Vol. 148, No. 2-3 · Research article

DIE ERDE
Journal of the Geographical Society of Berlin

Sustainability of the remaining agricultural Commons in the Brazilian Northeast: challenges beyond management

Luiz Antonio Ferraro Júnior[1], Marcel Bursztyn[2], José Augusto Drummond[3]

[1]*Universidade Estadual de Feira de Santana and Secretariat of the Environment of the State of Bahia, AvenidaTransnordestina, s/n. Bairro Novo Horizonte, CEP 44036-900, Feira de Santana, BA/Brazil, ferraroluiz@yahoo.com.br*

[2]*Center for Sustainable Development, Universidade de Brasília, Brazil Campus Universitário Darcy Ribeiro, Gleba A. Asa Norte, Brasília-/DF, CEP 70.904-970, Brazil, marcel@gmail.com*

[3]*Center for Sustainable Development, Universidade de Brasília, Brazil, Campus Universitário Darcy Ribeiro, Gleba A. Asa Norte, Brasília-/DF, CEP 70.904-970, Brazil, jaldrummond@uol.com.br (corresponding author)*

Manuscript submitted: 15 April 2016 / Accepted for publication: 27 April 2017 / Published online: 27 September 2017

Abstract

This article examines fundos de pasto (FPs) – a land use system that combines individual and collective appropriation of resources, evaluating its prospects in a rapidly modernizing economy. FPs are ancient and commonly held agricultural and animal husbandry lands located in the Brazilian Northeast Region. Aggressive land grabbing practices in the 1970s and 1980s and resistance of FP communities led to the formal acknowledgment of FPs. Data were obtained via individual interviews, workshops with stakeholders, archival materials from government agencies, and secondary studies. Our findings reinforce the perception of sustainability and higher resistance of these communities in years of severe droughts. Despite their secular sustainability, FPs have been under pressure that may lead to overgrazing, such as reduced grazing areas (on account of land grabbing), population growth, larger herds credit operations that stimulate the substitution of native grazing vegetation, and increasingly serious droughts. Our findings also indicate the existence of tensions between economic development and the sustainability of common resource use systems associated with the conservation of extensive areas. Understanding these tensions requires attention to the dimension of farmers' political organization, a perspective that goes beyond the measurement of social capital.

Zusammenfassung

Der Beitrag widmet sich der Untersuchung der *fundos de pasto* (FPs), einem Landnutzungssystem, in dem individuelle und gemeinschaftliche Nutzungen von Ressourcen kombiniert werden. Dieses soll im Hinblick auf seine Zukunftsaussichten in einer sich rapide modernisierenden Wirtschaft betrachtet werden. FPs sind alte, gemeinschaftlich verwaltete landwirtschaftliche bzw. viehwirtschaftliche Nutzflächen im Nordosten Brasiliens. Aggressive Praktiken des *Land Grabbing* in den 1970ern und 1980er Jahren sowie der Widerstand der FP-Gemeinschaften führten zur formellen Anerkennung der *fundos de pasto*. Zur Datengewinnung wurden individuelle Interviews, Workshops mit beteiligten Akteuren, Archivmaterial von Regierungsbehörden sowie Sekundärliteratur verwendet. Unsere Ergebnisse bestätigen die Annahme der Nachhaltigkeit und höheren Resistenz in Jahren starker Dürre. Trotz ihrer säkularen Nachhaltigkeit stehen die FPs unter großem Druck, der

Luiz Antonio Ferraro Júnior, Marcel Bursztyn, José Augusto Drummond 2017: Sustainability of the remaining agricultural Commons in the Brazilian Northeast: challenges beyond management. – DIE ERDE **148** (2-3): 150-166

DOI: 10.12854/erde-148-45

zu Überweidung führen kann, zum Beispiel in Form reduzierter Ausdehnung von Weidegründen in Folge von Landraub, Bevölkerungswachstum, größerer Herden, Kreditvergabepraktiken, die als Anreiz für die Umwandlung natürlicher Weidevegetationsflächen wirken, sowie durch zunehmend schwere Dürren. Unsere Ergebnisse weisen zudem auf Spannungen zwischen der wirtschaftlichen Entwicklung und der Nachhaltigkeit von gemeinschaftlichen Nutzungssystemen hin, die meist mit der Erhaltung großer Landflächen einhergehen. Um diese Spannungen zu verstehen, muss das Augenmerk auf die politische Organisation der Bauern gelegt werden und somit über die Methode der Messung von Sozialkapital hinausgegangen werden.

Keywords Brazilian Northeast Region, collective action, common pool resources, community governance, social capital

1. Introduction

This article seeks to provide an empirically informed description and analysis of the "*fundos de pasto*"[1] (FPs) land tenure system and to evaluate its prospects in the context of a rapidly modernizing economy. FPs are ancient and commonly held land areas located in the State of Bahia. Small-scale farming and grazing in common fields in the semi-arid *Caatinga* biome (dominated by dry scrub forest) and in the *Cerrado* biome (savanna forest) have been customary practices since the 16th century (*Fig. 1*). However, scholars have studied this system only scantily. Recent surges of land privatization in areas close to FPs, fueled by national policies seeking agricultural modernization, pose new challenges to their continued existence.

Aggressive land-grabbing[2] practices in the 1970s and 1980s sparked community resistance in some regions of the state of Bahia, causing FPs to be formally recognized. The expression "*fundos de pasto*" itself was coined at this crucial juncture when FPs were written into the Constitution of the state of Bahia in 1989. Currently, more than 15,000 families reside in more than 500 FP communities, distributed among 30 municipalities in the state (*Fig. 2*). A Bahia state law has defined a deadline (December 2017) for communities to declare themselves FPs. Additional communities have been discussing the matter and it is expected that the number of certified FPs may reach 700, involving 20,000 people. Most communities are located in the São Francisco River basin, in which families combine subsistence agriculture in individual plots with goat raising in common areas.

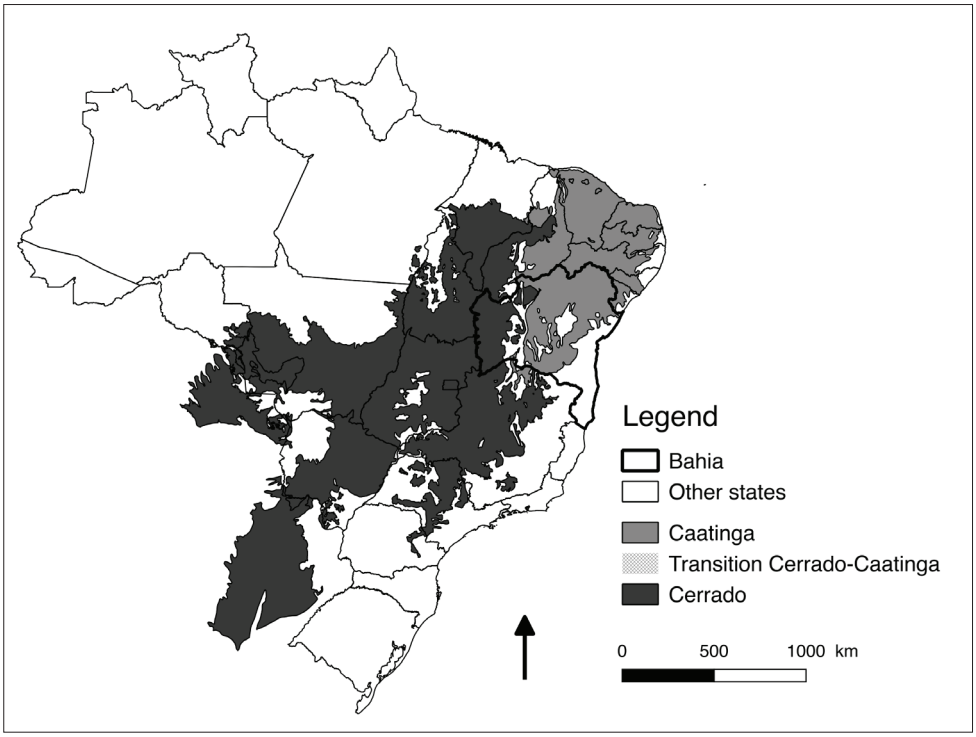

Fig. 1 Range of the Caatinga and Cerrado biomes. Source: Drawn by Stéphanie Nasuti

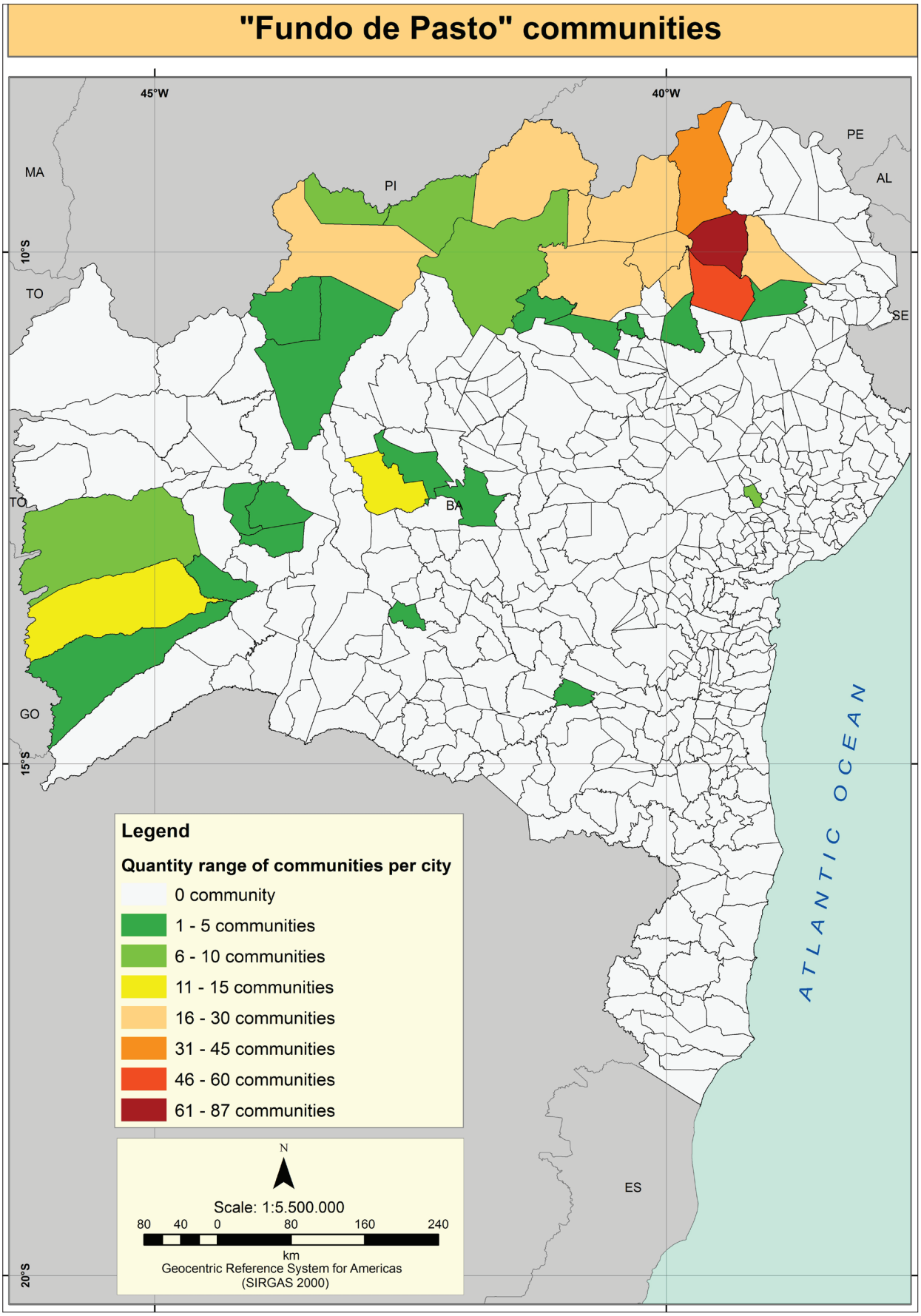

Fig. 2 Distribution of "fundos de pasto" communities among municipalities of the state of Bahia. Source: Ferraro 2008: 86

Since the 1980s, during drought periods, some of these communities started supplementing the food generated by their goatherds with subsistence crops. These crops have been crucial for the continued existence of the communities. Families worry about the long-term viability of the FP system. This raises issues typical of contexts marked by an unbalance between the uses and the carrying capacity of common pool resources (CPR) (*McKean* and *Ostrom* 2001).

Current trends suggest that FPs are under threat, as market-oriented activities and relations encroach and land turns into a commodity, a trend observed since early European capitalism (*Polanyi* 1957). Land grabbing and lack of appropriate policies further aggravate their situation. There is a strong relation between agricultural intensification and changes in property rights (*Heltberg* 2002), therefore FPs survive in pockets where market-oriented production is weak. It should be stressed that FPs are characteristically dedicated to farming and animal husbandry (goats), even if extractive activities may occur in some communities, in general extraction has little importance for FP dwellers.

In the Brazilian Northeast region, land tenure is a key question that shaped social, political and economic history since the early stages of colonization, in the 16th century. Since the end of slavery, in the late 1800s, a dualism has marked the region's social structure. In spite of a capitalist economy (sugar cane, cotton and cattle raising), a large peasant society, based on subsistence production, survived until the end of the 20th century and beyond. Remaining patriarchalism is the backbone of the domination system. In recent years, this greatest pocket of poverty in Brazil has been changing. Social, economic, and land tenure policies, together with growing urbanization, are bringing former groups of non-capitalist peasants into market relations (*Bursztyn* 1990). Nonetheless, some traditional forms of production are resilient and have not joined this trend.

More than a simple form of resistance to capitalism, these communities hold on to FPs for many reasons, such as deep-rooted cultural traits, environmental factors, technology, location, economy and government policies. Resistance to the privatization of commonly held lands is one of several strategies for sustainability or the mere persistence of these systems. The association of communal management systems with social equity and tenure security suggests the need to support them with public policies (*Heltberg* 2002). Conserving common property regimes for the sake of their existence value is not necessarily the only acceptable rationale. An alternative is to grant local resource users and related policy actors the freedom to exercise their publicly accorded choice of common property regimes. However, the outcome of this alternative may be the establishment of individually held rights, if they are viewed as more conducive to meeting collective needs.

In pre-capitalist societies and in several traditional communities, common fields were once a predominant mode of land use and occupation. They have been disappearing in the Western world since the 13th century, as enclosures and privatization of common lands expanded and individual property predominated (*Polanyi* 1957). In the Americas, this occurred mostly in the 19th century, with the collapse of colonialism, the end of slavery, and was intensified later with the adoption of barbed wire and agricultural intensification (*Razac* 2000).

The concept of the tragedy of the commons (*Hardin* 1968) has been a lasting reference for studies of cases such as the FPs. However, some authors criticize it pointing out its poor understanding of different property regimes (*Acheson* 2006; *Berkes* 2005; *Ostrom* et al. 1990; *Ostrom* et al. 1999; *Ostrom* 2002; *Feeny* et al. 2001; *Appell* 1993; *McCay* and *Acheson* 1987). They challenge *Hardin's* perspective in many aspects associated with the sustainable management of common resources. For them, the central issues related to sustainability are institutional and local, although they recognize the nested nature of local resource management. *Acheson* (2006) argues that there is a growing consensus about the institutional causes of environmental degradation. A focus on institutional failures, on the conditions for community governance, on social capital, and on collective action may, however, be confusing, since political conclusions derived from local analyses may lead to over-simplifications (*Heltberg* 2002; *Harriss* 2001).

Following this introduction, the article deals with methods of analysis of common property regimes, considering their singularity as a hybrid mode of production – both individual and collective – and presenting their variations. Following the results, the discussion evaluates aspects of sustainability usually ignored in analyses of community governance of CPR. Finally, our conclusions point towards tensions be-

tween economic development and the sustainability of CPR systems, associated with the conservation of extensive areas in the *Caatinga* biome. Our findings support the conclusion that the CPR analytical framework and its theoretical insights do not allow for a full understanding of these tensions. The analysis of other intervening factors demonstrates the need for a broader political approach, including public policies and the trends derived from an emerging land market.

2. Methods

A brief description of the natural setting of FPs is required. FPs exist mostly in the *Caatinga*, the dry scrub forest landscape characteristic of the semi-arid biome of Northeastern Brazil, including the interior of the state of Bahia. *Caatinga* covers about 11 percent of the Brazilian territory. Drought is a recurrent phenomenon there, due to scarce rains and irregular rainfall distribution. Although the average yearly precipitation may reach up to 800 millimeters, for several consecutive years rain may not come in the expected periods or may not come at all.[3]

Qualitative research probed representations and opinions held by the actors involved in CPR arrangements in a semi-arid region.

Our research, conducted between 2005 and 2008, followed four steps:

i) secondary data collection in state agencies, NGOs and religious institutions, concerning the general history of conflicts, organization and projects developed in FPs;

ii) participatory workshops in five FP territories, each lasting three days. They generated data on trends, challenges and threats operating at regional and local scales. They also clarified the possibilities of regional organization and collective action. This allowed the collection of primary data pertinent to more than 200 of the 500 known FP communities in the state of Bahia;

iii) additional participatory workshops with 35 FP communities, located in 10 different municipalities. In both series of workshops, selection of communities was random. The authors sought to keep samples in line with the diversity among municipalities and the differences inside each municipality. Contacts with additional communities were discontinued as the authors perceived diminishing returns of relevant facts and data. Each workshop lasted one day or half a day, involving 15 to 30 people in each community. Attendants were not selected; their participation was spontaneous and voluntary; they spoke in name of their families. Most were men between the ages of 18 and 60. Workshops included participatory mapping and discussions about FP history, context, problems, challenges, collective actions, agreements, organization and projects;

iv) semi-structured interviews with FP members and representatives of institutions that support them. This added accuracy to information on (a) community and FP history; (b) community structure, arrangements and production systems; (c) collective/individual areas, fencing, and neighborhood practices; (d) conflicts, both internal and external to the communities; (e) internal agreements, organization and FPs as a social movement; and (f) trends and projects for the future.

Further information on research procedures – including the names of all researched FP territories, communities, and municipalities – are found in *Ferraro* (2008). Most data on FP land tenure status are available in the administrative archives of the Agricultural Development Department, under the Bahia state government's Secretariat for Rural Development, whose headquarters are located in the state capital, Salvador (unfortunately, this database is not available online).

3. Results

This section presents results that are more closely pertinent to matters studied in the CPR literature.

3.1 Property regimes and arrangements in FPs

Resource regimes are, almost without exceptions, a mix of state, private and communal rights (*Grafton* 2000). Between the 16th and the early 19th centuries, areas that later became FPs were formally granted by the Portuguese crown to landlords engaged in cattle farming. After Brazil's independence in 1822, these areas remained without formal assignment and in some cases were abandoned by the grantees. People who had previously worked for those landlords or

survived on the borders of these lands occupied them and developed the FP system, based on customary law.

In 1989, the Constitution of the State of Bahia recognized FP communities' rights and empowered the state government to legalize both common lands and individual sections in FPs. Since then, FP systems assumed a complex combination of *de jure* (related to the form by which the state gave legal status to those lands) and *de facto* (based on customary law and rarely corresponding to legal aspects) arrangements. In 2013, state law 12,910 defined how FP lands were to be legalized. It stipulated how FP communities will be awarded collective user rights of public lands. The goal was to assure their physical, social and cultural livelihood. Communities must make statements identifying themselves as FPs. They must display the following traits: (i) communal land use, which may be associated with individual uses for the purpose of subsistence; (ii) animal husbandry, family-based agricultural production, poli-cultural activities for subsistence, local consumption, or trade, or low-impact extraction; (iii) a distinct culture, based on kinship, *compadrio*, or community solidarity associated with the preservation of traditions and social practices; (iv) appropriate use of natural resources and environmental preservation according to traditional practices; (v) location inside *Caatinga* or *Cerrado* biomes. User rights are based on 90-years, renewable, public grants made to community associations, by which the lands cannot be sold, leased or otherwise passed on to others.

This law caused an increase in the numbers of certified FPs. Since 2012, a few hundred non-certified communities filed for certification. Land tenure security is the major right gained by certified FPs, but the exact obligations derived from certification are under discussion, although the overall goal is sustainable management. These obligations are not the same as the rights and obligations linked to the certification of *quilombola* lands and communities (composed by descendants of escaped slaves), but these differences are a matter for a distinct text.

Every FP area has a mixed mode of property holding, with three types of arrangements: area 1 – common use regime and common property for grazing on native vegetation (*de jure* and *de facto*); area 2 – regime of private family possession (*de jure)* combined with common use (*de facto*); and area 3 – private use and possession of family plots (*de jure* and *de facto*). Following *Schlager* and *Ostrom* (1992), we found that the community owns area 1 (*de jure* and *de facto* right to access, collect, manage and exclude). Individuals are *de jure* proprietors of areas 2 and 3 (right to access, collect, manage, exclude and transfer ownership), but they are also *de facto* owners, since transfers of ownership are socially restricted and other rights are shared with the group, especially in area 2. These three typical areas exist in different proportions and arrangements in all FPs. *Figures 3* and *4* show graphic representations of these FP components, used in the subsequent figures.

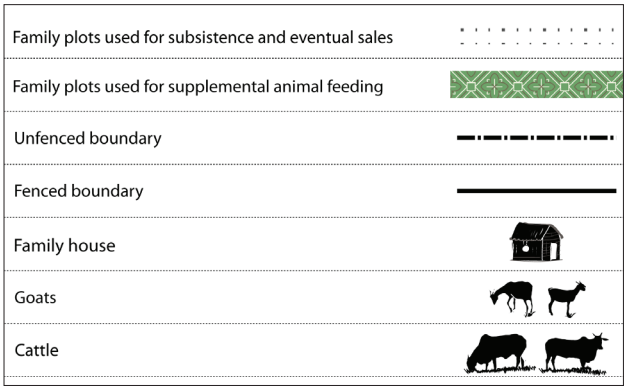

Fig. 3 Symbols used for FP components. Source: Authors' research, drawing by Stéphanie Nasuti

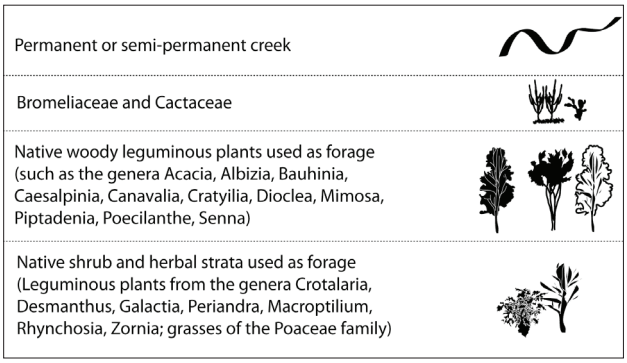

Fig. 4 Symbols used for components of the Caatinga biome. Source: Authors' research, drawing by Stéphanie Nasuti

The following is a collection of brief descriptions and interpretations of four distinct types of FPs, as identified by our research.

3.1.1 Community distribution throughout the FP (typical FP)

In this type, depicted in *Figure 5*, community dwellings are spread throughout the FP and families own (*de jure*) areas around their houses, usually unfenced.

The outer boundary surrounds the total expanse of the FP, which contains the three types of area. Most of it is in a typical regime of common possession and use. Rights and duties are restricted to an identified group, the community, which is entitled to its exclusive use and exercises access, management and exclusion rights. In this area, a common property regime prevails, although there are some communities that (still) do not want or are unable to prevent encroachment by neighboring farmers, who act as *free riders*. Another aspect of this arrangement is the reciprocity between adjacent FP communities. Since there is usually no fencing of the outer boundary, animals from neighboring communities graze in both FPs.

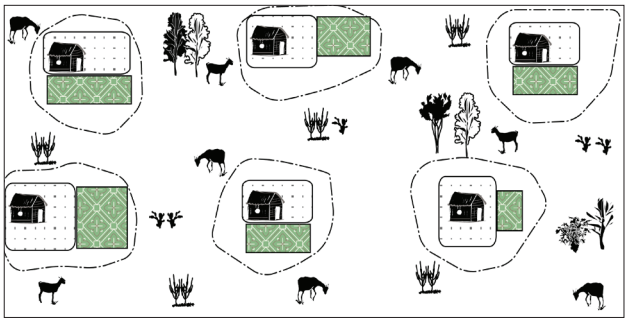

Fig. 5 Typical Fundo do Pasto. Source: Authors' research, drawing by Stéphanie Nasuti

Internal limits comprise the areas owned by families. This is where the communal use area and the family area meet. Both usually belong to the same individual property deed held by a family. However, the remaining vegetation is located in lands that are legally (*de jure*) private, but *de facto* they are part of a common grazing area. There is a subtle difference between FPs and the unfenced individual area. In FPs, everyone can collect wood (for family use only, never for sale), hunt and pick fruits. There is family exclusiveness for floral extraction and for hunting by third parties, although in general neighbors are allowed to engage in small-scale extraction (of plants and animals). However, the community imposes limits to the management by the owner family, such as a veto to the raising of free-ranging pigs.

Cultivated plots, orchards and the area immediately around the house compose the area for family use and possession. Normally, fenced plots are small (according to the regional pattern of land ownership in a semi-arid environment), i.e. not larger than three hectares. In drier regions or in cases of threats to animals, these sections include fenced pastures (for the protection and care of sick animals, for female animals who have recently given birth, and for young goats), and areas planted with hay and or *palma* plantations (*Opuntia ficus indica* Mill., an introduced cactus species used for foraging). However, these family areas are not absolute private property, since there are strong social constraints against their sale to outsiders. Alienation of properties, which distinguishes "full owners" from "proprietors", would place the family in the second category. However, this classification is not rigid, since alienation is legally possible, despite social constraints. Four social mechanisms limit the right to sell land to outsiders – community pressure; acquisition by the community itself; restricting the sale to individual parcels or individually owned and fenced crops; and simple community veto (leading sometimes to open conflict).

3.1.2 Community located in a concentrated area of the FP (backstage pasture)

In this case, community dwellings are concentrated in a small area of the FP. This type occurs in places with striking landscape contrasts (small humid valleys and high dry lands) (*Fig. 6*).

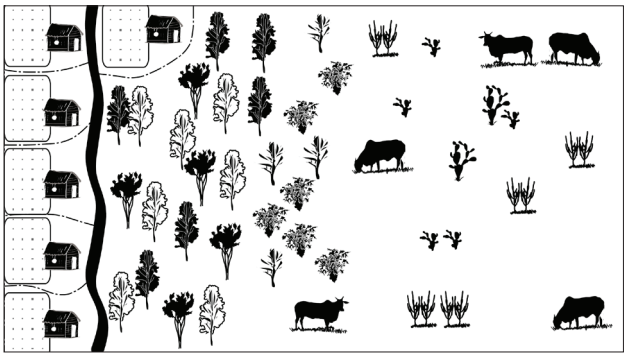

Fig. 6 Backstage pasture FP. Source: Authors' research, drawing by Stéphanie Nasuti

In this arrangement, cultivated plots occupy a higher proportion of the area when compared to other types of FPs. Animals are not kept around the houses (they roam more freely in the small humid valleys); there are no cultivated plots to help feed animals; the area around the dwellings has a denser arboreal vegetation, associated with humidity. Additionally, it is common in this arrangement to raise cattle instead of goats. Common grazing areas in this case are ecologically distinct from those in other types of FP and are usually quite extensive.

3.1.3 Community with a detached FP

In this less common type of FP, illustrated by *Figure 7*, all community dwellings are concentrated in one area. The FP may lie up to five kilometers away from the dwellings. This occurs in communities affected by the grabbing of common areas that were closer to the dwellings, or when the remaining or recovered lands have less water and poorer soils. This is an important case, since it illustrates the recovery of common areas that had ceased to operate as such. The cattle located between dwellings and the FP, on the right side, is a ranch belonging to a large landowner (*Fig. 7*).

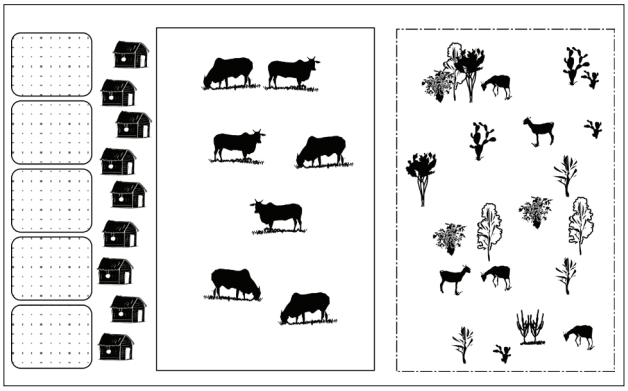

Fig. 7 Detached FP – the community separated from common areas by a cattle farm. Source: Authors' research, drawing by Stéphanie Nasuti

3.1.4 Community concentrated in a part of the FP – INCRA FP

Community dwellings are concentrated in a part of the FP, within areas legally owned by families. Commonly used and owned lands are located in a neighboring area. Although this type of FP is rare, it is relevant, since it is stimulated by the federal government's land reform agency (INCRA) (*Fig. 8*). This format simplifies the issuance of ownership titles, without the fragmentation of collective property. If family plots are not continuous, more than one title will be needed to properly document land ownership. In this case, the beneficiaries of land reform created a small village and each received a small plot located close to the village. The community received a collectively held area, located further away from the village.

We found that the most common type of FP is the first one ("typical"), depicted in *Figure 5*, in which dwellings are distributed more sparsely. The type depicted in *Figure 6* ("backstage") is more commonly found in the *Cerrado* biome and in hilly stretches of *Caatinga*, where the landscape is more diversified, comprising humid valleys and high plains ("*campos de altitude*").

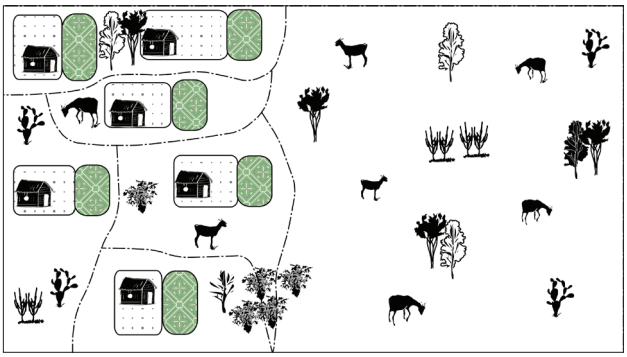

Fig. 8 INCRA FP. Source: Authors' research, drawing by Stéphanie Nasuti

4. Discussion

In this section, we review selected topics relevant to CPR analysis, on the basis of the empirical evidence collected in our research.

4.1 Conditions for the sustainable management of FPs as common pool resources

Ostrom et al. (1999) suggest that common resources and spaces be studied according to the characteristics of the resources and of their users. The conditions for governance and adaptive governance (*Dietz* et al. 2003) are usually associated with concepts of collective action (*Olson* 1971) and social capital. Our interpretation of user attributes as social capital adopts categories defined by *Putnam* et al. (1993) as social capital of the bonding and the bridging types.[4] Evaluation of the conditions for FP management made herein uses recommendations provided by many authors for the sustainable management of common resources and spaces (*Acheson* 2006; *Ostrom* 2002; 2003; 2005; *Ostrom* et al. 1990; 1999; *Dietz* et al. 2003; *Feeny* et al. 2001; *Schlager* and *Ostrom* 1992; *Wade* 1987). We understand that these studies, because they do not focus on the effects of external markets and policies, seek answers to specific questions about the role of local institutional arrangements in the explanation of varying CPR performance. The structure of institutional analysis does not cover the understanding of CPR dynamics, which depends increasingly on the driving forces of territorial struggles and of public policies.

4.2 Characteristics of the resources managed in FPs

Many resources are managed commonly in FPs. The most important ones are the fields used as natural grazing areas for goats and sheep. Therefore, our major analytical concern is curiously similar to the hypothetical case used by *Hardin* (1968) to illustrate the tragedy of the commons: overgrazing of common pastures. In this case, and in most cases, however, more than one common resource is involved – water, trees, game and collective installations. Discussed below are the aspects that characterize FP resources and help understand how they work and the challenges they face.

(i) Can the resource be delimited?
Inspection and/or fencing of lands would be enough to exclude free riders, both for grazing and floral extraction. Delimitation may not lead to fencing, however, depending on the level of external acknowledgment and respect. Internally, however, cultivated plots and palm plantations are fenced to protect them from animals, owned by both family and the larger community. Restrictions on access for the collection of wood, fruit, honey, game animals and for cultivation are usually made by agreement, not by fencing. In some places, fencing of large individual and legalized areas is an increasingly common – and conflictive – practice. Therefore, the resource can be delimited, both physically and by communally held rules.

(ii) Inspection and control over external influences and outside users.
Territoriality and the defense of boundaries are basic tenets for FPs in face of free riders. It is difficult to distinguish hospitality between neighbors from intrusion by free riders (*Sabourin* and *Marinozzi* 2001). Historically, the weak character of visible signs of community-imposed limits induced tolerance and reciprocity in grazing practices. There is also the habit (out of solidarity) of giving refuge to neighbors' animals, especially in the dry season. This habit becomes risky when large landowners ignore demarcations and treat FPs as open areas. FP communities with restricted grazing areas (less than 30 to 40 hectares per family) may engage in overgrazing. This is not to say that the avoidance of overgrazing is enough to guarantee sustainability, which depends on a wider set of factors. Nonetheless, we found that despite the existence of control mechanisms, both external and internal users may deteriorate resources.

(iii) Exclusion of free riders varies according to circumstances.
Neighboring private farmers generally do not keep natural grazing areas, substituting them with planted pastures for their private use. As they install their farms, they usually fence them off. When there is conflict between a private farm and a FP, the community commonly reacts by cutting the encroaching fences. When relations between the private farmer and the community are good, the community usually allows his animals to graze (which amounts to free riding) in the dry season. By law, the proximity of FPs to roads and villages makes fencing mandatory, to prevent the free circulation of animals and consequent hazards to passing vehicles. In the case of neighbors from another FP, exclusion varies according to circumstances. Nonetheless, we found that conflicts between FP communities caused by exclusions are rare. Normally, there is no fencing and each community is, in a certain sense, a free rider of the neighboring others. In other words, exclusion of free riders is possible and does happen.

(iv) Monitoring.
Land and trees are easier to monitor than fish (*Dietz* et al. 2003). Nevertheless, monitoring demands skills, time and rules. In some places, inspection teams are created, especially in the dry season, to exclude invading animals. Dwellers further organize themselves to inspect FP boundaries. Control varies also according to community arrangements. In typical FPs, control is easier, since family houses have a more favorable spatial distribution. In FPs in which pastures are distant from dwellings, monitoring and excluding free riders are difficult, although not impossible. In the cases of FPs physically detached from the community, however, free-rider control is almost impossible. Thus, there is a gradient of the viability of monitoring activities, but we recorded the occurrence of active and organized monitoring wherever it is viable.

(v) The resource is important for users.
For FPs, the biodiversity of the *Caatinga* biome translates into the availability of grazing plants and protein sources for animals, niches for hunting, floral extraction (dyes, tannin, medicinal plants, food, fruit, energy sources, construction and fencing materials), honey, and scenic beauty. One of the major requirements for the continuity of FPs is the sustainability of productive activities conducted in the CPR mode in the less than favorable ecological context of the biome. Small farmers living in the *Caatinga* have a culturally built

relationship with their natural environment, which emphasizes respect and conservation, because they do not have a market-oriented outlook and they have faced adverse climatic factors for many generations. Indeed, landscapes of FPs are strikingly different from those of individual properties. In FPs, the *Caatinga* flora, usually sparse and dry looking, develops into lush arboreal formations, with extensive soil coverage and shading.

Although FPs are the established mode of life for local groups, there are telling differences between communities. In places with a more rigorous climate (longer dry seasons), there is a strong economic dependence on common use areas, and weaker dependence on individual agricultural plots. In areas with more availability of water and more fertile soils, the importance of agricultural plots increases. When the land is not extensive enough to sustain a good number of animals, there is a tendency to place high value on subsistence plots. The same happens when families rear insufficient animals (20 goats or less is the rule of thumb figure). Therefore, the resource (land) is both basic for the livelihood of communities and subject to serious ecological limitations – drought, irregular rainfall and poor soils.

4.3 Technical and economic viability of conservation and recovery of the resource

FP management has been facing new and serious technical and biophysical challenges. One of them is the reduction of scrub forest biomass for the purpose of grazing during dry seasons. Until the 1980s, there was little or no need to complement animal grazing. Today, with the limitations that affect grazing areas, collective strategies are required during the seasons in which pastures are poor. There is also a need to define rules (such as limiting the size herds) for the use and recovery of certain areas, for the introduction of species that provide protein, and for the conservation of forage.

Caatinga biomass and species diversity are threatened by overgrazing, collection of firewood, charcoal production, deforestation of areas taken over by speculators, and the use of fire to clear the land for planting and/or improving pastures (both by communities and neighboring farms). Important species suffer from different pressures: the shoots of the *umbuzeiro* (*Spondias tuberosa*) are appreciated by goats; the bark of the *angico* (*Anadenanthera colubrinais*) is sold to hide processors; and many other tree species are cut for valuable timber. In one FP in which the situation is more serious, small farmers produced seedlings of native tree species, but they do not know how to protect seedlings from goat grazing. Apparently, the adoption of new techniques and rules by means of collective action has not kept up with the rate of ecological degradation.

4.4 Users' attributes (bonding type of social capital)

Together with the characteristics of the resource, this type of social capital entails problems and advantages linked to the quality of community cohesion. This is important for the analysis of aspects such as group cohesion, identity, trust, reciprocity and organization. These aspects enable groups to respond collectively to challenges, as distinct from individual actions ruled by the dilemma of collective action (*Olson* 1971) implicit in the "tragedy of the commons" (*Hardin* 1968). The following items deal with aspects and components of this type of social capital.

(i) Trust and reciprocity.
Solidarity, cohesion and trust in FPs are easily observed. They stem from tightly knit community relations (face-to-face communication) derived from kinship ties and from common historical and cultural roots. Loyalty of some rural dwellers in relation to large landowners also have strong historical roots, lying deep in the social and political culture of the entire Northeast region (*Bursztyn* 1984). To identify animals, many FPs mark both of their ears. One ear receives the ancestral family or clan mark, the other receives a mark that is unique to each resident of the FP. Care and feeding of stray animals belonging to other community members are an absolute requirement for good relationships among families. Episodes involving lack of care or undue appropriation of animals are very rare and generate public censure or even social exclusion. There still are many mutual help practices, such as *mutirão* (communally executed tasks) and exchanges of days and tasks. Therefore, this trait is clearly present in FPs.

(ii) Legitimacy and effectiveness of associations.
FP communities have internally recognized associations derived from their individual history, although older formats were different from current ones. Current associations emerged in the context of conflicts

over land tenure and the legitimization of FPs. Furthermore, they were induced by governmental agencies. The change from relative passivity to political assertiveness expresses the political role of literate young community members, who gain status at the expense of elderly (patriarchal) leaders. However, older leaders maintain a decisive non-formal role. In general, we found that associations have become more visible and more active, even if partially stimulated by outside political actors.

(iii) Membership criteria.
Membership criteria are a highly visible aspect, since the community is a clear extension of the families living in each FP. There is no record of someone becoming a part of a FP without being a close relative of a community member or without marrying into the community. In the very rare cases in which an outsider buys a property inside a FP, the buyer is restricted to that property and does not use common lands. Sons and daughters who get married have the right to establish themselves in the families' properties. When these properties are not extensive enough, a community meeting is called to decide if and where the new family will be allowed to establish itself. A neighbor of the community, even if poor, is not allowed to use the area. Members and non-members are thus clearly identified.

(iv) Known, flexible, simple, and adequate rules.
There are many simple and adequate rules in FPs, some of them applied quite effectively, such as the ban on free-ranging pigs, respect for internal boundaries, restrictions on wood collection, assignment of specific *umbuzeiro* trees to members of FP families, and the ban on selling wood taken from family properties. Most rules are created by FP communities and are incorporated into regulations when formal associations are created. However, the ability to create new rules in the face of conflictive situations seems to be less developed. Restrictions on the numbers of animals that can be raised per family are almost a taboo, because of the pastoral tradition that associates the number of animals to family welfare and security. Yet, as market connections become stronger, this issue is being increasingly discussed in communities affected by overgrazing.

(v) Control and sanctions.
Social proximity guarantees strong control among families. In FP communities, social relations have a strong overlap with kinship and family relations. The violation of a rule means damage done to a brother, cousin, uncle or father. Stealing animals is the most serious and shameful breach. When suspicion of stealing falls upon a family or a group of families, a process of exclusion is started. It can lead to a conflict expressed in social isolation, or in the appearance of rival factions that bicker over the control of the local association, or even in the termination of cooperative practices. The few cases of violations mentioned during our research were related to the sale of wood taken from the communal section of FPs. Normally, the sanction is immediate: the guilty person is called to appear before the community (the association or, more traditionally, the elders). When the violation includes the selling of community lands (a rare event), it leads to the complete breakdown of communal management. Sometimes violence and even deaths are recorded amongst quarreling groups.

(vi) Social learning, adaptation and agility in the face of conflicts.
The complexity of these aspects suggests directions for future studies. Interventions by the Third Sector have led to the adoption of new techniques (hay cultivation, silos, "protein stocks" generated by cultivating leguminous plants (*Fabaceae*), and the adoption of new productive practices (joint acquisition of breeders, fruit, meat and milk processing). When there is success, information circulates quickly among families and communities, generating social learning.

4.5 Attributes of groups of actors (bridging type of social capital)

The bridging type of social capital refers to the relations of FP communities with external actors, such as neighbors, public agents, and regional institutions. In the following paragraphs, we discuss these relations related to vertical social capital. This capital defines the ability of FP communities to influence private and public agents at different scales – from land tenure security to market relations and public policies in general.

(i) External recognition of local organizations and local property regimes.
At the federal and state levels, water and electricity utilities, personnel and managers of agrarian programs, and third sector activists clearly acknowledge FP communities. Land tenure security is the issue in which FPs achieved most progress since 1990, and

this depended on interactions with external actors. This is due to the acknowledgment of FPs by government agencies. Tenure security has helped stabilize even those communities that are not locally recognized.

(ii) Opportunities for communication and decision.
Participation in the planning of regional policies is still incipient in Brazil. FP leaders have not taken much advantage of the possibilities opened by such participation. However, they have been involved in national planning processes aimed at traditional populations and in political agendas of several social movements engaged in negotiations with the government. Dialogue with institutions has been *ad hoc*, linked to specific conflicts. When there is a conflictive situation, FP organizations seek contact with government agencies. The gains of such interactions for FPs and community stability are only dimly perceived.

(iii) Roles of government employees in conflicts.
Interventions by government employees as conflict mediators have become common, but they vary sharply. For example, environmental agencies do not get involved in typical environmental conflicts, such as those over wood and stone extraction, or water contamination. In the case of land tenure conflicts, however, state intervention is common, effective and recognized. However, it has not been enough to make FPs politically visible. This is proven by the 2012 law – the deadline for communities to define themselves as FPs rekindled the relations between communities and land agencies.

(iv) Dialogue between different forms of knowledge and availability of information.
FP communities interact sparsely with academic and research centers. There are research projects on *Caatinga* resource issues, most of them conducted by EMBRAPA (Brazil's major agricultural research agency), such as farm management, cattle ranching, economic botany, education, social organization and land tenure. However, no research center or group has a special focus on FPs. Normally, FP researchers have worked isolated from each other and limited to their respective institutions. There is but a single article (*Caron* 2001) focused on the strategy of dialogue between different forms of knowledge and on the use of modeling to support collective planning in communities. Several authors have published research articles on FPs, although not necessarily focused on the topic of dialogue between forms of knowledge (see *Sabourin* 2006; *Sabourin* et al.1999; *Carvalho* 2008; *Ferraro Junior* and *Bursztyn* 2008a; 2008b; 2010a; 2010b). With respect to exchanges between different forms of knowledge, FPs have a long way to go.

(v) A broader analytical framework is needed for understanding the challenges posed to FPs by expanded market relations.
The incorporation of land to capital, described by *Polanyi* (1957), redefines social relations and cultural traits, while also enhancing the role of land as a means of production. *Agrawal* (2001) notes the lack of studies about the impacts on CPR when local economies connect with external actors, and with processes and institutions linked to broader markets. The production chain of goat farming has many links (transporters, slaughterers, hide processors, meat packers, butchers, leather products industries, craftsmen, sellers and buyers). Actors involved in these links are less numerous than those who belong to FP communities, but are better organized and capitalized, as would be expected of smaller groups focused on narrow interests. *Cotrim* (1991) shows that FPs are kept on the edge of their business relations. Prices of animals are low, predictably leading to larger herds and overgrazing, because producers occupy the less profitable link of the productive chain. The more subordinated a productive activity is in a chain, the faster it reaches its biophysical limits. For *Ostrom* (1999), robust institutional arrangements could adapt to these new contextual drivers and successfully design new institutional arrangements. This can happen in cases in which social actors are not extremely poor and do not engage in practices that ostensibly degrade environmental resources, and if the alternative of massive out-migration is not being considered. We recorded a few attempts to achieve a degree of vertical integration of productive processes in order to achieve better standing in local markets.

(vi) The inside-out expansion of market relations.
Increased production directed to the market occurs through political, economic, cultural, social and technical mechanisms. It is not simply a process of confrontation with forces situated outside a subsistence-oriented community. A shift in consumption patterns, increased expectations (household electricity, gas stoves, new clothing, industrialized food, urban leisure) and improved schooling of youths (especially in technical schools) are factors that change the system in the direction of the more extensive circulation of money and goods. Wage employment of community

members also expands. Financial resources sent from family members who out-migrate (even if temporarily) and changes in expectations about property have increased the desire for land tenure security and the fencing off of progressively larger family plots. In some FPs, growing economic differences among families may impact negatively on social capital.

Figure 9 shows a rare, but symptomatic case of the impacts of the territorialization of market relations from inside out – we call it a "minimal FP". In this community, pressure in favor of the entitlement of large areas led to 80 percent of the area becoming family property. Collective use continued over only 20 percent of the FP. One of the small farmers, a community leader, is the only one who fenced off his individual area (using money obtained during a short working stint in the city of São Paulo). Other dwellers declared that they wish to raise fences, but lack the means to do so. In this case, the external boundary, next to the road, is also fenced off. The leader defends this format as a model for FPs and believes that even if all community members fence off their lands, the collective area will remain important to the lives of all families. He argues that the most important thing is the interconnection of the collective area, and not its extension.

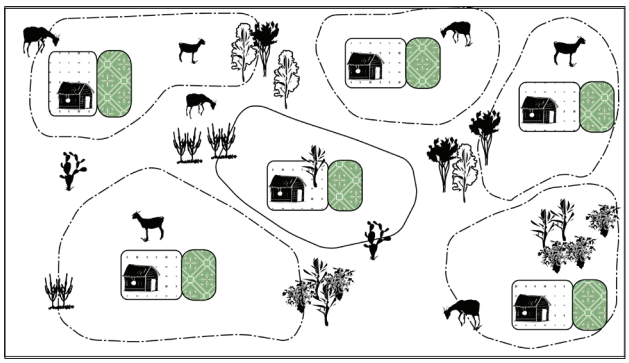

Fig. 9 Minimal FP. Source: Authors' research, drawing by Stéphanie Nasuti

As *Fehr* and *Fischbacher* (2003) suggest, even when a cooperative spirit prevails in a group, a few selfish individuals may weaken cooperation substantially. In fact, in contrast with the arguments of the aforementioned leader, when all individual lands are fenced off, collective areas will tend to be over-exploited and each producer will be concerned mostly about the management of his own pastures. If a collective area exists in the midst of individual areas, it will tend to be overgrazed. We found that, at least in this case, expanded market opportunities weaken traditional FP arrangements and tend to fulfill Hardin's prophecy of a tragedy of the commons.

(vii) The expansion of outside-inside market relations. The introduction of new techniques and the modernization of goat rearing induce changes in the FP system. There are techniques for preserving goat feed, notably hay feeding, as long as it is applied to native pastures. They can aid in the sustainable management of the *Caatinga* and in reclaiming degraded areas, both of interest to FPs. However, modernization usually results from the work of technicians who consider common grazing fields a barrier to modernization and to community success. Market relations coming from the outside also spring up by more direct means, such as the purchase, leasing or grabbing of FP lands for conventional agriculture. For *Agrawal* (2001), the arrival of new markets and technologies also impacts power relations between sub-groups inside the community.

Land scarcity experienced in the 1970s and the 1980s is the main aspect that determined current trends of CPR inside FPs. Although FP communities keep greater areas than other farming communities, in many of them land is not sufficient for the adoption of the FP model. In an extrapolation that does not reflect all individual cases (due to variations in climate, vegetation, and the relative value of other economic options), it is fair to state that 50 hectares per family comprise an area adequate for FP systems. Such a scale allows the weekly sale of one goat for R$ 70-80 (US$ 40-50, at the time of our field research), without overgrazing. This amount is considered enough to support a family that has other income sources (or agricultural plots).

We found that FPs have an average of 54.74 hectares per family. Since this area is sufficient for subsistence, it is arguable that, in the presence of social capital, CPR may be sustainably managed for only one generation. Therefore, the permanence of the system depends on dealing with demographic growth. FPs' sustainability is thus conditioned by a two-sided process – slower demographic growth and out-migration, unless the communities recover some of the grabbed areas. The birth rate among rural Northeasterners is among the highest in Brazil and this means that zero-growth will still require substantial out-migration of youths, which in itself may work against FP sustainability. On the other hand, the recovery of grabbed areas is very rare and there are no policies for it; therefore, such initiatives often result in extremely violent events.

4.6 The challenge of the neighboring type of social capital (close bridging)

When we considered this third type of social capital, we found that several factors connected to the relations between neighboring communities affect CPR management in FPs. They can be called close bridging social capital. Reciprocity between FP communities is common. Neighboring communities are typically related among themselves by having a common ancestor or, more recently, by marriages between youths. If these communities share their FPs, grazing areas increase and so do intervals between pasturing. Grazing pressure decreases and grazing is maximized, since animals do not eat young buds, which also helps the regeneration of the native vegetation.

The need to reclaim grazing areas poses challenges for close bridging. This happens when large areas must be set aside, on the boundaries of a community or between communities for more than one year to aid in their recovery. When engaged in these agreements, one community assumes that it will receive additional animals belonging to its neighbors and that they will reciprocate in the future. These arrangements seldom take place, though.

Another important aspect of this type of social capital lies in the cohesion among communities, best expressed during conflicts over land. Examples are mobilizations to remove fences installed by land grabbers, pressures on local governments to build roads and health services, and execution of common interest projects (such as building schools). Also relevant are efforts to spread the FP culture to other local residents.

4.7 Broader political challenges for CPR in FPs

It is fair to state that FP communities offer the environmental service of conserving portions of *Caatinga*. A broader public acknowledgment of this would improve support for CPR management, as it favors public actions such as research, development of appropriate technologies, credit, technical assistance, retrieval of areas taken by land grabbing, product certification (honey, fruit, meat), and even payments for environmental services (*Agrawal* and *Lemos* 2007). These developments demand political organization and public action, i.e., interaction between state and non-state actors, in a public arena, seeking to deepen democracy and to attain socially significant development. *Harriss* (2001: 27) calls this interaction the "dialectics of decentralization".

To make governments aware of this, interested groups need to organize, not only socially, but also politically, in order to build the political capital to be used in confrontations and in broad coalitions. Public acknowledgment and action related to the sustainability of the FP system is a type of capital that could be classified as broad bridging, because it depends on a set of relations between FPs, society and the state (political capital). Given the strong importance of political action, allies within the State become a crucial factor for the continued existence of FPs. Political action and public acknowledgment may strengthen communities in situations of conflict.

5. Conclusion

The theoretical and analytical tools commonly employed in research about CPR and social capital are necessary, but not sufficient to elucidate the case of FPs. The tendency to focus on the attributes of local institutions and relations renders this type of analysis insufficient (*Agrawal* 2001). The conceptual framework most commonly used in the analysis of CPR management has a local and communitarian focus, one that cannot explain the sustainability of communities, and of the resources and territories used by them. This framework does not gauge the complexity of FPs, forcing analysts to use other parameters. If the impacts of market relations and the tensions (internal and external) surrounding land tenure and community fragility in the face of external forces are not taken into account, the understanding of FPs sustainability results insufficient. This corroborates *Agrawal* (2001), who states that CPR studies neglect physical, social and institutional aspects of the external environment and have a tendency to focus on local institutions and to leave out fundamental variables. It reinforces also the criticism made by *Harriss* (2001) and *Heltberg* (2002) about the simplistic approaches and the political shortcomings found in some CPR studies. We also found that the CPR approach did not adequately deal with several crucial aspects that proved to be crucial to understand the challenges of the sustainability of FPs as a type of commons.

The concepts of social capital, bonding and bridging require broadening in order to be applied more ade-

quately in CPR studies. The concepts of close and broad bridging, discussed in this article, help identify the social and political capital required by the challenges of CPR management in FPs. The need to go beyond the concept of social capital, as defined by *Putnam* et al. (1993), is evident in many situations: in close bridging, we can gauge the mutual support among resisting communities, the isolation of large areas for *Caatinga* recovery, the extended hosting of animals from neighboring communities, and the partnerships in technical and commercial projects. In broad bridging, we perceive the circulation of information, the need for social communication in order to increase public recognition, and the appreciation of the *Caatinga* biome and of the community systems based on it.

In order to adequately understand CPR management in FPs, it is necessary to consider the impacts of the encroachment of market-oriented practices. These impacts are perceived in the subordination of FP communities in a productive sector or chain, or in the way by which market relations have gained strength in the area under study. *Caatinga* degradation due to overgrazing in FPs is still rare and recent. However, systematic land grabbing since the 1970s and 1980s cornered communities into the minimum land area necessary to survive from common grazing. Thus, there is a clear relation between social injustice, environmental injustice and degradation, and CPR management. Sustainability of communal systems depends more on political capital and public action and less on social capital.

Tension occurs when one evaluates the prospects of the continuity of common use areas in FPs. On the one hand, these areas show a tendency to decline, as they face actors endowed with capitalistic drive, political strength, financial and technical resources, and entrepreneurial capacity. On the other hand, there are national policies and a broad set of institutions that place a positive value on and seek to support traditional populations, such as FP communities. The resolution of this field of tension depends much on social and political organization and on the commitment of FP actors (especially younger community members) to the continued existence of this type of land occupation and use.

The current ability of the actors involved in CPR management is not enough to face these challenges. Social capital (inside communities) is high, but political capital (among communities) is low. The predictable tendency is one of progressive degradation of the natural resources and of the quality of life of the dwellers and, consequently, a general deterioration of the system.

As remnants of communal forms of land use, we find that FPs are looking at the prospect of extinction. Communal occupation and land use are often associated with the conservation of biodiversity and of other natural traits of the *Caatinga* biome. The convergence between FP practices and the concept of sustainability suggests that support given to these communal forms of land use may have a strong role in a broad strategy in favor of sustainable development. When the understanding of sustainability is restricted to social capital, the basic responsibility for dealing with challenges is implicitly placed on the shoulders of the communities themselves. When one looks at the wider political universe, considering the socio-environmental context and the political significance of the choices that may change this context, this responsibility is not automatically defined. FPs are a good example of the importance of public regulation going hand in hand with community action at the local level.

Notes

[1] A fair translation is "deep pastures".

[2] Illegal appropriations of land, using falsified documents obtained by means of bribing local notary officials. In Portuguese, it is commonly called "*grilagem*".

[3] The state of Bahia comprises also sections of *Cerrado*, a distinct savanna biome that covers about 24 percent of the Brazilian territory. Some savanna dwellers are organized into a distinct communal arrangement called "*fechos de pasto*", not studied herein.

[4] It is relevant to mention the contribution made by *Woolcock* (1998), who brings the notion of social capital into development theory and policy. He shows that social capital can both help and hinder economic advancement.

Acknowledgements

Research was in part supported by Brazil's Conselho Nacional de Desenvolvimento Científico e Tecnológico – CNPq. Illustrations were drawn by Dr. Stéphanie Nasuti, from original sketches by L.A. Ferraro Júnior.

References

Acheson, J.M. 2006: Institutional failure in resource management. – Annual Review of Anthropology. Harvard University **35**: 117-134

Agrawal, A. and *M.C. Lemos* 2007: A greener revolution in the making? Environmental governance in the 21st century. – Environment **48** (5): 35-45

Agrawal, A. 2001: Common property institutions and sustainable governance of resources. – World Development **29** (10): 1649-1672

Appell, G.N. 1993: Hardin's Myth of the Commons: The Tragedy of Conceptual Confusions. – Working Paper **8**. Social Transformation and Adaptation Research Institute, Phillips, ME

Berkes, F. 2005: Sistemas sociais, sistemas ecológicos e direitos de apropriação de recursos naturais. – In: *P.F. Vieira, F. Berkes* and *C.S. Seixas* (*editors*): Gestão integrada e participativa de recursos naturais: conceitos, métodos e experiências. – Secco/APED, Florianópolis/Brazil: 47-72

Bursztyn, M. 1984: O Poder dos Donos: planejamento e clientelismo no Nordeste. –Vozes, Petrópolis/Brazil

Bursztyn, M. 1990: O País das Alianças: elites e continuísmo no Brasil. – Vozes, Petrópolis/Brazil

Caron, P. 2001: Modélisation graphique et chorèmes: la gestion des parcours collectifs à Massaroca (Brésil du nordeste). – Mappemonde **62** (2): 17-21

Carvalho, F.P. 2008: Fundo de pasto: organização política e território. – Masters thesis in Social Sciences, Universidade Federal da Bahia, Salvador/Brazil

Cotrim, D.V.N. 1991: O pastoreio comunitário em Uauá: uma expressão da subordinação do trabalho ao capital. – Masters thesis in Social Sciences. UFBA, Salvador/Brazil

Dietz, T., E. Ostrom and *P.C. Ster* 2003: The struggle to govern the commons. –Science **302**: 1907-1912

Feeny, D., F. Berkes, B.J. McCay and *J.M.A. Acheson* 2001: Tragédia dos Comuns: Vinte e Dois Anos Depois. – In: *Diegues, A.C.S.* and *A. de C.C. Moreira* (eds.): Espaços e Recursos Naturais de Uso Comum., USP – Núcleo de Apoio à Pesquisa sobre Populações Humanas e Áreas Úmidas Brasileiras, São Paulo: 17-42

Fehr, E. and *U. Fischbacher* 2003: The Nature of Human Altruism. – Nature **425** (6960): 785-791

Ferraro Júnior, L.A. and *M. Bursztyn* 2008a Tradição e territorialidade nos fundos de pasto da Bahia: do capital social ao capital politico. – Anais do IV Encontro Nacional da Anppas, 2008, Brasília/Brasil. – Available at: http://www.anppas.org.br/encontro4/cd/ARQUIVOS/GT2-307-103-20080502173015.pdf, accessed 08/08/2014

Ferraro Júnior, L.A. and *M. Bursztyn* 2008b: Managing the Remaining Commons: Challenges to Sustainability in the Brazilian Northeast. – Working papers (Harvard University. Center for International Development. Online) **28**: 1-23. – Available at: https://www.hks.harvard.edu/index.php/content/download/69091/1249174/version/1/file/028.pdf, accessed 08/08/2014

Ferraro Júnior, L.A. and *M. Bursztyn* 2010a: Das sesmarias à resistência ao cercamento: razões históricas dos fundos de pasto. – Caderno CRH **23** (59): 385-400

Ferraro Júnior, L.A. and *M. Bursztyn* 2010b: Imaginário, emancipação e colonialidade: estudo das intervenções sociais no movimento dos fundos de pasto da Bahia. – Revista FAEEBA **19**: 109-120

Ferraro Júnior, L.A. 2008: Entre a invenção da tradição e a imaginação da sociedade sustentável: estudo de caso dos fundos de pasto na Bahia. – PhD dissertation (Sustainable Development), Centro de Desenvolvimento Sustentável, Universidade de Brasília/Brasília

Grafton, R.Q. 2000: Governance of the commons: a role for the State? – Land Economics **76** (4): 504-517

Hardin, G. 1968: The Tragedy of the Commons. – Science **162** (3959): 1243-1248

Harriss, J. 2001: Public action and the dialectics of decentralisation: against the myth of social capital as "the missing link in development". – Social Scientist **29** (11/12): 25-40

Heltberg, R. 2002: Property rights and natural resource management in developing countries. – Journal of Economic Surveys, Oxford/UK **116** (2): 189-214

McCay, B.J. and *J.M. Acheson* 1987: Human Ecology of the Commons. – In: *B.J. McCay* and *J.M. Acheson* (eds.): The Question of the Commons: The Culture and Ecology of Communal Resources. – Tucson: 1-36

McKean, A.M. and *E. Ostrom* 2001: Regimes de Propriedade Comum em Florestas: Somente uma Relíquia do Passado? – In: *Diegues, A.C.S.* and *A. de C.C. Moreira* (orgs.): Espaços e Recursos Naturais de Uso Comum. – USP – Núcleo de Apoio à Pesquisa sobre Populações Humanas e Áreas Úmidas Brasileiras, São Paulo: 79-96

Olson, M. 1971: The Logic of Collective Action: public goods and the theory of groups. – Cambridge/MA

Ostrom, E. 2002: Reformulating the Commons. – Ambiente e Sociedade **10**: 5-25

Ostrom, E. 2003: How types of goods and property rights jointly affect collective action. – Journal of Theoretical Politics **15** (3): 239-270

Ostrom, E. 2005: Understanding institutional diversity. – Princeton/NJ

Ostrom, E. 1990: Governing the Commons: the evolution of institutions for collective action. – Cambridge/MA

E. Ostrom, J. Burger, C.B. Field, R.B. Norgaard and *D. Policansky* 1999: Revisiting the Commons: local lessons, global challenges. – Science **284** (9): 278-282

Polanyi, K. 1957: The Great Transformation: The Political and Economic Origins of Our Time. – Boston/MA

Putnam, R.D., R. Leonardi and *R.Y. Nanetti* 1993: Making Democracy Work: Civic Traditions in Modern Italy. – Princeton/NJ

Razac, O. 2000: Histoire Politique du Barbelé. – Paris

Sabourin, E. 2006 Organizações formais e dispositivos coletivos dos agricultores no Nordeste Semi-árido. – In: *Sabourin, E.* (ed.): Associativismo, cooperativismo e economia familiar no meio rural. – UnB-Ceam-Neagri, Brasília

Sabourin, E. and *G. Marinozzi* 2001: Recomposição da Agricultura Familiar e Coordenação dos Produtores para a Gestão de Bens Comuns no Nordeste Brasileiro. –Política & Trabalho **17**: 80-90.

Sabourin, E., *P. Caron* and *P.C. Gamada Silva* 1999: O manejo dos "fundos de pasto" no nordeste baiano: um exemplo de reforma agrária sustentável. – Raízes – Revista de ciênciassociais e econômicas. – Campina Grande/Brazil, Universidade Federal da Paraíba, **18** (20): 90-102

Schlager, E. and *E. Ostrom* 1992: Property-Rights Regimes and Natural Resources: a Conceptual Analysis. – Land Economics **68** (3): 249-262

Wade, R. 1987: The management of common property resources: collective action as an alternative to privatization or state regulation. – Cambridge Journal of Economics **11** (2): 95-106

Woolcock, M. 1998: Social capital and economic development: Toward a theoretical synthesis and policy framework. – Theory and Society **27**: 151-208