

Sociobiodiversity of non-wood forest products at open fairs in Rio Machado territory, Rondônia

The Amazon Forest is represented not only by biological diversity, but also by cultural variety, appropriation, exploitation and management of natural resources. However, the Amazon rainforest has been undergoing vast destruction, without considering the various possible uses of forest. In this sense, this research aims to evaluate the socioeconomic aspects and the diversity of non-wood forest products (PFNMs) commercialized in open fairs situated in the Rio Machado Territory, Rondônia/Brazil. The research was carried out in four municipalities: Cacoal, Espigão do Oeste, Pimenta Bueno and Primavera de Rondônia. Data collection took place through interviews employing a semi-structured form, in which socioeconomic issues, PFNMs traded at fairs and supplier species were demanded. The Shannon Index (H'), Sorensen Similarity (S) and the Importance Value (VI) for the species were generated. 41 fair dealers were interviewed. Labor force is predominantly familiar (92.68%) and the average monthly income from the commercialization of PFNMs was R\$ 251.70 (reais), in which the main commercialized PFM was the Brazil Nut (Castanha-do-pará – *Bertholletia excelsa*). Eleven forest species were cited, which indicated low species diversity (H' : 1.92), and it was verified a high similarity of PFNMs commercialized among the municipalities (S : 0.69). The species Brazil nut (*Bertholletia excelsa*), Açai palm (Açaí – *Euterpe oleracea*) and Cupuaçu (*Theobroma grandiflorum*) showed higher indicating (VI), demonstrating that PFNMs commercialization is still concentrated in few species.

Keywords: Amazon rainforest; Sustainability; Extractivism; Family Farming.

Sociobiodiversidade de produtos florestais não madeireiros em feiras livres no território do Rio Machado, Rondônia

A Floresta Amazônica é representada não apenas pela diversidade biológica, mas também pela variedade cultural, apropriação, exploração e manejo dos recursos naturais. No entanto, a floresta amazônica vem sofrendo grande destruição, sem considerar os diversos usos possíveis da floresta. Nesse sentido, esta pesquisa tem como objetivo avaliar os aspectos socioeconômicos e a diversidade de produtos florestais não madeireiros (PFNMs) comercializados em feiras livres situadas no Território do Rio Machado, Rondônia/Brasil. A pesquisa foi realizada em quatro municípios: Cacoal, Espigão do Oeste, Pimenta Bueno e Primavera de Rondônia. A coleta de dados deu-se por meio de entrevista por meio de formulário semiestruturado, no qual foram cobradas questões socioeconômicas, PFNMs negociados em feiras e espécies fornecedoras. Foram gerados o Índice de Shannon (H'), a Similaridade de Sorensen (S) e o Valor de Importância (VI) para as espécies. 41 negociantes de feiras foram entrevistados. A mão de obra é predominantemente familiar (92,68%) e a renda média mensal com a comercialização dos PFNMs foi de R \$ 251,70 (reais), sendo que o principal PFM comercializado foi a Castanha-do-pará (Castanha-do-pará - *Bertholletia excelsa*). Foram citadas onze espécies florestais, o que indicou baixa diversidade de espécies (H' : 1,92), e foi verificada uma alta similaridade dos PFNMs comercializados entre os municípios (S : 0,69). As espécies castanha do Brasil (*Bertholletia excelsa*), palmeira de açai (Açaí - *Euterpe oleracea*) e cupuaçu (*Theobroma grandiflorum*) apresentaram maior indicador (VI), demonstrando que a comercialização de PFNMs ainda está concentrada em poucas espécies.


Palavras-chave: Amazon rainforest; Sustentabilidade; Extrativismo; Agricultura Familiar.


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INTRODUCTION

The Amazon rainforest is represented by a vast biodiversity and is also known by its population socio-biodiversity (NODA et al., 2003; SNIF, 2018). However, socio-economic activities, such as logging, agriculture and animal husbandry, have caused strong pressures on natural resources in the Brazilian Amazon, such as the loss of biodiversity, environmental changes, soil and water degradation and social and economic impacts in communities that depend on the forest benefits, such as the use of Non-Wood Forest Products (PNFMs). This is often the main source of income for thousands of people in the Amazon (ANGELO et al., 2013).

There are several definitions of PNFMs, considering their origin, production, type of product, among other factors. According to FAO (1995), there are two ways to define the term. On the one hand, *Non-wood Forest Products* are products of biological origin, except wood, coming from forests. On the other hand, *Non-Timber Forest Products* are products of animal origin and social and environmental services (carbon sequestration, genetic conservation, etc.). Pedrozo et al. (2011) distinguishes PNFMs as products from native or planted forests, such as fruits, resins, oils, fibers, among others. The Amazon is considered one of the greatest forest regions with these resources.

Environmental and economic pressures have boosted research aimed at the use and conservation of forests in order to assess the economic and social importance of PNFMs, since the activity can contribute to a greater engagement of people and is a livelihood component (SANTOS et al., 2003; MIGUEL, 2007; FIEDLER et al., 2008; GONÇALVES et al., 2012).

In the Amazon region most of the extractive population is composed by family farmers, Indians and rubber tappers. In the cities the commercialization of these products usually occurs in markets, retailers and street markets. In each environment the degree of product transformation, price and presentation is different (REGO et al., 2011).

In Rondônia, street markets constitute a network of relationships based on a set of factors, such as: occupation, goods, financial flow of products and social and cultural information. All of them has been being recognized as an informal practice of family basis as a rule. These street markets take place periodically and are extremely important for the region, as they allow us to understand part of the transformations and intercommunications which expresses the daily life from different situations and places. In addition to the interaction between the trader, producer and consumer, there is an interaction between the countryside and the forest. Despite the socioeconomic relevance of street markets, research works neglect the economic, social, cultural and environmental aspects in these places. In this sense, scholars usually highlight marketing characters (GODOY et al., 2007).

Understanding the importance of open fairs for the region and the forests multiple uses is the objective of this study. In this sense, we intend to evaluate the socioeconomic aspects and the PNFMs diversity carried out in open fairs situated in the Rio Machado Territory, Rondônia.

MATERIALS AND METHODS

Location and characterization of the study area

The Rio Machado Territory is located in the southern portion of the state of Rondônia and comprises the following municipalities: Cacoal, Espigão do Oeste, Minister Andreazza, Parecis, Pimenta Bueno, Primavera de Rondônia and São Felipe. The study was conducted in open markets currently taking place in four municipalities (Figure 1).

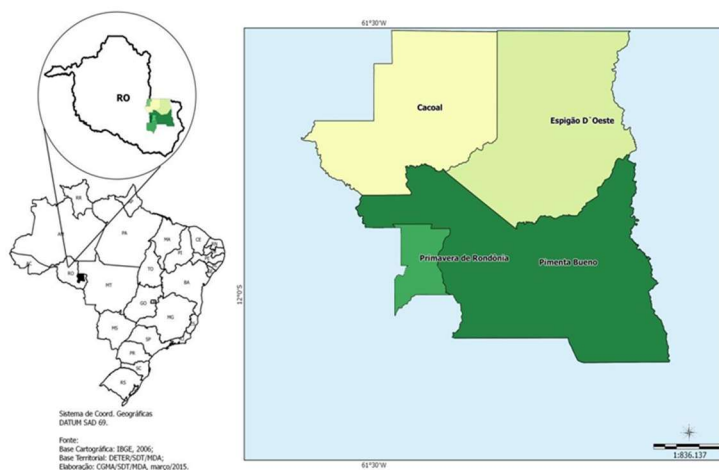


Figure 1: Location map of the municipalities of Cacoal, Espigão do Oeste, Pimenta Bueno and Primavera de Rondônia, object of study in the Territory Rio Machado – RO, 2019.

The state of Rondônia has a multiethnic and multicultural population and counts with approximately 1,562,409 inhabitants. Approximately 413,229 of that population reside in rural area (IBGE, 2010). Economy's main activities are plant and mineral extraction, agriculture and husbandry, and the exploitation of timber and rubber are the main activities of plant extraction.

In the Rio Machado Territory, the economy is based on agricultural and livestock production, being essential for development. Activities from plant extraction are carried out. This is the case of the açai fruit harvesting, essential vegetable oils, herbal medicines of popular medicine, fruits for the production of artisanal sweets and seeds and vines for the production of handicrafts.

The vegetation covers distinct types of territory. The Dense Rainforest is typified by the evergreen forest heterogeneity and is instituted by three strata: arboreal, shrub and sub-shrubs. The Open Rainforest is identified by the greater space between its trees and the significant amount of palm trees (*arecaceae*). There are still areas of Savannah or Cerrado, which are identified by small, tortuous trees, isolated or grouped on a grassy covering. The Cerrado trees generally involves thick and tuberos bark sparsely distributed, being common along the BR-364 axis between Pimenta Bueno and Cacoal. It is also worth mentioning the areas of Pioneer Formation and Anthropized Areas that also make up the vegetation cover of the territory.

Data collection

Data were collected from July 2018 to May 2019 with the aid of semi-structured questionnaires containing open and closed questions, which enabled the collection of information on socioeconomic

aspects, products and species commercialized. Before starting the information collection, the interviewees signed the Informed Consent Term, licensed by the Ethics Committee of the Federal University of Rondônia, CEP-UNIR through the number CAAE 82889417.1.0000.5300.

Data analysis

The PFNMS were evaluated for their potential use and through bibliographic consultations by the authors (ALMEIDA et al., 2014; ALMEIDA et al., 2012; ARAÚJO et al., 2012; ALMEIDA et al., 2010; COSTA et al., 2009; MATOS et al., 2009; MIGUEL, 2007; RODRIGUES et al., 2006; SILVA et al., 2006; BIAVATTI et al., 2006; NEVES et al., 2005; MOREIRA et al., 2002). From the data collected, socioeconomic information was generated from the interviewees and commercialized non-wood forest types and products.

For the supplier species, the Shanom-Wiener Diversity Index was generated, expressing the relative abundance of each species in relation to the total of species mentioned. The higher is the value found, the greater is the diversity. Besides, the Sorensen Similarity, which evaluated the presence or absence of species mentioned among the municipalities, rendered values between 0 to 1. The closer is the value to 1, the greater is the similarity of the species used by fair dealers in different cities. The Value of Importance measures the proportion of informants who cited a particular species, ranging from 0 to 1. The higher is the value, the more important are the species (MENDES et al., 2008; ALBUQUERQUE et al., 2010).

To offer comparable set of data information, the botanical nomenclature was supported by specialized literature and checked through the classification (APG IV) Angiosperm Phylogeny Group.

RESULTS AND DISCUSSION

41 fair dealers were interviewed, 15 in the municipality of Cacoal, 14 in Pimenta Bueno, 10 in Espigão do Oeste and 2 in Primavera de Rondônia, where the majority of informants were female (56.1%).

When women were asked about the work at open fairs, 86.96% said they helped with subsistence and supplemented family income, and 13.04% were heads of households. When it comes to family work, it is common for both parties or all members of the family to help with activities; while women deal with open fairs, selling the production of the family farm, husbands are often performing certain functions on the property, as animal husbandry, agriculture and others.

Oakley (2004) reports that in several cultures the female sex predominates as responsible for the cultivation and exploration of plant species in the family environment. For Alves et al. (2015) study about rural communities in Marapanim-Pará, 75% of interviewed families were headed by women.

One of the recurring themes in studies on women is their performance in regard to the use of natural resources, particularly when their practices are considered fundamental to the conservation of biodiversity (SILIPRANDI, 2000; DI CIOMMO, 2003). This practice, characterized predominantly by women, shows their directly linked to nature, as their work is based on stability, diversity and the search to family support. In Paulino Neves, in the Lençóis Maranhenses region, the handicraft of buriti linen is performed almost exclusively by women (SARAIVA et al., 2006).

The fair dealers' age ranged between 26 and 68 years, having in mind predominance between 26 to 45 age groups (68.3%). It is worth mentioning that the participation of young people in the fair's activities was verified. This represents a positive aspect, since the collaboration of young people is fundamental for the maintenance and continuity of familiar techniques and activities. Perpetuating local and traditional knowledge, the collaboration of young people is fundamental for the maintenance and the continuity of familiar techniques and activities, perpetuating local and traditional knowledge. However, during the reports many declared the intention to look forward opportunities outside the field. This demonstrates the lack of protecting policies capable of secure the motivation and permanence of these groups in rural areas.

The data also pointed out that 48.78% of informants are from other regions of the country, something that is consistent with the high cultural diversity of the population in the state of Rondônia. Brasil (1997) reports that 852,368 migrants entered the North Region in the 70s. In the state of Rondônia 57.4% were migrants from other states in the country.

This is comprehensive because Brazilian government has adopted an active and systematic policy of colonization of the Amazon, which according to Ianni (1979) was due to the fact that many workers in the Northeast and Center-South areas of the country were in a precarious and poor quality of life. In this context, the news of good, abundant and vacant land, the opening of roads, plant and animal extraction and the possibility of producing foodstuffs encouraged them to leave their homeland.

As for the level of education of the interviewed marketers, 73.17% did not complete elementary school. The poor level of education or even illiteracy is still a serious problem faced not only in the state of Rondônia, but also by the Brazilian population. This problem persists in the lack of confidence, since the informants who most participated and helped in all aspects of the interview had a higher level of education, and those who had little education were often the ones who least collaborated and felt afraid to relate any information, even the refusal to participate in the research.

In a study with rural communities, Alves et al. (2015) observed that 65.7% of the people interviewed did not finish elementary school. Another study by Miranda et al. (2004) found a low level of education at the Capanã Grande Extractive Reserve, in Manicoré-AM. Here population also has a high level of illiteracy and problems related to the producers' self-confidence.

In an exploratory study of extractivism in Acre, Embrapa (2000) interviewed 55 producers from the Chico Mendes Extractive Reserve in Brasileia-AC. The illiteracy rate was found to be approximately 67%. And in another study with 57 extractivist / riverine producers in Boca do Acre / AM, the results showed that 28% of the population is illiterate, while approximately 72% have incomplete primary education.

It was found that 78% of families consist of up to four (4) people, and of this total 36.6% is made up of only three (3) people. The data show that more and more families are smaller, which means that parents have few children and teenagers migrate frequently to the city in order to study, hardly returning to the household. For Rodrigues (2017), the migration of rural young people in the last three decades is related to the search for better living conditions and is reinforced by their difficulty in locomotion.

Of the number of respondents, 92.7% employ only family labor, which again corroborates the

importance of family farming. Most family members help in activities, requiring very little hired labor.

According to the 2017 Census of Agriculture (IBGE), Rondônia has 91,438 rural establishments within about 86% are family farms. Family farming is fundamental for the development of any region, both in the generation of income and in the production of food and in the reduction of the rural exodus. Besides, family farming is important to the use of agroecological practices, such as the diversification of crops and the reduction of use industrial inputs (GOMES, 2004).

Vilar et al. (2001) research about family farmers remaining from the quilombos in Oriximiná-PA found that 100% of the labor force during extractive activities was family-based. Generally, agroextractive families employ almost family labor and all members have a crucial role in some part of the production process. Another relevant factor is that these families are generally low-income, so there are scarce conditions to pay off outside labor.

In order to understand the social changes in the rural environment, during the research fair dealers were asked about how to obtain income. Only 1 informant totally dependent on the commercialization of PFM's. Anyway, the latter is an exceptional case, because this informant sells only a single product, processed açaí. The others are mainly engaged in agriculture, husbandry and PFM's commerce as an auxiliary income and diversification of production. (Table 1).

Table 1: Average Monthly Family Income and Average Monthly Income with the Commercialization of PFM's by fair dealers in the municipalities of the Rio Machado Territory Rural – RO.

Municipalities	Average Monthly Family Income ± SD (R\$)	Average Monthly Income with PFM's ± SD (R\$)
Cacoal	1.703,00 ± 975,86	183,00± 123,6
Espigão do Oeste	1.515,00 ± 292,54	212,00 ± 102,71
Pimenta Bueno	2.143,00 ± 753,00	369,00 ± 506,11
Primavera de Rondônia	900,00 ± 141,42	150,00 ± 70,71
Average Monthly Income per Marketer	1768,29 ± 801,15	252,00 ± 313,96

SD: Standard Deviation

Comparing the average monthly family income with the Brazilian Economic Classification Criterion, we noted that the interviewees have a socioeconomic stratum at level C1, which ranges from R\$ 1,691.44 to R\$ 2,965.19 monthly (ABEP, 2018). According to the interviewees, when asked about living conditions 70.74% considered the current condition to be good and about 29.26% claimed to have a reasonable life. According to the informants, regardless the economic classification framing them at level C1, most consider the current condition of life to be good.

Based on the research results, we analyzed how the scale of PFM's commercialization contributes to the monthly income of workers. The highest monthly income obtained from the market traders with the commercialization of PFM's was in the municipality of Pimenta Bueno, with an average of R\$ 369.00, followed by Espigão do Oeste (R\$ 212.00), Cacoal (R\$ 183.00) and Primavera de Rondônia (R\$ 150.00), the latter with the lowest average monthly income. It is clear that marketers do not depend exclusively on the commercialization of PFM's, representing 14.43% of the total income.

Despite the low influence of the PFM's on the income composition of families, they are relevant not

only due to the focus on forest conservation, but also as agents of productivity diversification in rural properties and part of the local diet, ensuring better food security for these families.

In a socioeconomic assessment of rural family production carried out by Maciel et al. (2008) in the Seringal Floresta at RESEX Chico Mendes, Xarupi-AC, it was concluded that extractive products lost their importance as a generator of gross income for families and that a great fall in the yield of extractive products was due to the lack of new products. All of this was caused by the lack of new niche markets and new production technologies.

When asked about the cultivation of PFNMs, 56.10% do not cultivate and 47.83% of them are gatherers; the 52.17% remaining resell PFNMs. The latter are thereby considered middlemen, usually buying raw material and profiting within a input margin on the product, according to the fair's marketing activity.

The remaining 43.90% who cultivate PFNMs on their properties reported that they carry out agroforestry systems, which is a system composed of different forest species, with agricultural crops mainly based on Açaí (*Euterpe oleracea*), Pupunha (*Bactris gasipaes*) Cupuaçu (*Theobroma grandiflorum*), Cocoa (*Theobroma cacao*), Urucum (*Bixa orellana*). Thus, the importance of these systems is perceived in small rural properties, as the producer ends up taking advantage of the space and cultivates several species in the same area, both agricultural and forestry, performing several benefits, such as soil and water conservation, carbon fixation, the diversification of productivity and better nutrition.

Ribeiro et al. (2008), Sawyer (2011) and Silva (2009) consider that agroextractive systems are beneficial to the environment, especially in regard to biodiversity conservation objectives. Due to a very diversified production, nonetheless based on a small scale property build upon strong diversity of native species, this set of activities causes little disturbance in the dynamics of ecosystems. Besides, these production systems are low-polluting, as they use little or no external input in the production units.

Regarding the processing of PFNMs, 56.66% reported performing some type of processing, such as cleaning, processing, weighing and packaging. Approximately 43.34% do not develop any type of processing, selling the product in the same way that it was collected and / or acquired, which results in a low profit value. The improvement of PFNMs could add value to the final product, improving profitability with its commercialization. The commercialization of PFNMs by marketers is considered a recent activity, as it has been implemented for approximately 15 years and may be related to the search and demand for these products by customers, causing marketers to start selling, or even for helping with income supplementation.

Souza (2012) adds that the difficulties are linked with the improvements in current management methods, directly linked with to the few years of extractivism acquaintance, by its turn related to tradition and know-how. This causes problems in respect of knowledge relay to those who will continue production.

There were categories of non-wood products such as oils, fruits and stems from 11 species belonging to 10 genera and 5 botanical families (Table 2), with 63.63% of the total species found belonging to two botanical families, Arecaceae and Fabaceae.

This result was similar to that observed by Ferreira et al. (2016), in a survey of non-wood forest species in the municipality of Juriti Velho-PA. The authors identified 16 useful species distributed in 11

botanical families. The most representative of which were Arecaceae (31.25%) and Fabaceae (12.5%).

The Fabaceae family represents one of the most significant groups of plants, both economically and quantitatively in number of species on the planet and is among the largest botanical families (JUDD et al., 2009).

Table 2: Family / Species / Product List explored by marketers and Location, Type of Uses, Part Used and Prices of PFNMs sold at open markets in the Rio Machado Territory – RO, 2019. Cacao (CAC), Pimenta Bueno (PBO), Espigão do Oeste (EOE), Primavera de Rondônia (PRO). Use Categories, Food (FO), Fuel (FU), Cosmetic (CO), Industrial (I), Wood (W), Medicinal (ME), Ornamental (O).

FAMILY / Sp.	Common Name	Local	Type of use	Part Used	Unity / (R\$)
ARECACEAE					
<i>Bactris gasipaes</i> kunth	Pupunha	CAC	FO	Stalk	Uni. / 10,00
<i>Attalea maripa</i> (Aubl) Mart	Naja	PBO	FO, FU	Stalk	Uni. / 30,00
<i>Euterpe oleracea</i> Mart.	Açaí	CAC, EOE, PBO e PRO	FO, I, W, ME, O	Fruit	250 g / 3,00
<i>Scheelea phalerata</i> Mart. ex Spreng	Bacuri	EOE	FO	Stalk	Uni. / 25,00
BIXACEAE					
<i>Bixa orellana</i> L.	Urucum	CAC, EOE, PBO e PRO	FO, ME	Fruit	40 g / 2,50
FABACEAE					
<i>Inga edulis</i> Mart.	Ingá de Metro	PBO e CAC	FO	Fruit	5 Uni. / 3,00
<i>Hymenaea courbaril</i> L.	Jatobá	CAC	FO, ME	Fruit	1 kg / 5,00
<i>Copaifera langsdorffii</i> Desf.	Copaíba	EOE	ME, CO	Oil	0,35 l / 20,00
LECYTHIDACEAE					
<i>Bertholletia excelsa</i> Bonpl	Castanha-do-pará	CAC, EOE, PBO e PRO	FO, ME	Fruit	1 kg / 7,50
MALVACEAE					
<i>Theobroma grandiflorum</i> (Willd. ex Spreng.) K. Schum	Cupuaçu	CAC, EOE, PBO e PRO	FO, CO	Fruit	200 g / 2,50
<i>Theobroma cacao</i> L.	Cacau	EOE	FO, ME	Fruit	250 g / 3,00
PRODUCT					
-	Honey	EOE, PBO e CAC	FO e ME	-	1 l / 55,00

Among the parts used we point out the fruits followed by stem. The fruits are used exclusively for human and family consumption and the most commercialized was the Brazil nut.

The low variation found in the study resulted in a low diversity of species mentioned in the evaluated fairs (Table 3). Espigão do Oeste was the municipality with the greatest diversity of species (1.76). In this municipality marketers listed 07 (seven) species.

Table 3: Shannon-Wiener Index (H') for forest species commercialized in open markets in the Rural Territory Rio Machado municipalities – RO, 2019.

Parameteres/Municipalities	Cacao	Espigão do Oeste	Pimenta Bueno	Primavera de RO
Sp wealth	6	7	6	5
Observations (N)	14	14	17	5
Shannon-Wiener (H')	1,72	1,76	1,65	1,6

RO: Rondônia. N: Observations.

The low number of aforementioned supplier species may be associated with the lack of consumers

acquaintance and, consequently, the absence of demand for certain products, which forces fair dealers to meet the demand concentrating business on the most sought products. Respondents report this situation when asked why they only commercialize the products mentioned. In this item, 41.46% stated that other products are difficult to access, 36, 58% said that there is no demand for other products and 21.95% said it was not economically viable.

Hence, there is a certain degree of difficulty in regard to obtain certain types of PFNM material in its natural environment, as well as in transportation, processing costs, labor to manufacture a possible bioproduct, the lack of demand and the demand for several other species of PFNM material and consequently their commercialization in open fairs in the Rio Machado Territory Region.

In terms of the similarity index, the present investigation indicates that supplier species of PFNMs are similar among the Rio Machado Territory fairs. The greatest similarity straddled in the municipalities of Espigão do Oeste and Primavera de Rondônia, with (0.83), and given to the fact they are distinct municipalities, similarity is mere coincidence. The lowest similarity index found was between the municipalities of Espigão do Oeste and Cacoal (0.57).

Table 4: Sorensen Similarity Index between the municipalities of the Rural Territory Rio Machado – RO, 2019. Cacoal (CAC), Espigão do Oeste (EOE), Pimenta Bueno (PBO) and Primavera de Rondônia (PRO).

	CAC	EOE	PBO	PRO
CAC	1	0,57	0,77	0,66
EOE	-	1	0,61	0,83
PBO	-	-	1	0,73
PRO	-	-	-	1

This high similarity between the municipalities is shown by the low diversity of species commercialized by fair dealers, as they are the easiest species to find and gather and still the most sought after by consumers. As we noted, marketers consider that they yield greatest financial return. Table 5 was proposed to check the degree of relevance of species used by families, the Importance Value Index (IVI).

Table 5: Importance Value Index (IVI) of the species found in open markets in the municipalities of the Rural Territory Rio Machado – RO, 2019.

Family/Species/Product	N	IVI
ARECACEAE		
<i>Bactris gasipaes</i> Kunth	1	0,02
<i>Attalea maripa</i> (Aubl.) Mart	1	0,02
<i>Euterpe oleracea</i> Mart.	10	0,24
<i>Scheelea phalerata</i> Mart. ex Spreng	1	0,02
BIXACEAE		
<i>Bixa orellana</i> L.	7	0,17
FABACEAE		
<i>Inga edulis</i> Mart.	2	0,05
<i>Hymenaea courbaril</i> L.	1	0,02
<i>Copaifera langsdorffii</i> Desf.	1	0,02
LECYTIDACEAE		
<i>Bertholletia excelsa</i> Bonpl	13	0,32
MALVACEAE		
<i>Theobroma grandiflorum</i> (Willd. ex Spreng.) K. Schum	11	0,27
<i>Theobroma cacao</i> L.	2	0,05
PRODUCT		
Honey	7	0,17

N: Observations.

Among the species with the highest importance value, Brazil nuts stand out; açai and cupuaçu bear values of 0.32 IVI, 0.27 IVI and 0.24 IVI respectively. This represents that these species are widely known by the population, since they are registered in other studies in the Amazon, corroborating the importance of them as suppliers of non-wood forest products in the region's economy (GONÇALVES et al., 2012; GUERRA et al., 2008; MARTINS et al., 2006; BIAVATTI et al., 2006; ALVINO et al., 2005).

In general, it is clear that in the Amazon biodiversity view the contribution of non-wood forest products to the region's economy is still modest. Besides, one of the alternatives to maintain the preservation of Amazonian forest ecosystems is to value the PFNMs (HOMMA, 2014). This can take place through the State efficiency in implement programs focused at socio-biodiversity product chains, study of the productive potential of species in order to ensure that they are effectively gathered in a sustainable manner, production technification, training of human resources, certification of products, more adequate logistical infrastructure, organization of social groups in cooperatives or associations, among others (OECD, 2002; MELO et al., 2010; KRAG et al., 2017).

CONCLUSIONS

The commercialization of non-wood forest products in the Rio Machado territory is predominantly carried out by women. Production is guaranteed through family labor, whereas it contributes poorly to the families' economy. Rates are low for the diversity of products and supplier species, but similar between open fairs analyzed in this study.

Even though modest by marketers, the commercialization of PFNM's is represented by few species and poor technification. Families do not receive any support from public entities and, as they report, PFNM's could become an important source of income for them and still contribute to the forests conservation in the region. This process will be possible with efficient performance of public policies, organization of groups in cooperatives or associations, training of labor, processing of products, certification and research in the area mainly focusing on species, their potential and products.

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