider in the process of readjustment of certain policies, including and the credit environment, and discussion about the role of teams of technical assistance as a major player in the process of encouraging the establishment of more sustainable production systems. The data used as the basis of the article were obtained from field research carried out on 22 family farms located in four rural settlements in the region of Marabá, in the southeastern state of Pará, two of them located in the former occupied area and two in area more recently occupied. The survey was made of information from interviews with semi-structured interviews with the key actors, interviews with semi-structured interviews and questionnaires with the families of farmers and from direct observation in the field. As far as one can see there is internal diversity in this region in terms of ecological and socioeconomic conditions that determine the strategies that farmers will adopt and, depending on the degree of restraint, impose such conditions, the influence of these farmers search for alternatives and productive to ensure the social functioning of their production systems. Depending on precisely this internal diversity exists, the new regional context has produced different effects and, to some extent, paradoxical. First, the current conditions that farmers have available and the learning derived from their own experiences of failure with regard to the sustainability of production systems, have led to the development of new forms of exploitation of the environment. The interesting thing is that even with a relatively greater awareness about environmental problems, compared to the past, especially considering the influence of environmental policy from the implementation of new mechanisms of restraint and greater monitoring by environmental agencies, the process of adaptation of production systems may include practices that are not necessarily less impacting the environment or represent a more lasting sustainability in the medium to long term. As in the past, concerns about preserving the environment or mitigation of impacts are still secondary to the main issue for farmers is to ensure their social reproduction. This means that to ensure that household consumption is necessary to use pesticides, for example, the farmer will use this type of subterfuge, even with some awareness



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of the damage by contamination that can bring him and the environment. On the other hand, especially with the policies of reform (and greater security of tenure), credit and technical assistance, insisting on the concepts of sustainability and diversification, farmers are increasingly looking to experience the diversity of their systems productive. In both cases the main purpose that guides the family is to seek opportunities that helps to ensure their social reproduction in the same land that operates today.

Key words: Amazon, Borders Agricultural, Family Farmers, Sustainability, Adaptability.

INTRODUCTION

The agrarian frontier of Marabá, in the oriental side of the Amazon, like other frontiers, has been marked by a very strong and accelerated pressure rhythm over the landscape natural and transformational elements, and by an aggressive e depredative pattern of exploration. Such rhythm, among other causes, was historically determined by the occupation processes that took place in the region, which main characteristic was the intense dispute between different actors, with different social and economical interests, not only for the possession of the land, but also for the possession and usage of other natural resources, such as wood and minerals (BECKER, 2001; CASTRO, 2005).

Since its occupation was intensified, around the middle of the 1970's, it took place in the region a dynamic of land use, translated by the adoption of a pattern, for a long time considered hegemonic, based on the deforestation and in the implementation of pastures for the creation of cattle. The generalized use of this form of exploration, in the sense that it was adopted by agriculture families, as well as by large land proprietors (regionally called *fazendeiros*), and most of the time was justified by the land instability as well as by as well as by the poor infrastructure conditions and the socioeconomic context. Besides that, such dynamic was also justified by the forms of state action that aimed to motivate the large capital, reasoned over a modern conception of progress that advocated the necessity to transform the Amazon, an "isolated, empty, not productive and underdeveloped" place (represented by the strong presence of forest areas) in a productive place, inserted in modernity and in the development process of the country (image represented by the modified landscape, with pastures or "land improvements").

To this model of exploration of the natural environment, it were normally associated consequences such as the homogenization of the pastures and of the regional ecosystems (CASTRO, 1999), high rates of deforestation and the establishment of cattle raising processes and of land concentration, considered relatively typical in areas such as the agrarian frontier (COY, 1988 ; 1996 ; LÉNA ; OLIVEIRA, 1991). In the region, during at least two decades, these processes were decisive for the expansion of the frontier and for the configuration of the social dynamic.

Currently, despite the fact that the substitution of the forest areas for pastures still is one of the main forms of exploration of the natural environment, other ways of use f the soil are gaining space in the region. During the last 15 years, the heavy implementation of federal public policies, mainly aiming to support the family agriculture and the treatment of the agrarian and the environmental issue, produced effects that have operated, in a larger or smaller proportion, over the regional dynamic. Among the most significant reflexes of these policies in the region are the changes occurred in their political and socioeconomic contexts, expressed, for example, in the consolidation of family agriculture as a determinant social category in the region's development process, in the diversification of its representative structures, in the relative improvements in the regional infrastructure (roads, service offers, electric energy, commercialization offers) and in the intensification of the possibility of land security (through expropriations and land regularizations).

As well as they have contributed to broader changes in the regional cenario, the public policies have also been important in triggering changes in the level of farm families. The improvement in the investment capacity of farmers, the greater access access to technical assistance, the restraints imposed by environmental agencies and the great emphasis currently given to the speech of diversification and sustainable development, all tied to the credit policies, technical assistance or environment protection as factors that, together with the relatively favorable socioeconomic conditions have influenced in the alteration of the productive systems of the farmers (OLIVEIRA et al., 2005).

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But, despite the significant influence of policies on the configuration of the current regional dynamics, it is worth mentioning that these are not the only cause of the changes occurring in the family production systems of Marabá. The presence today of a framework for limiting ecological conditions of the natural environment, which formed as a result of the very process of exploration adopted over time in certain areas of the region, especially those where there are the older areas of occupation, has also constituted a determining factor for making such changes (OLIVEIRA, 2009).

The changes developed in the family sites show a process of reaction and adaptation of the farmers to the new conditions posed by socio-economic and natural resources, conditions that encourage or even require them to try new alternatives in order to produce, to change their productive and social practices to ensure their livelihood. This re-adjustment is much more relevant because of the fact that the families of farmers in the region today, seem more interested in adopting a strategy of social reproduction that is staying on the land and establishing a strong bond with the place - making the place where they live their life their place of life - than the spatial change through migration, very frequent in this region in the recent past.

It is intended to treat the subject of the innovative capacity and adaptability to conditions that farmers have available and that have led to develop new forms of production and exploitation of the natural environment to give them a more likely chance to stay on land and at place. This phenomenon has been observed in earlier frontiers such as Brangantina, in northeastern State of Pará. It was named by Carvalho (1998) as the process of "changes to remain", and its existence in the Marabá region gives indications that this area is now in a dynamic of consolidation of space.

Moreover, due to the weight that had and still has in the triggering of the changes in family farms, it is also of interest to address to the influence that public policies play in this adaptation process, helping to introduce new elements in production systems that have contributed to the diversification and integration of productive activities, as well as for the adoption of practices harmful to the environment.

The objective of this paper is therefore to present and discuss the main socio-productive practices currently undertaken by family farmers in the region of Marabá in this new regional context with different structural characteristics and a dynamic where to stay on the land emerges as a key guiding forms of exploitation of the natural environment.

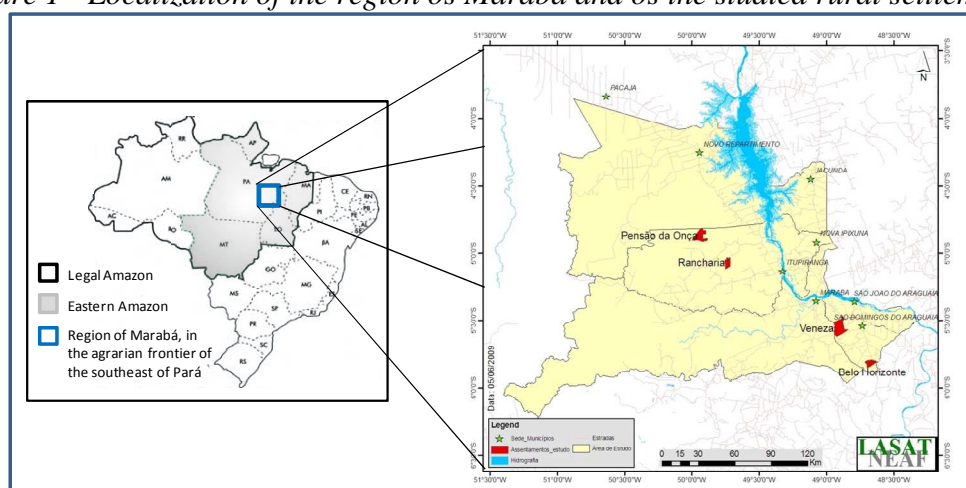
Since they are relatively recent change, the originality and contribution to this theme are not only in identifying and analyzing these new forms of exploitation of the means adopted by farmers and their impacts on the environment, but it is in the analysis on the extent to which public policies contribute effectively (or not) in the process of promoting a more sustainable development. How Marabá has been a particular target for implementation of various policies of the federal government, this analysis is relevant in that it can feed the debate on sustainable development and environmental problems current in the region.

The empirical data that underpinned the article were obtained from field research carried out on 22 family farms located in four rural settlements in the region of Marabá, in the southeastern state of Pará, two of them in the oldest area of occupancy (typically with over 20 years of occupation) and two in the area of most recent occupation (on average less than 10 years of occupation) (Picture 01). The survey data was conducted through interviews using semi-structured scripts with key interlocutors, interviews using semi-structured scripts and questionnaires with the families of farmers and from direct observation in the field.

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Picture 1 - Localization of the region os Marabá and os the studied rural settlements.



Source: Data bank of the Laboratório Sócio-Agrônomo do Tocantins – LASAT / Núcleo de Ciências Agrárias e Desenvolvimento Rural – NCADR / Universidade Federal do Pará – UFPA (2008).

1. THE CHANGES IN THE SOCIAL-PRODUCTIVE PRACTICES OF FAMILY FARMERS OF THE REGION OF MARABÁ

As mentioned, in recent years, the changes in the regional context has triggered a major process of change in the strategies developed by farmers, changes that have involved alterations in practices socio-productive and, consequently, in the forms of exploitation of the natural environment and that have as background the finding of ways to ensure the process of social reproduction of the family in the same place where they live today.

According to study conducted by Oliveira (2009), in general, these changes in the practices of farmers are mostly related to the management strategies of space and natural elements and can be said to occur on two levels: one that pertains changes in the “ways of doing” the exploration of the farm, and another that refers to the variation of the productive activities that are developed on it.

In the “way of doing”, the ongoing changes have been more related to production limitations that farmers are facing, mainly imposed by ecological conditions available. This has been observed mainly in areas of the region occupied for a larger period of time, by the very exploration process based on the nearly complete replacement of forest areas for pastures and the lack of proper management of soils and pastures, there are practical difficulties of lack places considered appropriate by the farmers, whether to implement growing areas to ensure the household's consumption, for the development of livestock, or for the development of cattle raising, an activity that assumes significant importance on family farms in the region.

The changes have been processed at that level have been of two orders. The first corresponds to the new forms of organization of space taken by farmers to enable the implementation of growing areas and cattle raising, there being included: the reuse of pastures infested by weeds to form fields (due to lack of forest areas for the use of the cut-burn system), adopting a scheme of using space based on successive shifts and choice of farmers for places where the conditions appear more favorable in terms of soil fertility, topography and water availability; intensification of the use of space from the fixation of unique areas as growing areas, regardless of what the antecedent (if it is forest land, *capoeira* or cattle raising area) and the recovery of pastures abandoned due to heavy infestation by weeds.

These new ways of organizing the use of space have, in turn, imposed on farmers the need to promote changes of another order, directly linked to the production process itself, which

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relate to both the practical and technological standard employed. In terms of the practices, it has been observed, for example, a reduction in the number of steps needed to prepare the area of the raising, especially in cases where there is no forest and *capoeira*, when this preparation eliminates the steps of *broca*¹ and fall provoking and is limited to mowing and use of fire for clearing of land ; changes in management practices of pasture in initiatives to adopt a rotational or at least alternated system and more control with the stocking rate of animals at the height of grass to ensure the process of regeneration of pasture; right sizing of the herd size and/or lease of other pastures to avoid high grazing pressure (*sobrepastejo*) ; decrease in the use and increase in the care in the practice of fire, both associated with not only the creation of new collective social rules, internal to rural locations, necessary due to the increased risk of accidental fires caused by the reduction of natural barriers of protection from wind and fire spread, but also to the increased monitoring by environmental agencies.

Regarding to changes in technological standards, the alternatives that farmers have been searching to continue producing have resulted, in many cases, in the adoption of new technologies and incorporation of outside elements into the production system. One example of this has been the investment of farmers to introduce mechanization into their establishments, aiming to make the work of clearing and tilling the soil to prepare the garden areas easier, especially those with history of pasture, and for the rehabilitation of pasture for livestock. Moreover, the introduction of elements external to the system has also been occurring through the use of chemical inputs such as fertilizers, improved seeds and mainly herbicides used to clean pasture and growing areas implemented on pastures. Subject to the limitations of the biophysical environment and the high need for application of hand labor for weed control, this investment in mechanization and/or input is seen by many farmers as the only viable way to achieve the growing and cattle raising activities through the recovery of pastures.

Besides these changes in “way to do” the exploration of the farm, another level of changes occurring in the region in management strategies of space and of the natural elements are related to the activities developed in the production system, with emphasis on the diversification initiatives that several farmers have sought to implement in their establishments. In most cases, this diversification has occurred through the introduction of new activities in the production system, the valorization of the activities already developed, but that did not they take on so much weight in the training of agricultural income before, or from changes in the type of production to be valued within the same activity already developed.

In this sense, some examples of these variations in productive activities in the area can be cited, such as: the relative increase in investment in milk production, encouraged by better access and transport structures and the presence of processing structures for the cattle raising products existing in certain areas of the region; increased investment and recovery of small farms, such as swine and poultry, or of cultures that have traditionally been developed, such as banana; the introduction of new types of creations, like fish, goats, and/or sheep, or new types of cultures, especially perennial fruit species such as cupuaçu, passion fruit, cacao, urucum etc., stimulated by improvements in the conditioned of access and implementation of some marketing and processing structures in the region; management initiatives of the handling of native species, such as *açaí*, using the current motion of valorization of forest products.

¹ *Broca*, in this region corresponds to the first cleansing in the future growing area before the overthrow is made. Consists of the removal of trees of smaller diameter using sickles and/or machete (OLIVEIRA, 2009).

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Even with the availability of farmers to bring forth the experiences of diversification, in several cases they have not or are not working. The lack of technical knowledge to conduct some of these activities and, according to farmers, the lack or deficiency in the performance of technical assistance are factors that have influenced these negative results. To overcome these limitations, it was realized that to continue this process of diversification of their production systems, some farmers started resorting to alternatives ranging from advice for support of neighbors who have successful experiences, straitening relations of friendship or work with them, the insertion in processes of technical skills promoted by technical assistance or other local institutions/organizations, to the conduction of their experimental actions according to a trial and error logic.

In general, the various changes in socio-productive practices mentioned illustrate the main changes in the strategies of farmers that are happening in the Marabá region in recent times. Despite being a process that has covered the region in a broad manner, it is important to clarify that this assumes the same configuration and the same features everywhere. There is an internal diversity in terms of the ecological and socioeconomic conditions available - illustrated by two spaces, one that involves the earliest occupation of areas with easier access to markets and services, however, with significant restrictions of the biophysical environment, and another involving the newer areas of occupation, whose limitations are focused more on the socioeconomic conditions of the environment - which provides a similar variety in the types of strategies and, as a consequence, practices to be adopted by farmers. This means that, depending on the location and conditions, farmers seek to develop different ways to deal with the limitations and opportunities that they have available, and to ensure the operation of their manufacturing systems.

2. THE PROCESS OF ADAPTATION AND INNOVATIVE CAPACITY OF FARMERS AS A STRATEGY OF PERMANENCE IN THE PLACE

In general, these changes in the level of family farms that are developing in the Marabá region show that farmers take an active role in shaping their own existence. This means that they have a great capacity to deal with the challenges that they face, enabling them to create and/or try to experiment with the answers to take charge and face the difficulties or to use the opportunities to the social reproduction of their family. This ability is reinforced by Costa (1997), quoted by Hurtienne (2005), when he mentions that to ensure the social reproduction there is not necessarily a passive adaptation of families to the structural conditions available, but there may be mobilization of extra efforts to incremental or even radical changes of the production systems to overcome the crisis of reproduction.

This ability of farmers to develop answers to create and recreate the ecological conditions of exploitation, or the social conditions to ensure the social reproduction of the family, is the same power that every living system has to find ways to keep (MORIN, 2002). Such changes in the «way to do» and in the activities that families are pursuing demonstrate how, as social systems, they are looking to assimilate the disturbances through which they have been going, of how they are reconstructing and adapting to current conditions available to its existence and its operation. According to Godelier (1984), this notion of adaptation can relate to the strategies adopted by humans to explore the natural world and face the restrictions imposed against the reproduction of elements of the environment and of their own reproduction. According to him, to adapt is often to submit to these restrictions, to take them into consideration and amplify the positive effects or mitigate the negatives.

As you can see, behind this adaptability of farmers is their great innovative capacity for thinking, for trying and finding solutions of different natures to overcome the adversities they face in the space where they live. It is this ability that can explain how innovative farmers of this region of agrarian frontier are in managing to keep their agricultural production units running and, most importantly, to supply the basic needs of their families, either in a situation

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where conditions are of the natural system are unfavorable, or in a situation where the socioeconomic conditions offers limitations.

Among the small farmers in the region of Marabá such capacity has been expressed, for example, by the advances seen in production systems, as the result of readequation of old ways of doing, or new practices, technologies or new activities. When considering this process of readjustment of practices already known and used, the sense of innovation ends up not assuming the character of something totally new, but similar to that used by Rogers (1995), quoted by Schmitz (2001), which considers that innovation is an idea, practice or object that is perceived as new, no matter whether it is objectively new or not, but it is the perception of the individual or unit of adoption that determines their reaction to it.

From what we can see, these innovations in the Marabá region are linked to different processes. They may have emerged from an endogenous process, individual or collective, initiated from the accumulation of experience, knowledge and information and changing needs, attitudes, skills, future expectations, perceptions and/or knowledge (SCHMITZ, 2001), aiming to place individual or collective farmers in position where they face the existing conditions to search to reduce the vulnerabilities or reduce risks, such as occurred in the establishment of new rules of collective use of fire or of new forms of land management. Or they may, as in most of the innovations identified in the region, have been introduced or adapted from external agents, as in the cases of some diversification initiatives, recovery of native species, pasture management practices, the care with the use of fire, use of external inputs and mechanization, alternatives induced by the credit policy, technical assistance, public institutions or NGOs or by the restraints of policies and environmental agencies.

Whether it is the result of external interference or not, the incorporation of these innovations in the establishments have often been implicated in changes in behavior of farmers, mainly because they lead to disruptions of certain bases already established (Albrecht et al., 1987, quoted by SCHMITZ, 2001). It is what is observed, for example, with innovations that involve increased workload or resources, such as the use of pasture for the establishment of plantations or that requires an increase in the amount of work applied for control of the "mato" when made manually or when it requires greater use of financial resources when made from herbicides; or which involves increased risks, such as the introduction of perennial cultures that involve the reorganization of the allocation of manpower, technical know-how, availability of water, transport, marketing etc.

In that observation of changes in production systems it can be easily seen that, in several cases, the possibility to introduce or adapt innovations to the system and, in some measure, to the production of innovations by the farmers or rural communities have been directly or indirectly, attached to the implementation of public policies in the region. One can not deny that initiatives such as the diversification of productive activities or care with fire, for example, have close linkage with the policies of credit, technical assistance, environmental protection and even land reform, since they all contain among their goals, in one form or another, aspects that of the issue of sustainability that influence the determination of credit, in the acting and in the discourses of technicians, in the implementation of the infrastructure. Moreover, it is also possible to link the incorporation of these innovations to the possibilities opened up by increased investment capacity of farmers, made possible by the access to credit, or the higher sensitivity of farmers in relation to environmental problems that, in part, is the result of these past negative experiences of the farmers, but has also been influenced by the more effective enforcement action from environmental agencies.

Despite the fact that these policies that are related to the production process have a significant influence on the adaptability of farming families, access to policies of other natures, such as rural welfare and social policies of government, have also been crucial. There are many cases where the observed retirements, pensions, family financial assistance have constituted the main support for the introduction of outside elements such as inputs and mechanization in production systems or security source for the development of initiatives that

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include increased risks, such as diversification. These are resources, are originated from these, have ensured, therefore, the introduction of new technologies or new activities on family farms; without them, possibly, several farmers who currently use these innovations would not have effective financial conditions to do so.

And why all this effort to seek innovations in production systems and to adapt to current conditions, which in some cases are even negative in a region where historically resort to migration was the most common strategy to ensure the social reproduction of family? The answer to this question is associated with a process of change that also seems to be occurring at another level of family farms: the life plans of families.

Currently, there are several farmers who are demonstrating more intent to stay with his family in the same place. This is not evidenced only through speeches, but also in the changes in ways of managing the space, with initiatives of perennial cultures, for example, showing some interest in betting in activities expecting a medium/long term return. Therefore, these efforts to innovate in their ways of producing, modifying practices and/or trying new activities, have a close relationship with these changes in the projects. Similar process to that of stabilizing or of remaining in place, currently taking place in the Marabá region, or, as outlined Carvalho (1998), "change to remain", has been observed in northeastern of Pará in the 1980s and 1990s, where changes in production systems, mainly, the introduction of perennial cultures occurred.

This tendency to stay can also be found in major investment has been made in improving the quality of life. Of the farmers interviewed, about half already invested in improving housing conditions and comfort of the family through the acquisition of consumer goods (household appliances, vehicles, furniture), with some lots which are closer to urban centers to managed to install cellular antenna at his residence.

Another element that can still be added to help answer the question is that the characteristics of the current context provide concrete conditions that are relatively more favorable, especially in terms of socioeconomic and political environment, with greater access to services, public policies, infrastructures. Even in cases where the conditions of the biophysical environment present strong ecological constraints, these positive aspects end up helping to encourage farmers to remain in the place instead of choosing to migrate. Moreover, one must also consider the advanced age of farmers who used to resort to migration, the employment opportunities of their sons and daughters in the city and the increasing distances from forested areas (target of several families who chose to migrate after having transformed their land in pasture).

The desire to remain, therefore, is apparently behind these movements for change and has directed the process of innovation and adaptation of farmers. Despite the fact that the efforts to incorporate innovations in the farms are, for now, helping in that order, in environmental and sustainability terms it is necessary to consider the effects that such changes and this process of adaptation have produced are paradoxical. If, on one hand, greater security of land, the insistence by different local actors (government, institutions, technical assistance, NGOs) in the discourse of sustainability and environmental problems and the experiences of farmers have influenced the proliferation of diversification experiences and the adoption of practices that have less impact aiming towards risk reduction, on the other, they have also led to the use of technologies that are not necessarily ecologically and economically sustainable, as pesticides and mechanization. In this case, it is a fragile strategy to ensure continuity, as their medium to long-term use tends to cause new environmental problems.

FINAL CONSIDERATIONS

The purpose of this paper was to show the ability of adaptation of the farmers in the Marabá region to the currently available conditions and to innovate in finding solutions to ensure the

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social reproduction of the family. From what we observed, in general, this adaptation process has gone from the emergency or introduction of certain innovations in production systems and has contributed to the emergence of new forms of exploitation of the natural environment. Even though some are environmentally questionable for the negative effects they produce, the role that these innovations have taken in family farms is of great importance because they are offering, at least for now, more likely possibilities of staying in place. That is to say, in short, that currently, in the Marabá region, the innovative capacity of farmers is focused on ensuring the social reproduction from the residence.

Even though empirically this innovative capacity and adaptability of farmers in agricultural frontier areas has been observed for longer, a more systematic treatment, as a research subject, is relatively recent in Marabá. Earlier studies on this topic were more focused on migration than on adaptation strategies to ensure social reproduction and the innovations in production systems by external agents. However, the discussion that is now settling in the region on the “dynamics of remain” or the “relative stabilization” (COSTA, 1997, quoted by HURTIENNE, 2005) has brought out more forcefully the discussion on the role of innovations in this process of adaptation. Discussions on sustainability and environmental issues, together with the discussion on the need for enhancement of local knowledge aiming the endogenous development, give further impetus to the formulation of questions about these innovations and their effects on the economies of small farmers and on the environment.

In this exercise to observing the mechanisms used by farmers to adapt to the conditions of socioeconomic and natural resources, it is interesting to note the importance of the innovations that emerge from endogenous processes can have on regional development: not only by offering most appropriate responses in the field of production and by having a potential to be valued in the rural environment - as in cases of diverse systems initiatives implemented by the farmers themselves - but also in the field of social relations - as in cases of new rules or forms of organization created within the rural communities. Therefore, they deserve a more careful treatment and greater investment in research and action-research.

Likewise, since the introduction of new technologies and changes in some management practices and management of space is quite recent in the region, there is still a lack of studies that could provide the bases for discussion about the negative and positive effects that, especially in environmental terms, these changes are generating.

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