



Núcleo de Meio Ambiente
Universidade Federal do Pará
Rua Augusto Corrêa, 01, Guamá
Belém, Pará, Brasil

<https://periodicos.ufpa.br/index.php/agroecossistemas>

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CHARACTERIZATION OF THE PRODUCTION SYSTEMS OF SMALL PRODUCERS WITH THE MANAGEMENT OF BACURI TREES IN THE BRAZILIAN NORTHEASTERN MESOREGIONS OF PARÁ AND MARAJÓ

ABSTRACT: An analysis was conducted of the characteristics of the production systems of small producers who have been developing the management of bacuri trees (*Platonia insignis* Mart.) in the North-eastern region of the state of Pará and in Marajó. These mesoregions were selected based on information that they are productive areas that account for the largest supply of bacuri fruit in the state of Pará. In order to carry out the field survey, intentional sampling was decided upon, considering only small producers with bacuri trees in their establishments. A total of 77 questionnaires were applied among the 7 municipalities studied, 57 in the mesoregions of North-eastern Pará and 20 in Marajó. From an investigation of the socioeconomic survey conducted in the mesoregions of Northeastern Pará and Marajó, the most relevant data were analyzed to enable a profile to be generated of the farmers who manage the bacuri trees and who commercialize the bacuri fruit or its pulp in some form or another. It was also concluded that the management of bacuri trees constitutes a significant family strategy for maintaining families in the countryside, and that presents a growth potential, which is capable of meeting export demands, important for income generation.

KEYWORDS: Bacuri fruit, Socioeconomic survey, Export demand.

CARACTERIZAÇÃO DOS SISTEMAS DE PRODUÇÃO DOS PEQUENOS PRODUTORES COM MANEJO DE BACURIZEIROS NAS MESORREGIÕES NORDESTE PARAENSE E MARAJÓ

Received: 2022-01-20
Evaluated: 2022-05-09
Accepted: 2022-06-02

Agroecossistemas, v. 14, n. 1, p. 96 – 114, 2022, ISSN online 2318-0188
<http://dx.doi.org/10.18542/ragros.v14i1.11815>

RESUMO: Analisou as características dos sistemas de produção dos pequenos produtores que vem desenvolvendo o manejo do bacurizeiros no Nordeste Paraense e Marajó. A escolha das Mesorregiões do Nordeste Paraense e Marajó decorreu da informação de que são áreas produtoras que respondem pela maior oferta de frutos de bacuri (*Platonia insignis* Mart.) no estado do Pará. Para realização do levantamento de campo, optou-se por uma amostragem intencional, considerando-se somente os pequenos produtores que possuíam bacurizeiros nos seus estabelecimentos. Foram aplicados ao total 77 questionários entre os 7 municípios estudados, sendo 57 na Mesorregião Nordeste Paraense e 20 no Marajó. Verifica-se que a partir do levantamento socioeconômico realizado nas Mesorregiões do Nordeste Paraense e Marajó, foram analisados os dados de maior relevância que permitisse gerar o perfil dos agricultores que realizam o manejo de bacurizeiros e que realizam algum tipo de comercialização dos frutos ou da polpa de bacuri. Conclui-se ainda que o manejo de bacurizeiros constitui uma estratégia familiar importante para a manutenção das famílias no campo e apresenta potencial de crescimento capaz de atender demanda de exportação, importante para geração de renda.

PALAVRAS-CHAVE: Frutos de bacuri, Levantamento socioeconômico, Demanda de exportação.

CARACTERIZACIÓN DE LOS SISTEMAS PRODUCTIVOS DE PEQUEÑOS PRODUCTORES CON MANEJO DE BACURIZEIROS EN LAS MESOREGIONES NORESTE PARAENSE Y MARAJÓ

RESUMEN: Analizó las características de los sistemas de producción de pequeños productores que vienen desarrollando el manejo de los árboles de bacuri (*Platonia insignis* Mart.) en el Nordeste Paraense y Marajó. La elección de las Mesorregiones del Nordeste Paraense y Marajó resultó de la información de que son áreas productoras que representan la mayor oferta de frutos de bacuri en el estado de Pará. Para realizar el estudio de campo, se eligió un muestreo intencional, considerando solo pequeños productores que tenían árboles de bacurizeiros en sus establecimientos. Se aplicaron un total de 77 cuestionarios entre las 7 ciudades estudiadas, 57 en la Mesorregión del Nordeste Paraense y 20 en Marajó. Se verifica que a partir de la encuesta socioeconómica realizada en las Mesorregiones del Nordeste Paraense y Marajó, se analizaron los datos más relevantes que permitirán generar el perfil de los agricultores que manejan árboles de bacurizeiros y que realizan algún tipo de comercialización de los frutos o pulpa de bacuri. También se concluye que el manejo de los árboles de bacuri constituye una estrategia familiar importante para el mantenimiento de las familias en el campo y presenta un potencial de crecimiento capaz de satisfacer la demanda de exportación, importante para la generación de ingresos.

PALABRAS CLAVES: Frutas bacuri, Encuesta socioeconómica, Demanda de exportaciones.

INTRODUCTION

The bacuri tree (*Platonia insignis* Mart.) is found in the North-eastern region of the state of Pará and in Marajó region in two forms: either preserved by farmers as part of the shifting cultivation system in recently deforested areas, or maintained as fruit trees in their backyards and some productive orchards containing only this species (MEDINA; FERREIRA, 2004; FERREIRA, 2008). The fruit of the bacuri trees, the bacuri, holds a special place in the culture of Pará and has the potential to expand its market, although most of the production still comes from the extraction of plants by native populations.

In recent years, there has been a significant commercial increase for bacuri, and the local and regional markets still have room for growth and is also able to generate more formal and informal employment. As a result, many farmers, such as those in the

North-eastern region of the state of Pará and in Marajó region, have begun to realize that bacuri, which was previously used primarily for family consumption, may be included as a source of income for their families (MEDINA; FERREIRA, 2003; BOTELHO et al. al., 2020).

There are few academic studies on the bacuri tree, or research aimed at understanding the species and other non-timber forest products (NTFPs) as an integral part of the production system in the Amazon (MEDINA; FERREIRA, 2003). It is important to conduct fieldwork that seeks to bring together the knowledge of people who have been managing their areas with bacuri trees, and the importance that they have attributed to the fruit.

Bacuri is one of the few large Amazonian tree species that presents both sexual (seeds) and asexual (shoots from roots) reproduction (GUIMARÃES et al., 1992). Thus, in the old areas

where bacuri trees occur naturally, there is regrowth, in which, management, through arranging the plants at the appropriate spacing, would enable the formation of a homogeneous plantation, creating an alternative for the degraded areas in the states of Pará, Maranhão and Piauí. The density of bacuri trees in some areas when regeneration begins may reach 40 thousand plants/ha (HOMMA et al., 2018). A study carried out by Menezes 2010, observed in the area of a small family producer in the municipality of Maracanã, Pará, in an area of *capoeira* (secondary vegetation), at the beginning of bacuri tree management, that there was an occurrence of 15,000 bacuri plants/ha.

The abovementioned management consists of selecting the most vigorous shoots that grow spontaneously on the abandoned cultivated areas, with a spacing of 10m x 10m, whereby annual cultures may be implanted between the rows during the first years, to reduce the costs of implantation, in addition to also sowing perennial plants, thus

forming agroforestry systems (AFSs). According to Menezes et al. (2010; 2012), this system is developed in two ways: radical management, in which all other species are removed, leaving only the bacuri plants; and moderate management, in which other plant species of economic value are left, in addition to the bacuri tree.

In this study, a socioeconomic diagnosis is presented with 77 small producers who manage bacuri on their properties, with the application of questionnaires among the 7 municipalities studied, 57 in the mesoregion of Northeastern Pará and 20 in that of Marajó.

The research results analyze several effects on the economic agents involved in this activity. This information is important in order to guide the implementation of public policies in rural areas, and also to guide producers who would like to implement the management of bacuri trees in their areas.

In this context, in addition to the scarcity of economic information, there

are few studies on the technological aspects of the subsystems of bacuri management developed by the farmers themselves. Scientific research institutions have recently begun to realize the importance of bacuri tree management and the first attempts at domestication.

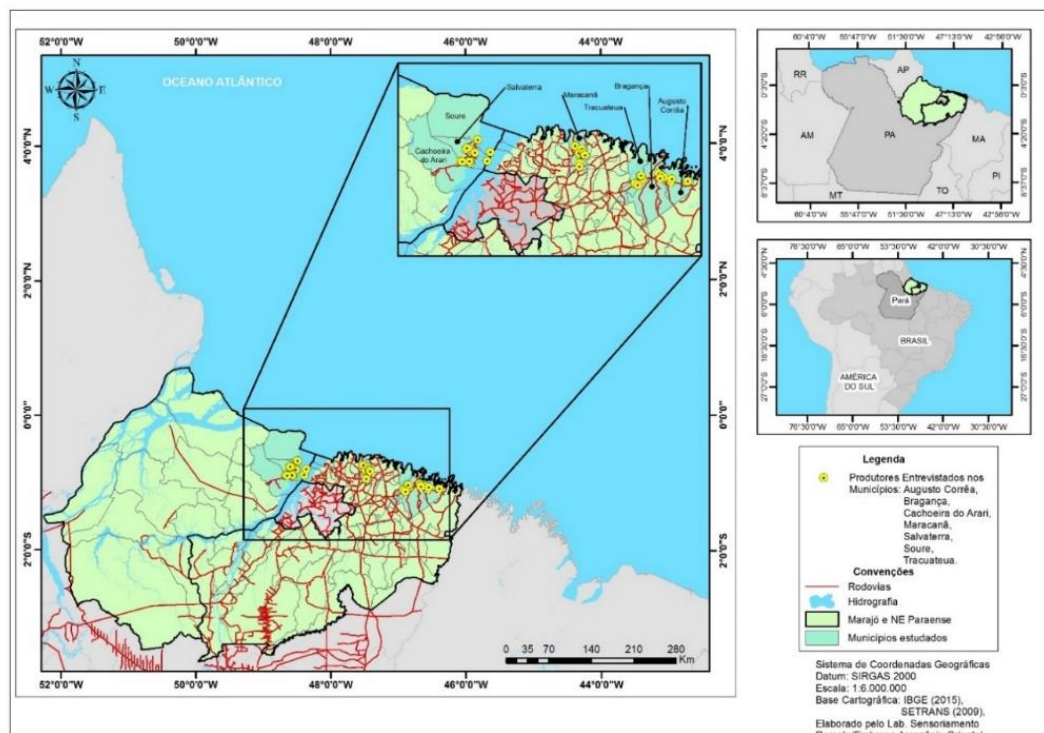
MATERIAL AND E METHODS

STUDY AREA

The choice of the mesoregions of

North-eastern Pará and Marajó as the study area resulted from current information that these are production areas that account for the largest supply of bacuri fruit trees. According to Cavalcante (2010), the area with the highest concentration of bacuri trees is in the micro-region of Salgado, in Marajó and in some municipalities in the micro-region of Bragançina (Figure 1).

Figure 1. The mesoregions of Northeastern Pará and Marajó with the location of the family establishments in the municipalities studied.



Source: Field survey (2017).

In North-eastern Pará, the research was conducted with families in the municipalities of Bragança, Tracuateua and Augusto Corrêa, belonging to the micro-region of Bragantina, and in the municipality of Maracanã, belonging to the micro-region of Salgado. In Marajó, they were carried out in the municipalities of Cachoeira do Arari, Salvaterra and Soure belonging to the micro-region of Arari (IBGE, 2022).

METHODOLOGICAL PROCEDURES

The methodological procedures were based on qualitative and quantitative approaches (SCHNEIDER, 2003). The quantitative approach was carried out in order to generalize the types of production system per municipality, and the qualitative approach to understand the motivations and transformations that occurred within the production system of the types found.

The research relied on both primary and secondary data. The secondary

data, which are those existing from different sources, served as support in order to understand the local economy of the municipalities studied. Primary data were obtained through questionnaires.

The field survey included the application of a questionnaire, since there are no previous studies at the level of establishment or of production systems that characterize the production of bacuri fruits in these municipalities. Because the data that quantify the production of bacuri are framed together with non-timber forest products (data from municipal agricultural production, produced by the IBGE¹), we sought to apply as many questionnaires as possible. A total of 77 questionnaires were applied among the 7 municipalities studied, 57 in the mesoregion of North-eastern Pará and 20 in Marajó (RODRIGUES, 2018).

Intentional sampling was chosen, considering only the small producers who had bacuri trees in their establishments and that conducted

¹ The Brazilian Institute of Geography and Statistic.

some type of commercialization of the products. According to Marconi and Lakatos (1996) intentional sample is the most common among those considered non-probabilistic and therefore does not allow generalizations of the results. However, it is valid, within a specific context, for supporting the interpretations of secondary data

seeking to characterize the bacuri tree management systems developed by small producers.

The questionnaire addressed general topics regarding the family and the establishment, and also focused on the management of bacuri trees (Figure 2) and the relationship with other agricultural activities.

Figure 2. Management of bacuri trees carried out by producers in the municipality of Maracanã, North-eastern Pará.



Source: Field survey (2017).

The following items were analyzed: identity of the informant (name, place of birth, profession, age); family composition (number of people, age, whether they work outside the property, what type of work); aspects of bacuri production (general information on the characteristics of the trees, fruit collection, type of fruit, processing the fruit pulp, marketing); land status of the property; property structure; land use (size of the forest

area, size of the cultivated area, etc.) and composition of family income.

RESULTS AND DISCUSSION

From the socioeconomic survey conducted in the mesoregions of North-eastern Pará and Marajó, the most relevant data were analyzed, which enabled a profile to be generated of farmers who manage bacuri trees and who commercialize the bacuri fruit or pulp in one way or another (Figure 3).

Figure 3. Bacuri fruit is collected only after they have fallen. There are variations in color, shape, pulp yield, acidity, among other attributes.



Source: Field survey (2017).

In addition, the production subsystems of the family establishments generated from the typology observed were also characterized, subdivided into 7 subsystems (bacuri production subsystem, cassava production subsystem, pineapple production subsystem, fruit tree production subsystem, annual crop and vegetable production subsystem, animal and plant extractivism subsystem and small animal husbandry subsystem) practiced by families in the mesoregions of North-eastern Pará and Marajó (RODRIGUES, 2018).

CHARACTERIZATION OF THE FAMILIES INTERVIEWED

Of the total number of interviews conducted, it was observed that approximately 98% of respondents from the mesoregions of North-eastern Pará and 95% of Marajó were born in the state of Pará. Among those interviewed, 65% were male and 35% were female.

The ages of the people interviewed were more concentrated in the age group between 31 and 50 years old, with 37% in North-eastern Pará and 50% in Marajó. It was observed that the families in the vast majority of establishments consisted of up to 4 family members. According to Schneider (2003), family rationality seeks an optimization in the use of land, capital and labor force, established from the size of the family and its degree of exploitation in relation to the objective conditions of the means of production. The composition and link between the domestic (consumption) unit and the production unit is what makes the family work as a whole, especially with regard to income management.

In terms of education among the families, it was observed that in the age group from 6 to 15 years, all family members attended school, both in the mesoregions of North-eastern Pará and Marajó. In the age group of 16 to 25 years, this average increased to 43% and 40%

respectively. People over 55 years of age interviewed have no access to schools in the municipalities studied.

Among the main reasons for the low level of education, the producers highlighted the need to start working in agricultural activities, given the low availability of labor within the families, in addition to access to schools, which are usually located far away. Among those aged 55 years and over, the reasons given were lack of interest and the huge distance from schools. One important fact is that all the families that had children and adolescents up to 16 years old had access to the Bolsa Família² resource, and this factor was evidenced as a stimulus for parents to keep their children attending school regularly.

The data collected demonstrated that most of the houses were constructed of masonry in the two mesoregions studied. In a survey carried out by Menezes (2010), the

predominant dwellings were made of taipa [wattle and daub]³, which indicates an improvement in living conditions among families who manage bacuri trees, since at least 10% of the people interviewed in the two mesoregions say they use the value generated in the bacuri harvest to invest in the purchase of construction materials and in the construction of their homes. According to the research data, wattle and daub houses in the municipalities studied represent only 5% of the interviews, and wooden houses represent 14% in the mesoregions of North-eastern Pará and 10% in Marajó.

In relation to the source of water for domestic use, it was observed that most families have artesian wells in both mesoregions of North-eastern Pará and Marajó. In a previous survey carried out by Menezes (2010) with bacuri-producing families, the vast

² A conditional cash transfer program (CCT) focused on health and education.

³ Wattle and daub (*taipa*) is a technique in which the walls are reinforced with wood or bamboo and filled with mud and fiber.

majority had Amazonian wells as their main source of water. One important data that was raised is the water supply system carried out in the communities of Marajó. In these communities there was already piped water without the payment of a fee, representing 40% of the families interviewed, and with the payment of fees ranging from R\$6.00 to R\$15.00, representing 15%.

With regard to the size of the properties, it was observed that the areas of 26% of the families interviewed in North-eastern Pará range between 1 and 10 ha, 26% range between 21 and 50 ha, and 11% with areas smaller than 1 ha. Sixteen percent of the families interviewed were unable to inform the size of their properties. In Marajó, on the other hand, most of the interviewed families (30%) owned areas smaller than 1 ha, 25% had areas with up to 10 ha and 10% were unable to inform the size. The properties of most of the families who were unable to inform the size had acquired these areas through

inheritance and, due to the division with other relatives, they did not know for sure the size of the plots of land.

In the mesoregion of North-eastern Pará it was noted that 51% of respondents acquired their properties through inheritance and 35% through purchase, and in Marajó these were 60% and 30% respectively. For Carneiro (2001), patrimonial succession is a process of essential importance for family farming, since it constitutes a transfer of responsibilities, the security of social reproduction, stretching beyond the simple transfer of land.

An effort was made to observe the comfort and well-being of farmers who have been practicing the management of bacuri tree and the main durable goods available in family establishments. It was observed that a television is available in most properties in the two mesoregions and is the main source of information among the families. In Marajó, it was observed that 50% of the families owned a motorcycle as a means of

transport. A gas stove and refrigerator are already found in most establishments in both the studied mesoregions. One item that used to be infrequent among families and which is now present for 65% of those interviewed in Marajó, is the freezer. The presence of several durable goods in the surveyed families demonstrates an improvement in life that may be attributed to the valorization of the bacuri fruit and the commercialization of pulp, as a study carried out by Menezes (2010) had illustrated another reality for these bacuri-producing families.

Of the total of 77 families interviewed, 52, or 67.5%, registered an interest in participating in courses and training on bacuri trees. Among the families who said they were not interested in participating; the main reasons were lack of time, not being literate or because they had participated in previous training offered by ICMBio, Embrapa Amazônia Oriental and Emater - Pará.

Among the training needs mentioned by the families, the most representative was on the management of bacuri tree, equivalent to 26% in the mesoregion of North-eastern Pará and 29% in Marajó. Families from Marajó were more concerned about increased production (which is also related to the production of bacuri trees in less time) compared to families from North-eastern Pará, representing 29% of the interviews.

COMPOSITION OF THE PRODUCTION SYSTEM OF THE STUDIED FAMILY ESTABLISHMENTS

The production system of the families that manage bacuri trees in the mesoregions of North-eastern Pará and Marajó is composed of the following subsystems: bacuri production subsystem, cassava production subsystem, pineapple production subsystem, fruit tree production subsystem, annual crop and vegetables production subsystem, animal and plant

extractivism subsystem and small animal husbandry subsystem.

It was noted that the different practices carried out by the interviewed families have been influenced by the market, since they are intensifying and increasing their areas with bacuri tree management.

It is possible to state that the management of bacuri trees is a very old practice carried out by these families since it is possible to come across several trees managed near the homes of those who are aged 50 years and over. There has been a technical recommendation for cultivation since the 1970s (CALZAVARA, 1970), but there are still no commercial crops.

From around the 2000s onwards, with the rise in bacuri consumption, there was an increase in the managed areas and the interest of research institutions. As of 2006, Embrapa Amazônia Oriental held several courses with farmers in order to rationalize the management that they practiced and to optimize production.

One of the main technical recommendations for management is the adoption of spacing between the most vigorous plants, recommended as 10m x 10m between plants managed in secondary vegetation. However, families often leave the plants closer to one another (MAUÉS; VENTURIERI, 1996).

Below is a description of the subsystems adopted by small producers who practice extractivism and management of bacuri trees on their properties.

CASSAVA PRODUCTION SUBSYSTEM

Of the total of 77 families, 63 cultivated cassava, representing 81.8% of the interviews. Families cultivate cassava to produce flour and also to sell the roots. When necessary, families sell the flour, with prices ranging from R\$3.50 to R\$5.00 per kilo sold directly from the plot of land, or from R\$180.00 to R\$350.00 per 60kg bag, varying between direct sale from the plot of land or at the market. The monthly production for

consumption among families in Marajó ranged from 30 to 200 kg and in North-eastern Pará from 30 to 150 kg. For commercialization, the average production was up to 25 bags of 60 kg per month.

This crop occupies areas of up to 2 ha and is usually intercropped with food crops such as rice, beans and primarily maize. The workforce for this activity is predominantly family, with people being hired or days being exchanged during the period when the roots are being dug up. Another form of production found in this subsystem is the "half flour", where one family provides the area to be cultivated and the other provides the labor. At the end, the production is divided equally between the 2 parties.

PINEAPPLE PRODUCTION SUBSYSTEM

This subsystem is exclusively aimed at commercialization and was only found in Marajó. According to Homma et al (2006), the areas where pineapple plantations occur present a vegetation typical of the Marajó fields

or secondary vegetation in the old areas where bacuri trees used to occur. This part of the destruction of bacuri trees is related to the expansion of pineapple plantations.

Spacing varies among producers, but the most commonly used spacing ranges from between 1m to 1.20m between rows and 20cm to 30cm between plants. The number of furrows varies from 28,000 to 33,000, with 30,000 being the most common.

This subsystem demands a greater hiring of labor, mainly during the harvesting period. The sale value of pineapples practiced by farmers is R\$1.00 per unit, and most families reported receiving between R\$3,000.00 to R\$10,000.00, i.e., the sale of 3,000 to 10,000 pineapple units, during the period from May to December (Field study, 2017).

SUBSYSTEM PRODUCTION OF FRUIT TREES

This subsystem is present in all the families interviewed, forming small agroforestry backyards. Among these,

there are some families that sell some products, such as açaí, passion fruit and cupuaçu, with açaí being sold in natura and passion fruit and cupuaçu sold both in natura and pulp. The value practiced among families in the municipalities studied for 1 kilo of passion fruit pulp is R\$8.00 and cupuaçu pulp is R\$10.00 sold directly from the plot of land or through orders (Field study, 2017). The other fruit trees are for family consumption and to provide shade and landscaping for the establishments.

The fruit trees found in the establishments are: avocado (*Persea americana* Mill), açaí (*Euterpe oleracea* Mart.), Barbados cherry (*Malpighia emarginata* DC.), bananeira (*Musa* spp), coconut (*Cocos nucifera* L.), gravioleira (*Annona muricata* L.), cupuaçuzeiro (*Theobroma grandiflorum* (Willd. ex Spreng.) K. Schum.), murucizeiro (*Byrsonima crassifolia* (L.) Kunth), mangabeira (*Hancornia speciosa* Gomes), mango (*Mangifera indica* L.), passion fruit (*Passiflora edulis* Sims),

orange (*Citrus sinensis* (L.) Osbeck), peach palm (*Bactris gasipaes* Kunth), lemon (*Citrus limon* (L.) Osbeck), cashew (*Anacardium occidentale* L.), jackfruit (*Artocarpus heterophyllus* Lam.), jameiro (*Syzygium jambos* (L.) Alston), jenipapapeiro (*Genipa americana* L.), taperebazeiro (*Spondias mombin* L.), tangerine (*Citrus reticulada* Blanco), papaya (*Carica* sp) and guava (*Psidium guajava* L.).

ANNUAL CROPS AND VEGETABLES SUBSYSTEM

In North-eastern Pará, only 10% of the interviewed families grew vegetables, where most are only for family consumption. In Marajó, 20% of the interviewed families grow vegetables and of this total, all the families commercialized their vegetables. The main product sold is parsley (*Petroselinum crispum* (Mill.) Fuss) with prices ranging from R\$0.50 to R\$2.00 per pack, which is sold directly from the plot of land or at the nearest markets (Field study, 2017).

In the two mesoregions, among the families interviewed, the main vegetables cultivated are watermelon (*Citrullus lanatus* (Thunb.) Matsum. & Nakai), maroon cucumber (*Cucumis anguria* L.) and pumpkin (*Cucurbita* spp.). These crops are only for family consumption.

Among the annual crops, in Marajó, the interviewed families only cultivated maize (*Zea mays* L.) to feed the chickens on the plot of land and in North-eastern Pará, in addition to maize, they also cultivate black-eyed beans (*Vigna unguiculata* (L.) Walp), but only for family consumption.

ANIMAL AND PLANT EXTRACTIVISM SUBSYSTEM

Fishing was identified for both family consumption and commercialization. The prices varied from R\$ 0.30 to R\$ 6.00 per kilo, depending on the species. The average monthly consumption ranged from 20 to 50 kg of fish per interviewed family (Field survey, 2017).

Families that are registered for artisanal fishing receive the closed season benefits in 4 instalments of R\$ 937.00 from January to April, carrying out free fishing from May to December.

Crab extractivism was identified as being predominantly for self-consumption among the interviewed families. Few families conducted extractivism for commercialization purposes, but among those who did the unit price ranged from R\$1.00 to R\$2.50 and from R\$30.00 to R\$60.00 per kilo of pulp (Field study, 2017). It has been reported that one person is able to catch up to 70 crabs in one morning, depending on tidal conditions.

Among some families, the activity of vegetal extraction was found with the collection of tucumã palm oil (*Astrocaryum vulgare* Mart.), which is extracted from the maceration of larvae contained within them. Plant extractivism from tucumã collection was found only in the Marajó region,

representing 25% of the interviewed families.

Tucumã oil is a product from the Amazon rainforest, extracted from the larva of an insect belonging to the Coleoptera, Bruchidae family: *Speciomerus ruficornis* (HOMMA, 2014; PEREIRA, 2021), which develops inside the tucumã seeds and is collected by the extractive populations of Marajó, serving as food, medicine and a source of income.

This oil is used by families as a hair straightener, as a remedy for inflammation and is used in food. The price of a liter ranged from R\$ 30.00 to R\$ 100.00 among the interviewees, most of whom only extract the oil for consumption or to fulfill orders, due to the difficulty in preparation. According to the families, approximately 3,000 stones with larvae are needed to produce 1 liter of oil (Field study, 2017).

The fruit is sold to a local cooperative at values ranging from R\$0.25 to R\$0.40 per kg, 500 kg being

sold at a time as the cooperative comes to pick it up from the plot of land, which it transfers to Beraca for processing.

SMALL ANIMAL HUSBANDRY SUBSYSTEM

Chickens are raised by the majority of the domestic units, involving 69 of the 77 families. The chickens run freely around the houses, scavenging the land and basically feed on leftover food and maize produced on the plot, and are taken care of by the women.

The average was between 10 and 30 birds per family interviewed in the two mesoregions and this activity is to meet the family's consumption, with eventual commercialization. In North-eastern Pará, 35% of the families interviewed conduct commercialization and in Marajó, 30%. The sale price ranged from R\$20.00 to R\$25.00 in Marajó and from R\$25.00 to 35.00 in North-eastern Pará, and eggs sold at R\$0.50 per unit (Field survey, 2017).

The raising of pigs was reported by only 20.78% of the interviews, i.e., only 16 families had these animals. The number of pigs in the establishments ranged from 1 to 30 animals. Commercialization is carried out both with live animals and by the weight of meat. The price ranged from R\$5.00 to R\$10.00 per kilo of meat and R\$3.50 per kilo of live animal in Marajó. In North-eastern Pará, the price ranged from R\$ 6.00 to R\$ 7.00 per live animal and R\$ 15.00 per kilo of meat. It was also found that 2-month-old piglets were sold at R\$100.00 per animal (Field study, 2017).

CONCLUSION

The results of the research have enabled the elaboration of a typology of 7 production subsystems (bacuri production subsystem, cassava production subsystem, pineapple production subsystem, fruit tree production subsystem, annual crops and vegetables production subsystem, animal and plant

extractivism subsystem and subsystem raising small animals) practiced by families in the mesoregions of North-eastern Pará and Marajó.

Among the motivations for the management of bacuri trees, there was a strong market influence, where during the harvesting period, bacuri becomes the main product sold by families. Among the families that had older managed areas, it was noted that the cultural issue of landscape composition of the backyard was the motivating factor.

It is imperative that new research be carried out in the context of family farming in order to quantify the production of bacuri, so that there is a social and environmental valorization of this species, which has a productive potential capable of generating employment and income, contributing to regional development. Another aspect would be to draw attention to researchers in the development of technologies aimed at the use of bacuri shells and

seeds, the integration of bacuri trees into agroforestry systems and the need to develop a pulping machine to ensure better quality for this product.

The management of bacuri trees is, therefore, an important family strategy for the maintaining families in the countryside and presents growth potential capable of meeting export demands, important for generating local and regional employment.

ACKNOWLEDGEMENTS

We extend our thanks to the Amazon Fund to Support Studies and Research in the State of Pará (FAPESPA) for the financial support granted, EMATER-PA for supporting the access logistics for small producers, and Embrapa Amazônia Oriental for helping with technical information and field surveys.

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