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ECONOMIC-SOCIAL AND ENVIRONMENTAL ASSESSMENTS OF AGRICULTURAL PROPERTIES IN THE COUNTRYSIDE OF SÃO PAULO

Gustavo Delmilho
Zootechnist, Estância Guga, linha casarão
Nhandeara – SP, Brazil
https://orcid.org/0000-0001-6498-9581

Sergio Luis de Carvalho
Teacher, Department of Biology and Animal Science, UNESP
Ilha Solteira –SP, Brazil
https://orcid.org/0000-0002-8689-5700

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Abstract: The term sustainability is in global evidence. Consisting of a matter of extreme importance, dealing with the discussion involving agribusiness, productivity, preservation of fauna, flora, climate, use of natural resources, waste disposal, among other subjects. However, ways to improve this scenario are shown through the use of environmental education and community awareness. This study aimed to evaluate the social, economic and environmental aspects of rural properties in the Municipality of Floreal - SP, as well as the perception of farmers. Questionnaires were used with 40 producers containing 26 questions with different answers, addressing environmental issues and how they are treated. Factors such as: family composition, forms of work performed, and use of technologies were evaluated. Agricultural production was also estimated, in addition to factors resulting from these activities, such as production technologies, machinery used, soil conservation and riparian forests. From the answers, problems were revealed, as an example: lack of environmental perception, in addition to little relevance on the part of producers in this context. Another issue of paramount importance is the consequences, such as contamination of the environment, misuse of water resources present, among others. In the end, there was a lack of environmental education programs that would provide the rural producer with a balanced view of managing his activity, without neglecting the safety of his own health and the environment in which he lives.

Keywords: Environmental education. Sustainable development. Environment.

INTRODUCTION

Sustainability is a concept of great prominence today, especially when multiple climatic events have been providing worrying changes in the scenarios of the globe. Among others, there are concerns about the misuse of natural resources and the inappropriate disposal of waste, which increase the environmental commitment as a whole. In order to reduce this problem, the use of environmental education and community awareness has been common, proving to be great tools.

In order to increase profits and maximize productivity, the producer seeks to invest in the acquisition of inputs and technology, and in this, the acquisition of agricultural machinery, irrigation and pesticides come into play. However, these investments, although they bring productivity gains, need a conscious administrative look, as they bring with them a certain environmental impact, which results in soil compaction, desertification, river contamination, loss of biodiversity, uncontrolled expansion of agricultural borders and deforestation (MOURA, 2004).

Socio-economic development must be conceived under the support of the understanding of sustainability, in such a way, it is possible to have material gains with the preservation of resources and ecosystem services for several generations. As Brazil is a developing country, principles for the proper management of the natural resources must be kept in mind. And yet, contemplating ways to promote human well-being without accepting that its natural capital is used or desolate as if it had no value (CAVALCANTI, 1997).

The behavior of the human being, since it became a dominant part of the systems, has a tendency in the opposite direction to the maintenance of the environmental balance. The destabilization of equilibrium conditions, mainly due to population density, ends up

overcoming nature's capacity for tolerance, generating considerable negative impacts. As he cannot create the sources that meet his needs outside the ecological system, the human being imposes increasing pressure on the environment. Another worrying factor is the fact that man introduces toxic materials to the ecological system, products from different production scales, not receiving proper disposal, which perhaps generates severe imbalances in the environment (MORAES and JORDÃO, 2002).

It is necessary to balance the production of food with the preservation of nature. Therefore, resources must be used efficiently, that is, convert limited resources into economically viable useful products. This factor, however, implies reducing the damage caused to the environment during production, handling and commercialization, becoming one of the biggest challenges in production scales (PAZ et al., 2000).

In the context of analyzing factors of environmental perception, as well as the destination of solid waste in rural properties, some works were carried out. TOSTI (2014) in the region of Santa Fé do Sul – SP and MARTINS et al. (2015) in the municipality of Ilha Solteira - SP. Such works can provide important information for the planning of environmental education projects in the regions studied, in addition to promoting public policies capable of contributing to problem solving and decision making that ensure the maintenance and conservation of the environment (AMÉRICO et al., 2012).

GOALS

The objective of the present work was to verify, together with the owners of the municipality of Floreal, located in the countryside of the State of São Paulo, the environmental problems and how they are treated, in addition to questions of a socioeconomic nature, production, assistance and use of technologies, as well as as the environmental perception of the farmers so that subsidies are provided for the sustainable development of these properties.

METHODOLOGY

STUDY AREA AND ITS CLASSIFICATION

The municipality chosen was Floreal, characterized as a Brazilian municipality, in the State of São Paulo, located at a latitude of 20°40'36" South, and a longitude of 50°08'43" West, at an approximate altitude of 518 meters. The city's population is estimated at 3,003 inhabitants, according to the IBGE (2010). Agricultural gross domestic product is estimated at R$ 16,808.26. The municipality belongs to the micro-region of Auriflama - SP.

The predominant type of Biome is the Cerrado, and there are some traces of Atlantic Forest. The climate classification is "Aw" according to Köppen and Geiger. The average temperature is recorded at approximately 23° C and the average annual rainfall is 1000 mm (CLIMATE DATA, 2016).

The region where the city is currently located began with the creation of cattle and the establishment of cultivable areas, around 1899. Only in 1959 did the definitive foundation of the municipality take place. After incursions from central cities, two famous pioneers set up planting areas in the region, and Júlio Mineiro, one of the members of these incursions, established rice and beans in the region, later founding Vila Floresta, one of the main originators of the name (IBGE, 2010).

ANALYSIS METHOD

To assess the socioeconomic and environmental conditions of properties in the municipality of Floreal - SP, in 2018, a questionnaire was formulated containing 26

questions, covering several items referring to the main problems causing environmental degradation in the municipality, as well as socioeconomic issues. The methodology used is based on that of MARTINS et al. (2005).

Randomly, 40 properties were chosen, where the questionnaire was used together with the owners, who addressed relevant topics, such as: family composition, forms of work performed, agricultural crops, predominant vegetation, production technologies, water sources found, presence and conditions of riparian forests, facilities, agricultural machinery and environmental perception. In short, the farmer's view of the importance of environmental preservation. After analyzing the data, the responses were grouped for analysis by descriptive statistics, in which graphs and tables were prepared for the percentages obtained.

RESULTS
LOCAL FAMILY COMPOSITION

Analyzes of socioeconomic characteristics involving family composition were carried out, as well as age group in the properties, in addition to the source of family income. It can be seen in the graph in Ffigure 1 that most families are usually made up of 2 to 3 people, totaling 64%. Data obtained by MARTINS et al. (2005) in a study carried out in the municipality of Ilha Solteira - SP, were relatively similar, to the detriment that families had one to three people.

The reduction in the number of people in families has been mainly due to the search for opportunities in other municipalities, such as the professional practice. Studies of this type were also conducted by AMERICO et al. (2012) in Dobrada – SP, in which it was found that 80% of families are made up of 2 individuals, in agreement with the information obtained in this research.

FORMS OF WORK PERFORMED

The graph shown in figure 2 shows the different forms of work adopted by landowners, as well as resident producers. The vast majority of the forms adopted by them involve working at home (82.5%) while 3.94% work partially outside and 3.56% have their income through non-agricultural activities. Of the remainder, 10% of family members are dependents and do not work in any activity.

CHARACTERIZATION OF PRODUCTION UNITS IN FLOREAL - SP

In table 2, it can be seen that most properties (22%) have an area between 21 and 30 hectares, 15% between 31 and 40 hectares, while 12% are common for properties from 11 to 20, 41 to 50, 51 to 60. Only 10% of the properties have an area of up to 10 hectares and no property between 81 and 90 hectares was found in the study. Areas with sizes between 61 and 70 and 71 to 80, presented a total of 2.5% for both, while between 91 and 100 and greater than 100, presented 5% respectively.

MAIN CROPS USED

Regarding the types of crops used (Figure 3), it was observed that areas formed by pastures prevail (40%), composed mainly of signal grass, colony and elephant grass. In addition, 1.2% and 22% are formed, respectively, by areas with annual crops. Perennial crops correspond to 0.58% of the total areas, most of which are sugarcane and rubber trees. 36% of the areas are unexplored, most of which are limited and protected regions, such as APPs (Permanent Preservation Area). Similar data were observed in Dobrada-SP with productions very similar to those described previously (AMÉRICO, et al 2012).
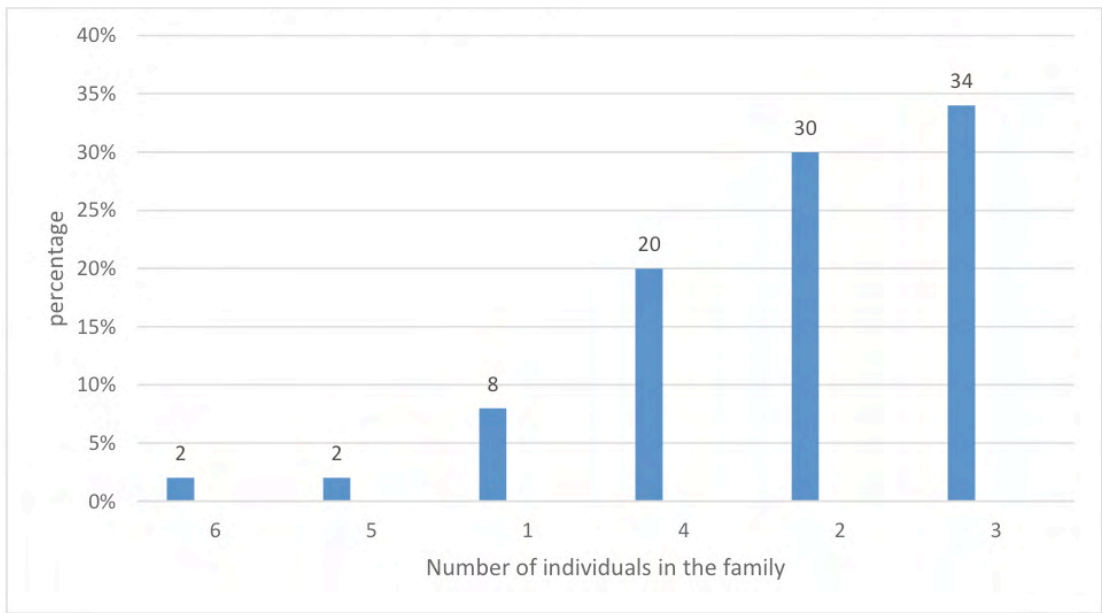
Figure 1: Family composition in agricultural properties evaluated in Floreal – SP, 2018.

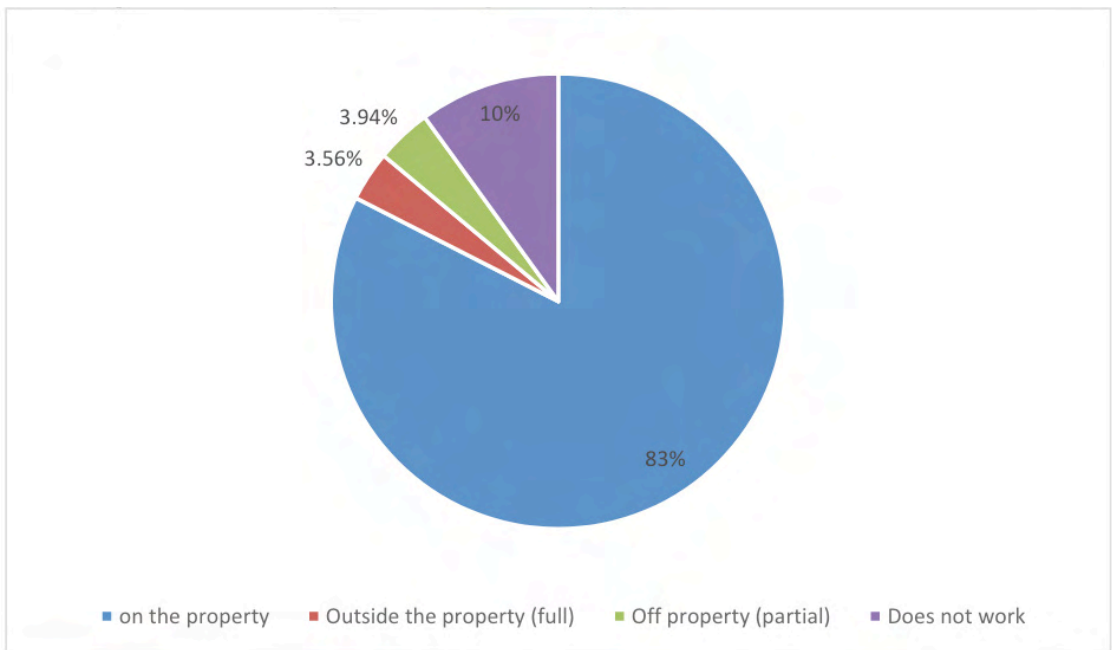Source: PREPARED BY THE AUTHOR, 2018.

Figure 2: Forms of work performed on agricultural properties evaluated in Floreal – SP, 2018.

Source: PREPARED BY THE AUTHOR, 2018.

Area (ha)	Number of properties	Percentage (%)
Until 10	4	10,00
11 to 20	5	12,50
21 to 30	9	22,50
31 to 40	6	15,00
41 to 50	5	12,50
51 to 60	5	12,50
61 to 70	1	2,50
71 to 80	1	2,50
81 to 90	0	0
91 to 100	2	5,00
Over 100	2	5,00
Total	**40**	**100,00**

Table 2: Number of properties and percentages of rural property areas in Floreal – SP, 2018.

Source: PREPARED BY THE AUTHOR, 2018.
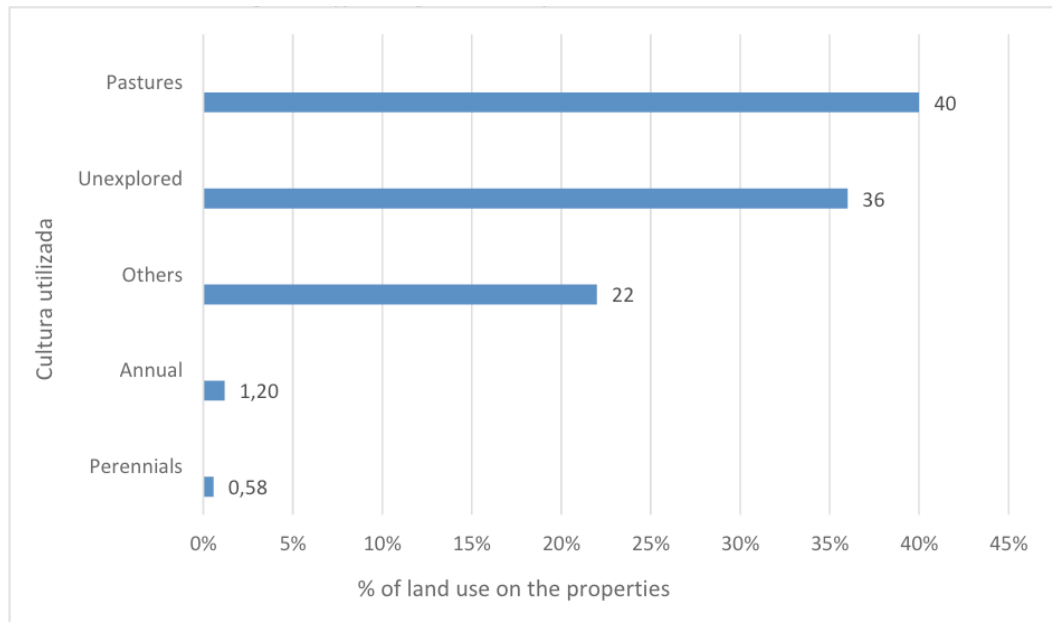
Figure 3: Types of agricultural crops evaluated in Floreal – SP, 2018.

Source: PREPARED BY THE AUTHOR, 2018.

CHARACTERIZATION OF THE PREDOMINANT VEGETATION

Observing the graph (figure 4) it is noted that most of the land is composed of signal grass (46.4%), evidencing the livestock vocation of the region, followed by sugarcane (28.4%). and rubber tree (12.33%). Other crops, such as corn, show 4.7% of cultivation in the region, evidencing the more intensified presence of agriculture and livestock.

MAIN PRODUCTION TECHNOLOGIES ADOPTED

It can be observed in Figure 5, the technological index used in the analyzed properties, mainly the use of level and terrace planting, representing 70% and 80% respectively. Of the total, soil analysis is carried out in 20% and the use of limestone, in 85%. Numerous other technologies are also widely used, such as mechanical soil preparation (70%) and mineral fertilization (43%). In addition, 40% of establishments apply herbicides and 88% use certified seeds. Green manuring consists of only 2.80%, being a very limited activity in the region. The technological index is considered to be high, mainly due to the large use of mechanization in agricultural production, soil preparation and level planting, mainly, to the detriment of the territorial extension of the municipality being relatively small. (AMERICA et al., 2012).

WATER SOURCES

In relation to water sources, the graph (figure 6) shows that most properties have a well (95%), followed by a stream, with 52.5%, while 15% have dams, weirs or lakes. Springs and rivers are present in 10% and 20% of establishments, respectively. Only 1% of properties have other types of water source.

RIPARIAN FOREST

Arranged in the graph of Figure 7, it is possible to observe how the riparian forests are distributed in the properties. It was found that 100% of them are present in rivers, 80% of the streams, have some type of riparian forest, but with only 12% of presence. Other formations, such as springs, have about 60% of presence, dams were not identified with any trace of riparian forest, as well as the places where the wells were established. The study carried out by Américo, et al. (2012) characterized that 86.7% of the properties interviewed had riparian forest close to a watercourse, be it a river, stream or spring.

FACILITIES PRESENT IN THE PROPERTIES

Described in Figure 8, it is observed that properties are equipped with several improvements, mainly residential houses, which are present in all evaluated locations. In addition, 95% of the establishments have a semi-artesian well, 93% have a corral and 88% have a shed. Stables are present in 28% of the properties, barn can be found in 25%, warehouses in 15% and silos in 5% of the studied sites.

ENVIRONMENTAL PERCEPTION

Based on the questionnaire (figure 9) as a way of evaluating the environmental perception, producers were asked about the importance attributed to water conservation, soil, vegetation, predominant fauna, quality of the environment, among others. As expected, the majority attributed high significance to the conservation of the natural resources described, especially water and soil, which were evaluated as important by 100% of the owners. The main reason for this is that the owners need irrigation and soil to plant their crops, thus having a very high regard for the items described above.
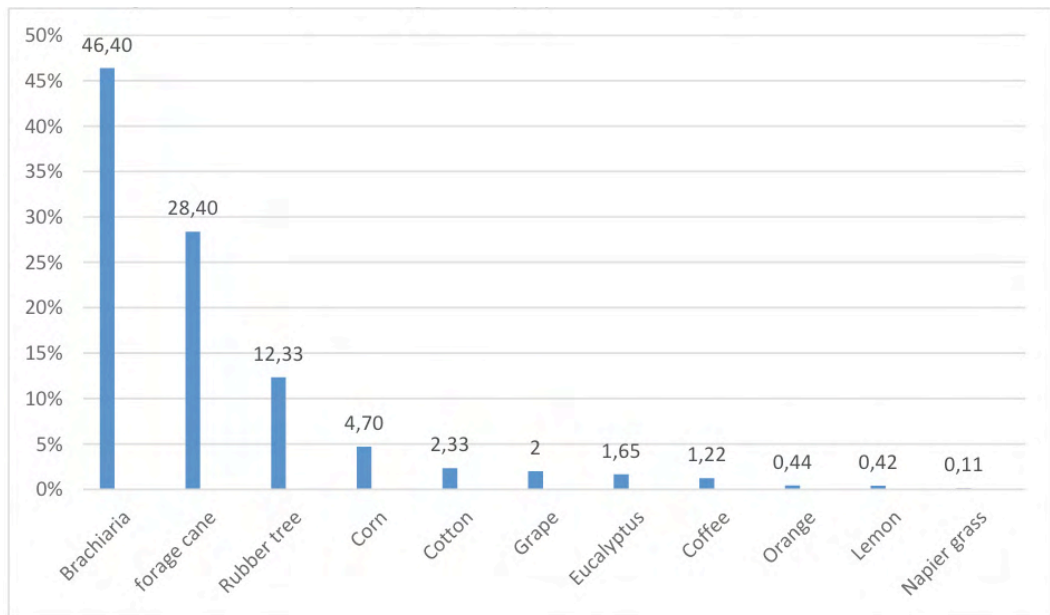
Figure 4: List of crops found on agricultural properties in Floreal - SP, 2018.

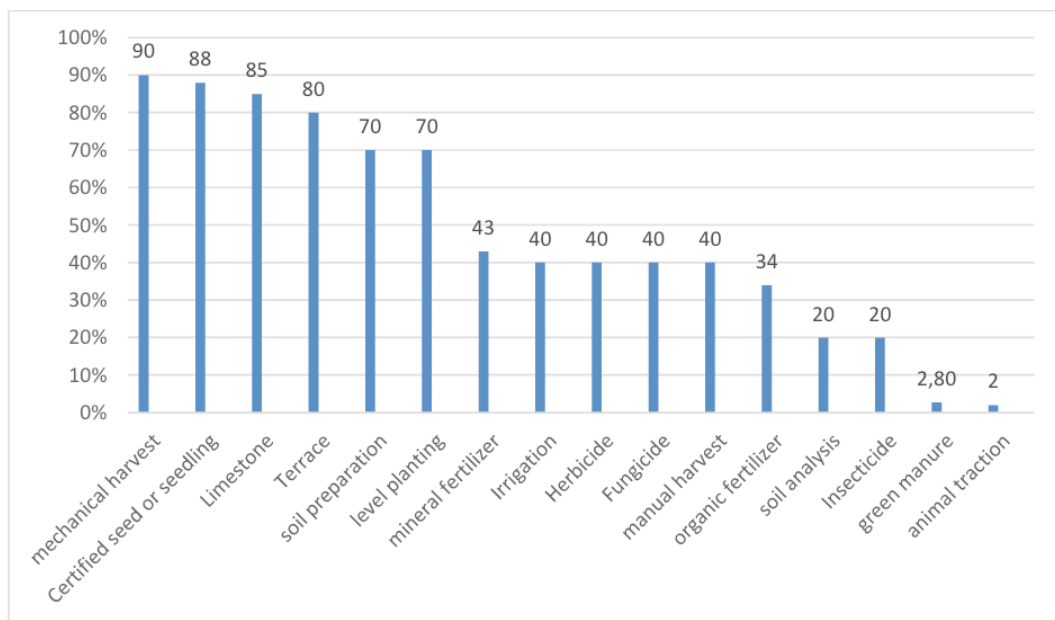Source: PREPARED BY THE AUTHOR, 2018.

Figure 5: List of production technologies adopted in the municipality of Floreal – SP. 2018
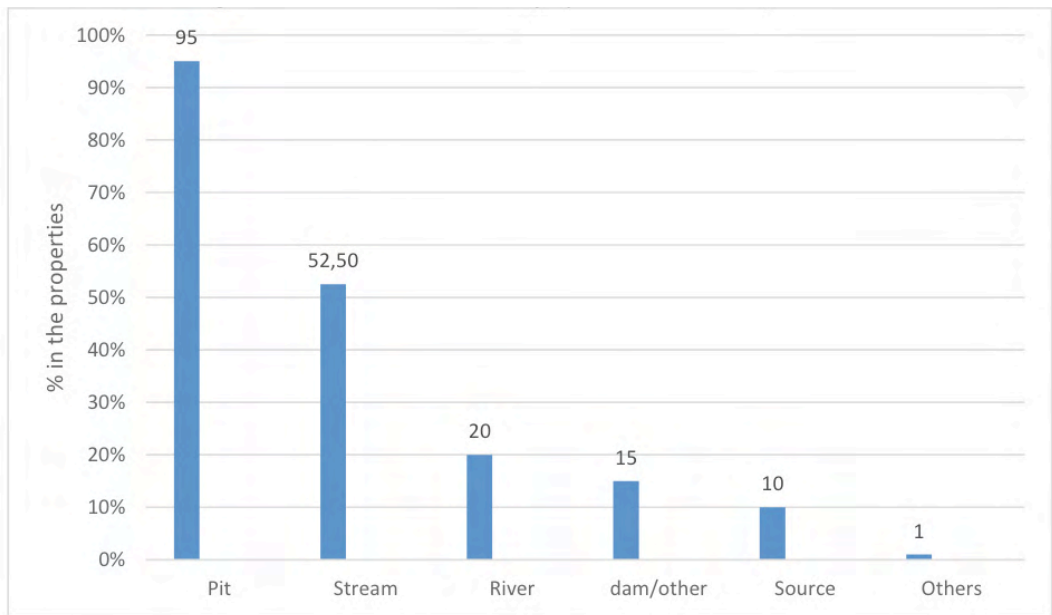
Source: PREPARED BY THE AUTHOR, 2018.

Figure 6: water sources found in the properties of Floreal – SP, 2018.
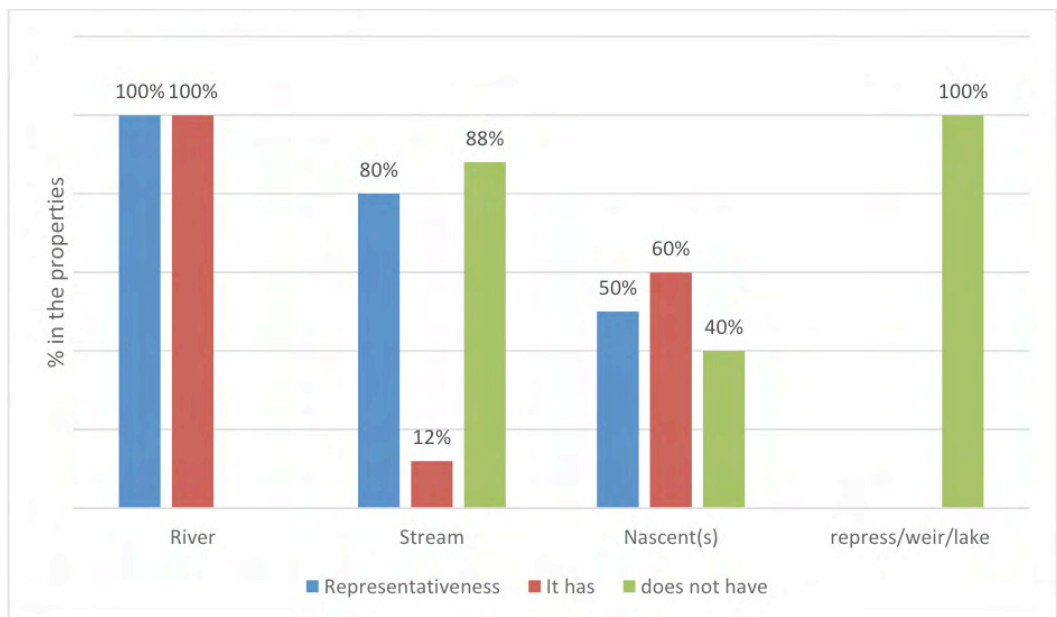
Source: PREPARED BY THE AUTHOR, 2018.

Figure 7: Proportion of riparian forest in different water sources in Floreal – SP, 2018.
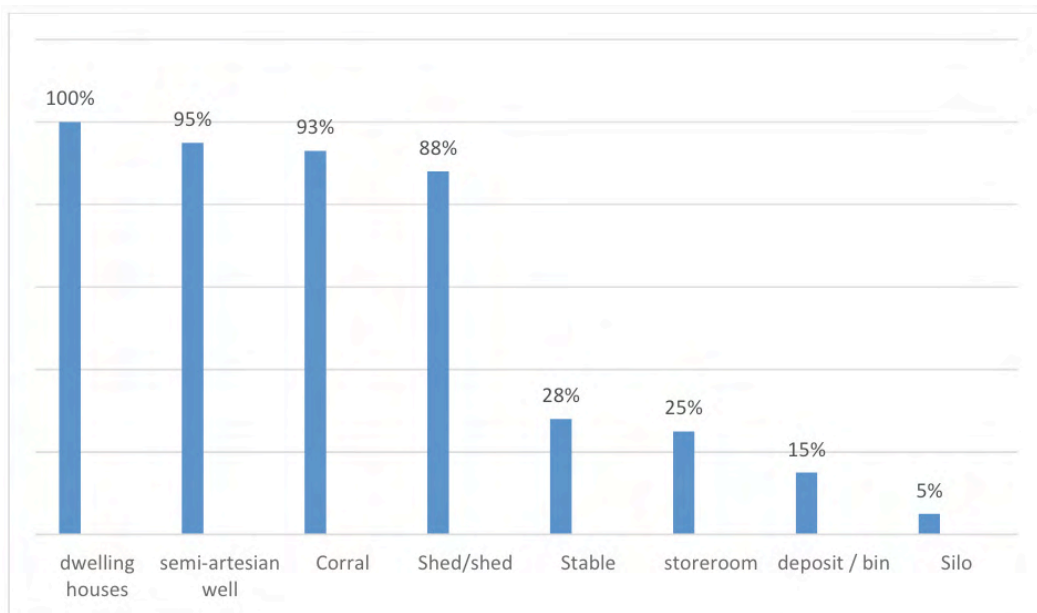
Source: PREPARED BY THE AUTHOR, 2018.

Figure 8: representation of the facilities used in the properties of Floreal - SP, 2018.
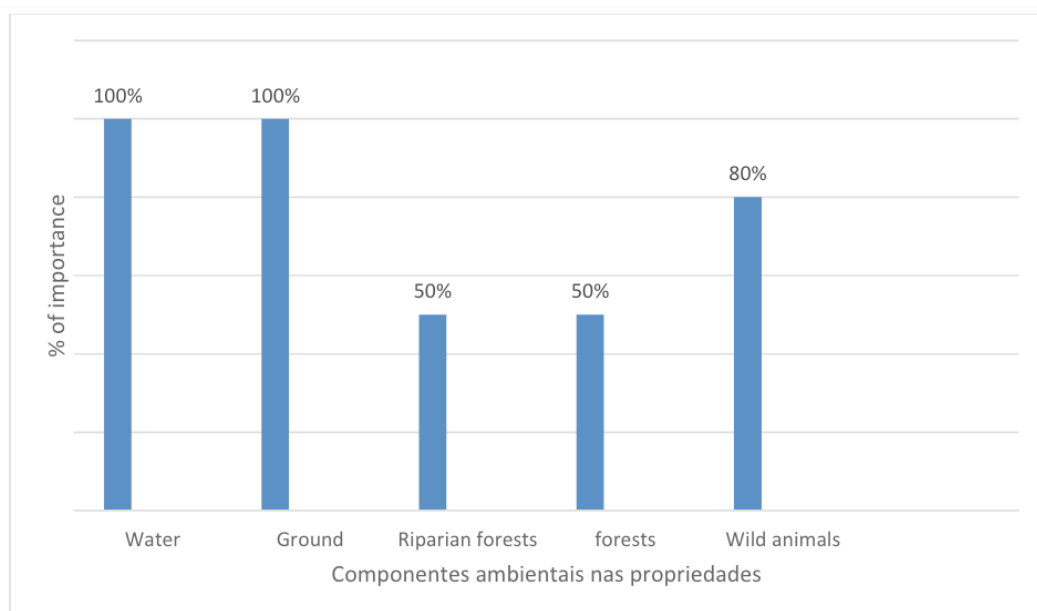
Source: PREPARED BY THE AUTHOR, 2018.

Figure 9: Degree of importance of conservation of different environmental components in Floreal – SP properties. 2018

Source: PREPARED BY THE AUTHOR, 2018.

Relevance was not the same for riparian forests, forests and wild animals (Figure 20), which did not receive much attention from producers, most of which were rated as medium importance, with conservation, respectively, for Matas items. riparian areas, forests, wild animals and others: 50%, 50%, 80% and 80%.

MACHINERY USED

With regard to agricultural machinery and equipment used on the properties (figure 10), 93% have a tractor, 89% a harrow for plowing, 88% a brush cutter, 70% a backpack sprayer and 60% a forage harvester. Of the establishments evaluated, 54% have a trailer, 44% a mechanical seeder, 33% some utility, 50% a shredder, 5% a leveling harrow, 4% a harvester and 2% have a cart. Most are questioned by the exacerbated prices of utilities, with high interest rates.

CONCLUSION

Not all producers are aware of the importance of the various natural elements of the environment present in each property, which can lead to difficulties in keeping them preserved. Part of some classic problems include: lack of conservation of water resources, and producers in general did not pay attention to this issue with such importance, in addition to the preservation and importance of riparian forests and other environmental resources.

A broad view of the environment is necessary, emphasizing environmental preservation, if this condition is not properly respected, the rural producer may face several problems, which directly impact production. This work demonstrates the great importance, as well as the weight, of socioeconomic and environmental analysis, in order to provide data that will bring subsidies for an adequate and sustainable conservation of the environment.
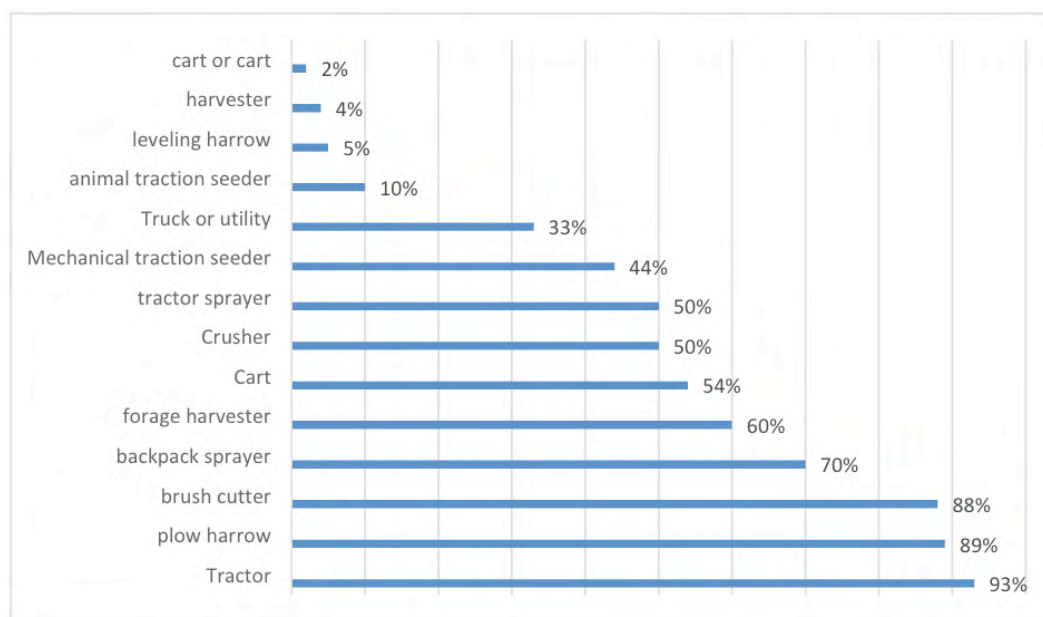

Figure 10: machinery and equipment present in the agricultural properties analyzed in Floreal – SP, 2018.

Source: PREPARED BY THE AUTHOR, 2018.

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