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Rangeland in Marajó Island, Brazilian Amazon, a Long History of Commons for Small-Breeders

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Abstract

Rangelands cover almost one third of the earth's surface and are characterized by a low productivity and high sociocultural value. But the lack of recognition of the environmental, social and economic values of rangelands, along with the expansion of agribusiness, tourism and urban sprawl give rise to a rangeland dilemma. This dilemma is found in various regions of the world, where this set of factors leads to the generally irreversible destruction of the rangeland. The process is recent in the Amazon rangeland, such as the eastern part of Marajó Island and the Low Amazon wetlands. A survey conducted on 90 small breeders intended to describe, explain and model the dynamics and resilience of family and community socio-ecosystems in the rangeland area of the island of Marajó. The main result is the adaptation and resilience of small-breeders facing global change, especially the use of mobile phone and internet applied to marketing of local products. The major constraint seems to be the lack of coherent policies, both for local population livings and the maintenance of rangeland environmental services.

Introduction

Rangelands are a set of socio-ecosystems which are essential for humanity, especially in terms of water cycle, erosion reduction, biodiversity and carbon sequestration. Yet they are facing the expansion of human activity, largely agricultural, leading to the irreversible destruction of natural ecosystems for the implantation of intensive and unsustainable agricultural systems.

Collective use and landownership in rangeland area were the main rule for pastoral societies in all the continents over the past centuries and millenniums, even, according to the zone, diverse local mechanisms allowed avoiding resource degradation and maintaining sustainability of socio-ecosystems. The “Tragedy of Commons” (Hardin, 1968) showed the limits of common use, especially the land degradation linked to the mutual risk and private benefit regarding the resources. Olson (1999) also demonstrates that rational individuals, guided by their own interests, will not act collectively unless given specific incentives. But some authors support the idea that the value of collective action in terms of common goods can be a valid and sufficient incentive to participate in the action (Muller & Opp, 1986).

Ostrom (1990) shows that the prescriptions of current policies are based on external intervention, or on the privatization of the common resource considered. On the one hand, an external agency would have a cost that is not taken into account, and would need access to information, monitoring capacity, and reliability in sanctions. On the other hand, privatization is impossible in many cases because the common good cannot be divided, or its division cannot be done correctly. The author argues that there are many different solutions for different cases, and that more needs to be learned from the experience of the affected individuals.

The objective of this study was thus to compare the points of view of breeders and local stakeholders regarding the collective approach of rangeland management, in order to better understand the breeders' perceptions on their respective situation.

Methods and Study Site

The Marajo Island is located in the Pará state in Brazil, it is part of the Amazonian biome and at the mouth of the amazon river. Marajó has about four hundred thousand inhabitants located in sixteen counties, and 56% of its population lives in the rural area. The main towns are Soure, Salvaterra, Joanes, and Cachoeira do Arari. The archipelago is divided in two parts, the forest, that makes up for two thirds of the region, and rangeland, the last third, at the eastern part of the island. Marajó Island accounts for more than 38% of the buffaloes in Brazil (Lopes Filho, 2016). The buffalo was introduced to the Marajó Island in 1895 by a Pará breeder (Marques et al., 1998). The native pastures of poorly drained savannas in the archipelago cover 2.3 million hectares and are part of the 75 million hectares of native pastures in the Brazilian Amazon (Lopes Filho, 2016). These areas are devoid of forest and composed of grasses and other herbaceous and palm trees (Barbosa et al.,

2012). The herd made up of cattle and buffalo is raised loose in native pastures for the breeding and fattening of animals (De Oliveira et al., 2016).

Land concentration started in the eighteenth century when the island was divided into 50 sesmarias. The rangeland part was invested faster as control was easier than on the forest-covered land. It is during the Military Government period that land concentration was consolidated in Marajó, with the emergence of new landowners of both national and foreign companies (Barbosa et al., 2012). But few of the traditional inhabitants of Marajo were able to take advantage of the land ownership opportunity. The result today is a land situation made up of huge properties, which have become ranches, controlled by a few families, with diverse communities of descendants of original population on common land in the gaps. They represent 13% of the farms but use 90% of the land. Over the decades and centuries, small producers took over small plots of land that they cultivate for their subsistence. Population growth means that young people settling in must either divide up their parents' land or lease land from the ranches. Small producers represent 87% of the farms, with only 10% of the land (IBGE, 2017).

The livestock activity started in the 16th century with just a few animals on the farms, but it is only in the 19th century that buffaloes were introduced in the island. Zebus were introduced in the twentieth century, as well as pasture improvement with cultivated fodder. The lack of pasture management leads to serious pasture degradation. In order to stop this degradation, the investments in pasture management are very high, that's why until now the only recuperation method is to implement cultivated pastures, which destroy the natural rangeland. Family farming suffers from land access issues, common land management problems and the lack of policy. In addition to that, small producers find low public support due to the lack of land status and a weak awareness for capacity building in sustainable agriculture, food processing and social organization. It is very common to see short cycles of slash and burn agriculture, as well as the use of chemicals.

A survey by questionnaires on 90 small breeders located in five communities of Marajo rangeland area was developed in 1994, 2004 and 2019 in order to describe their farming systems and the dynamics, over the past 25 years. We established a diagnosis of production systems and agrarian systems in communities of grasslands in Marajó. This study made it possible to trace the evolutionary trajectories of these farms and communities.

Results

The main result is the adaptation and resilience of small-breeders facing global change, especially the use of mobile phone and internet applied to marketing of local products. Reduction of commons is also an important change. Additionally, it was noticed the strong demand of young people for high-level education, college and university. The producers found that the community aspect of agricultural production, livestock, as well as social life and culture, is always weakening due to the increase of individualism (fence in the areas), sales of large farms (which previously generated employment) and lack of leaders. However, some initiatives, especially in cheese production and fruit marketing (mainly Açaí) show relevant innovations (cooperatives, direct delivery to consumers, communication network, etc.). Above all, the major constraint seems to be the lack of coherent policies, both for local population livings and the maintenance of rangeland environmental services. The island lacks infrastructures in various sectors such as public health, education, access to clean water, energy, local transport, communication and the accommodation of tourists.

Two main points emerge from the analysis: on the one hand a progressive and problematic degradation of rangeland, on the other hand, the development of intensive agriculture supported by policies. Rangeland degradation is linked to a low productivity of the current land use, and has an environmental impact, especially on the biodiversity. We are witnessing a strong economic and social gap between farmers and small producers. Indeed, the development of intensive agriculture is worsening this gap and enhancing the environmental impact.

What are the future scenarios for the Marajó ecosystems? We can see three options. The first one is if no significant changes happen regarding policies, which we think will lead to more degradation of rangeland in ranching, more rural exodus especially within the youngest part of the population, and both land conflicts and local violence due to a serious social gap.

The second option is the development of intensive agriculture with investments allowed by specific policy, which could lead to economic development with local employment, but would also contribute to rangeland destruction and serious pollution risks.

The third option is an adequate rangeland public and/or private policy, which could lead in an appropriate land access for the landless and small producers, with technical and financial support to encourage rangeland management, and capacity building in sustainable agriculture and social issues.

Discussion [Conclusions/Implications]

We conclude on the importance of local/national and specific policy for the rangelands, waiting for the implementation of a global policy focused on this set of socio-ecosystems which are essential for the humanity, especially in terms of water cycle, erosion reduction, biodiversity and carbon sequestration. As Ostrom pointed out, national governments are often too small to govern global commons and too large to handle small-scale problems (Ostrom, 1998). As mentioned by Lemos and Agrawal (2006), we share the idea that decentralized environmental governance can be more efficient to bring local actors closer to decision making, and to promote greater participation.

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