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Diagnosis on the use and demand of natural resources in the "Padre Josímo Tavares" settlement, São José do Povo - MT

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Abstract. This article aimed to analyze the natural resources (pasture, conservation and preservation of springs) relating to biodiversity. Therefore, a review of online scientific articles, dissertations, books was previously carried out to support the concept of natural resources, environmental degradation, environmental management and sustainability. Subsequently, instruments were applied for data collection (detailed and systematic observations of photographic records) carried out in the field. It was diagnosed that the use of natural resources were being used for economic activities, with emphasis on extensive livestock, activities capable of resulting in major transformations of biodiversity, with consequent environmental degradation of soil, vegetation, and springs. Environmental Education is necessary to end the cycle of poverty and reduce the levels of degradation of natural resources, resulting in a better quality of life. The results showed that there are serious conflicts between the exploitation of natural resources, environmental education and environmental management to achieve a form of awareness.

Keywords: Rural settlements, natural resources, environmental degradation, sustainability

Introduction

Rural settlements face serious social and environmental problems. It is well known that the social issue is a problem passed down through generations, not changing reality. In association, public policies do not provide a good context in the man-nature relationship.

There is a negative impact on the environment when there is irregular use of natural resources, often as a result of the lack of choice of what to do on the land. In this sense, sustainability and environmental management become important factors for less environmental damage and degradation of nature.

In settlements, the environmental issue is more emerging, because the more natural resources are explored, the greater the environmental degradation. Without planning, these areas deplete their natural resources, due to a lack of strategy and sustainable planning.

Extensive livestock farming is a degrading activity in the settlement, compromising pastures and springs, resulting in erosive processes in the soil resulting from the trampling of cattle, as well as degradation of riparian forests and all their biota,

consequences of the misuse of natural resources. It is of fundamental importance to study the sustainability of natural resources in the settlements, thus seeking a way to recover natural resources and return the settlers to economic activities.

The aim of this article was to relate the use and demand of natural resources in the settlement "Padre Josímo Tavares", located in São José do Povo, where environmental planning will be necessary to consider the use and extraction of raw material from nature, without environmental degradation.

Methods

The method used in this research was carried out in two stages: a) Bibliographic research and, b) Field research, as described below.

The bibliographic research was based on information collected from books, dissertations, theses and scientific articles. Keywords were natural resources, environmental degradation, use and environmental impacts of natural resources, grazing and trampling of the soil, and erosion process in rural springs. The second stage was through a

qualitative technical approach and instrumented with detailed descriptive and exploratory research.

This research was submitted to the Ethics Committee of the Federal University of Rondonópolis and was approved within the ethical principles and current legislation.

In the field research, detailed and systematic field observations were carried out on natural resources. The information was collected by photographic records between September 1 and 15, 2019. The photographic records sought the conditions of pastures in the dry season, degraded areas, animal trampling, temporary and permanent springs; analyzing the state of conservation and preservation.

Location and a brief history of the old Jupιά farm and the emergence of the settlement "Padre Josímo Tavares"

The municipality of São José do Povo is located in the state of Mato Grosso, with an area of 444 square kilometers and, according to the demographic census of the Brazilian Institute of Geography and Statistics (IBGE), with an estimated population of 3,592 inhabitants in 2010. . Currently, it is estimated an urban population of 1,758 inhabitants and a rural area of 1,843 inhabitants.

São José do Povo borders the cities of Poxoréu, Guiratinga, Pedra Preta and Rondonópolis. It is considered one of the smallest municipalities in Mato Grosso. The economy is focused on management work and dairy farming activities on small rural properties. The municipality has four rural settlements: Sandrini settlement, Márcio Pereira settlement, João Pessoa settlement and Padre Josímo Tavares settlement. Still, there are the besiegers and the ranchers.

The Padre Josímo Tavares settlement is 7 kilometers from São José do Povo, on an old farm known as Jupιά. According to Silva (2009), the original farm belonged to Dona Jupιά, wife of José Salmen Hansem, founder of the municipality of São José do Povo. The owner has debts with the tax authorities and ended up losing the farm in court. The property was leased for planting cotton, but at low prices, the tenants stopped leasing the land and the farm was considered unproductive (SILVA, 2009).

In the settlement, there are 120 families that make up the "Dando as Mãos", mostly from Rondonópolis and neighborhoods such as Jardim Atlântico, Mato Grosso and Vila Operária. The Padre Josímo Tavares settlement is the largest in territorial extension in São José do Povo, with 3,152,432 hectares according to the 1999 Incra (National Institute of Colonization and Agrarian Reform) cadastral plan.

According to the associates, the camp lasted two years and four months, until they acquired the land. The lots were drawn. The camp started in March 1997, with approximately 800 people, coming from municipalities in the southern region of the state of Mato Grosso, mainly from Rondonópolis, Jaciara,

Jucimeira, Pedra Preta, Dom Aquino and Campo Verde.

The settled families are subdivided into four housing nuclei with an average of ten families. The area of the house is formed by closed forest, with good land for the cultivation, mainly, of rice and corn. The location of the *linhão* plots is, for the most part, pasture, formed by *Brachiaria* and *Panicum maximum*.



Figure 1. Image of the delimitation of the area of the Padre Josímo Tavares settlement. Source: Google Earth date: 30 Dec.2017 Prepared by the authors.

Environmental degradation and the natural resources of rural settlements

Environmental degradation is any adverse change in environmental quality (SÁNCHEZ, 2008; NEPOMUCENO; NACHORNIK, 2015). In rural settlements, it occurs due to the lack of information on how to manage natural resources, that is, on how to use them, adopting a conservation process. The environmental problem is usually associated with other problems. In many regions, it predates the settlements, which inherit soils that are not very fertile, eroded and/or lacking in water resources (BERGAMASCO; NORDER, 1996).

According to Guerra e Guerra (1980), the degraded use of natural resources, without observance of conservationism, represents a great threat to the well-being of all peoples. According to Carvalho et al. (2009) the environmental dimension includes the use of natural resources and also environmental degradation, since the preservation and conservation of the environment are fundamental for the maintenance of life.

Natural resources must be controlled within a society, both for their use and for their demand, that is, for individual or collective use. Environmental protection in rural settlements is treated in the same way in other rural establishments, that is, even with the concern for environmental protection, it is clear that the lands were already degraded before being occupied by settled families (ARAÚJO, 2017).

Cunha and Nunes (2008) reported that conflicts regarding the issues of exploitation of natural resources in rural settlements are emerging. In this sense, natural resources become the focus of a problem, because the more these resources are explored, the more they will be needed in the future.

Environmental impacts on springs in rural settlements

In the opinion of Sánchez (2008), one of the ways to study environmental impacts is to understand how human actions affect natural processes (eg, erosion processes). Human action interferes in the erosive process, in the following way: in the replacement of a forest by a culture, or in the opening of a road by a mine. As a result, the soil is exposed to the action of wind and rain, resulting in a higher rate of erosion.

According to Zoccal (2007) apud Paranhos (2012) erosion involves the disaggregation and transport of soils, being triggered and propagated through nature's own mechanisms, therefore, a natural process that is accelerated by human actions.

The most common form of erosion is the loss of the surface layer of the soil by the action of water, and this occurs under most physical and climatic conditions (ARAÚJO, 2010). This is common in springs, initiating erosive processes that begin to transport sediments, compromising water flow, water quality and also the biota that is in its surroundings and, mainly, the riparian forests.

Paranhos (2012) reported that human action has compromised nature due to the technification process. In this way, it is possible to relate erosion to the beginning of the introduction of techniques in that space.

In the rainy seasons, many springs have an increased flow or volume of water, thus impacting the local biota, as well as riparian forests due to the intensity of water flow. Many of these facts occur due to the activities and actions of the man who removes the vegetation, thus appearing, reflections on the hydrographic basins. When it occurs in springs, sediment often comes from other places, interrupting its cycle or lowering the flow of water.

According to Araújo (2010), soil degradation is not easily reversible because, from the moment a degradation or erosion process occurs, the process of formation and regeneration of the soil becomes slower and more complicated.

Environmental management in rural settlements

Planning is a rational and systematic way of determining the stage you are at, that is, where you want to go and what is the best way to reach your goal (SANTOS, 2004).

Environmental management is understood as planning, as management, and also as the sum of both. Environmental management is interpreted as the integration between planning, management and environmental policy. Environmental planning, on the other hand, is the study that aims at the

adequacy of use, control and protection of the environment, in addition to meeting social and governmental aspirations expressed or not in an environmental policy (SANTOS, 2004).

According to Sanchez and Silva (1995) apud Boherer and Dutra (2009), territorial planning is the entire planning process that involves strategies to resolve distortions, divergences or even conflicts in the relationship between ecological or natural attributes and socioeconomic aspects, aiming at sustainable development.

Even with the growing dominion over nature, man depends on natural resources, mainly wood and native pastures, to obtain food, materials, energy and medicinal products. The depletion of these resources, due to degradation with climate change, is associated with the decay of several civilizations (BOHERER; DUTRA, 2009).

The use of the term biodiversity comes from the expression biological diversity, which is associated with nature and implies a set of animal and plant species. Sánchez (2008) exposed that the concept of environment, in the field of environmental planning and management, becomes broad, multifaceted and malleable, that is, with several perspectives. Also, according to the author, it can be malleable, as it can be reduced according to the needs of the interests involved (DUTRA, 2009).

According to Bezerra and Munhoz (2000) environmental management is considered the set of principles, strategies, action guidelines and procedures to protect the integrity of physical and biotic environments, as well as that of the social groups that depend on it. The management of natural resources as a research area becomes a set of fundamental components in the process of regulating the mutual relations of sociocultural systems and also of the biophysical environment (NASCIMENTO; CURI, 2013).

Sustainability, anywhere on the planet, is the basis of concern when it involves natural resources for the very perpetuation of species, being a factor directly related to contemporary society. It is worth noting that, in order to be successful, it is necessary to involve governments and the awareness of citizens in their different forms of presentation (RIBEIRO; MENDES; SALANEK FILHO, 2008).

Spatial sustainability seeks the support capacity of the planet, given the unrestrained growth of the population and the consequent characteristics of irregular occupation of space (RIBEIRO; MENDES; SALANEK FILHO, 2008).

Results and discussion

Situation of pastures and alternative means during the dry season in the settlement "Padre Josímo Tavares"

During the systematic observations in the dry season, the pastures dried up and the animals started to depend on the rotation system of cattle management (Figure 2). The demands of food for animals become greater, because without pasture,

consequently, the milk and the production of milk derivatives for self-consumption decreased.



Figure 2. Situation of pastures in the dry season

In order to minimize problematic situations during the dry season, some have adopted alternative means, such as the management and cultivation of sugarcane for feed, to supply the animals nutritionally. Another strategy was the management or rotation of pastures during the dry season. In view of this, it was possible to perceive that the greater movement of the animals resulted in greater consumption of food and, consequently, the greater the trampling, impacting and wearing down the soil (Figure 3).



Figure 3. Cattle trampling

The trampling of cattle in springs and riparian forests compromise water quality and flow, causing silting due to sediments (ZANZARINE; ROSELEN, 2007).

Rotational grazing has been one of the main techniques adopted in the process of intensification of pastoral systems (MARTHA JUNIOR; BARIONI; VILELA; BARCELLOS, 2003). During the rest period, forage plant regrowth occurred in the absence of the animal. Cattle management was carried out by paddock (alternating days) so that cattle consumption was done in a way that there was no shortage of food (Figure 4)



Figure 4. Image of picket in the pasture of the settlement "Padre Josímo Tavares"

Many of the pastures are damaged by grazing, and natural revegetation is quite slow, especially when cattle are present. In addition to excessive grazing, it can be added, such as poor pasture management, its use too early or late and the poor distribution of cattle in the area (BERTONI; LOMBARDI NETO, 2012).

Excessive grazing also makes uncovered areas of vegetation appear, accelerating laminar erosion, so the soil surface is dragged away by erosion, making the area progressively less fertile. One of the results is a decrease in permeability. Soil compaction, caused by animal traffic, can be considered the most common cause of deteriorating compaction (MATOS, 2010).

In larger herds there is competition for the same pastures, which can exceed the natural productivity of the area and destroy the vegetation cover, accelerating erosion (ARAÚJO, 2010).

According to Guerra e Guerra (1980, p. 67), "*Soil conservation means, therefore, good use of the land (...)*". The negative impacts of livestock activity can be the risk of physical degradation of the soil, which can be caused by trampling animals, and consequently, cause strong soil compaction.

Conservation and preservation of springs in the settlement "Padre Josímo Tavares"

The springs are located on slopes or depressions in the terrain, or even at the base level represented by the local watercourse; they can also be considered perennial (continuous flow), temporary (flowing only in the rainy season) and ephemeral (which appear during the rain, remaining for only a few days or hours) (EDUARTE; RESENDE, 2009).

During the field observations, it was possible to observe temporary springs with a dry flow, and also with the presence of riparian forests and the water passage channel (Figure 5).



Figure 5. Temporary springs with dry flow



Figure 6. Temporary spring with the presence of standing water with solid waste

In some temporary springs, a point of water stopped in the drainage channel was observed. An evident fact is that in the rainy season there is the flow of water with the presence of solid waste.

Solid waste is generated by the community in the rural settlement. There is a lack of adequacy of the destination of these solids because, in the rainy season, these residues flow together with the rainwater, which impacts nature and causes concern for the local community. For this reason, it is necessary to plan for garbage to avoid contaminating water resources, soil, vegetation and the production of small farmers. According to Hirata (2003) apud Pereira (2012) reported that solid waste, domestic or industrial, contaminate surface and groundwater.

Costa Neto et al. (2008) reported that Environmental Education is one of the increments of rural activities, which are essential to break the cycle of poverty and, thus, reduce the levels of degradation of natural resources and aim for a better quality of life.

The presence of very thin riparian forests around the water flow channel was diagnosed in another temporary spring (Figure 7).

It is clear that the springs follow their cycle during the rainy season and also remain in the dry season with the presence of riparian forests. Riparian forests are strips of vegetation adjacent to

water bodies, along which they can occupy tens of meters from the banks (POESTER, 2012). Therefore, it becomes important to preserve these areas by the local community.

During field observations it was possible to find permanent springs with little water and the presence of some birds that are part of the fauna (Figure 8).



Figure 7. Temporary springs with the presence of riparian forests



Figure 8. Permanent spring with a very thin presence of riparian forest

These areas are places of refuge for various animals that make up the place, as most of them are pastures, and this moves away the wild animals that make up the fauna and flora of the place. The unsustainable use of water resources, through human activities, has promoted numerous environmental consequences, such as the decrease in stocks and also in the quality of water suitable for human consumption (PEREIRA, 2012). Preservation defends the untouchability of areas for future generations and is linked to the sustainable management of natural resources, so that they are not degraded (SILVA, 2011). In the present study, he highlighted the use and demand of natural resources for the use of pastures for extensive livestock. In this way, it was verified the degradation

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