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CONFIGURATION OF INTEGRATION RELATIONS BETWEEN COOPERATIVES AND EXTRACTIVE FAMILY FARMERS IN THE STATE OF PARÁ

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ABSTRACT

The objective of this article is to analyze the stages of tucumã production in relation to the added value and the resources mobilized in each of the cooperatives in the state of Pará that work with tucumã (Astrocaryum Vulgare Mart.) and that trade with the large company in the market, through the work of the small rural producer. They are: CAMTAUÁ; COOPIRITUIA; COFRUTA; COOMAC AND COPASMIG. A very important factor raised is the possibility of interaction and sharing of information between them, which aims to promote social inclusion and compliance with SDGs 1, 2, 12, 13, 15, 16 and 17, whose integration of their actions can provide the eradication of poverty in all its forms. The research answers the following problem: at what stage of the tucumã production and value creation chain are the cooperatives surveyed? It also aims to identify the strategies developed to propose integrative methodologies and information sharing for the inclusion of new formulations in the value creation process. The theoretical framework includes the Relational View Theory (RV) and the Resource-Based Theory (TBR) to support the analysis. It also took into account the roles of cooperation under the theme of cooperatives in the context of value creation The methodological approach is a case study, with a qualitative, descriptive and explanatory approach. As conclusions, the analysis of the stages of each cooperative representing all stages and processes of tucumã production

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until commercialization with the final consumer is highlighted. Highlighting their relationships along the value chain. The application of VR theory in this context demonstrated how value creation can be maximized through cooperation and valuing the relationships between the various actors involved. By sharing knowledge and valuing historical-cultural heritage, these cooperatives would not only promote environmental sustainability but also ensure economic viability and social development.

Keywords: Extractive Cooperatives. Sustainable Development Goals (SDGs). Value Creation. Relational View.

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INTRODUCTION

Academic interest in the strategic management of extractive product chains has expanded in recent years (Bijman; Wijers, 2019), in which the analysis of production processes, markets, marketing, product quality and the preservation of the environment are prominent themes. According to Homma (2018), Allegretti (1992) and Freitas et al. (2018), the exploitation of extractive base products in forest areas has contributed to development in border regions such as the Amazon, with emphasis on production processes of collection and processing of fruits, seeds and oils, apparently. However, the activities associated with farmers and extractivists are associated with deforestation of the Amazon rainforest, given that the extractive economy does not meet the consumption and well-being needs of the traditional populations of these frontiers (Santana et al., 2024).

The preservation of the forest is essential to maintain the quality of life on the planet and the Environmental Services (ES) provided by the forest are diverse, including climate regulation, protection of soil and water resources, biodiversity and oxygen production. In this sense, it is understood that the maintenance of forest areas is one of the strategies to make the transition to an environmentally sustainable future. However, the exploitation of extractive products such as wood, nuts, oilseeds, and minerals can have a negative impact on the forest and its ecosystems.

However, some facts point to the challenge of this transition, such as: deforestation in the Brazilian Amazon increased by 17% in 2020, reaching an area of 11,088 km²; Pará is the state with the highest deforestation rate in the region, representing 46% of the total deforested in 2020, with 5,067 km².

In the context of the transition, businesses in the Amazon are expected to promote sustainable development with social inclusion, in accordance with the sustainable development goals (SDGs) 1; 2; 12, 13, 15, 16 and 17, whose horizontal and vertical integration of their actions aim to eradicate poverty in all its forms and everywhere by 2030; ending hunger, achieving food security and improved nutrition, and promoting sustainable agriculture; Promote peaceful and inclusive societies for sustainable development, providing access to justice for all and building effective, accountable and inclusive institutions at all levels; Strengthen the means of implementation and revitalize the global partnership for sustainable development (United Nations, 2015).

The objectives of SDGs 1, 2, 12, 13, 15, 16 and 17 are within the idea of vertical and horizontal integration of the countryside and, therefore, combine cooperatives and agro-

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industries. In other words, the scope for economic development is in Davis and Goldberg's (1957) seminal concept of agribusiness when it describes three distinct but interdependent sectors in a global food system. Such systems include suppliers of agricultural inputs, producers of agricultural commodities and institutions that perform the functional aspects associated with the commercialization of food and fibrous products. Therefore, it is understood that the fundamental thing for the concept of agribusiness is that many problems related to agriculture are interrelated and depend on political, sociological, economic and behavioral factors.

The extraction or collection of socio-biodiversity products, including Tucumã, is carried out by extractivists or small producers who collect the fruit to sell to cooperatives or in local markets (Souza, 2020), which characterizes trade in short chains. The importance of extractive products for the development of territories with extensive areas of forest and rural populations involved in this production process was referenced in the studies by Homma (2018). However, when markets become more commercial and professional, smallholders are often excluded from the process as they are not able to provide consistent production (quantity, delivery time, and quality) and use modern cultivation techniques, which makes it difficult to access business services required by these markets (Adebayo et al., 2010). They often need to be part of cooperatives and/or associations.

In Pará, the fruit of Tucumã was used only to feed animals, unlike what happens in the state of Amazonas, where the consumption of tucumã by local residents is widespread. Currently, the scenario is different, after an agribusiness realized the potential of the bioactive compounds present in the removal of butter and tucumã oil for the production of biocosmetics (De Souza et al., 2022). However, this change would not be possible without the support of cooperativism, organized around family farming.

According to the study by Souza et al. (2022), the sustainable exploitation of tucumã in the state of Pará can generate income for local communities, as long as actions aimed at social inclusion and improving the working conditions of extractivists are practiced. The authors highlight the importance of adopting practices that promote environmental sustainability and the appreciation of local culture, in addition to establishing relationships of trust and partnership between the different actors involved in the production chain. In practice, this means that companies must seek to create value for all actors in the production chain, including extractivists and local communities without harming the environment.

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The cooperatives that are part of the Tucumã value chain in the state of Pará and mapped in this research are located in the municipalities of Irituia, Abaetetuba, Santo Antônio do Tauá, São Miguel do Guamá and Augusto Correa, which develop at least one of the stages: from collection and sale of *the product in natura* to the extraction of oil and butter, marketed in local markets, restaurants, ice cream parlors, oil extraction companies and regional and national cosmetics companies.

The tucum stems in the Amazon, in addition to the economic benefits (income generation), food production, and improved quality of life, also produce environmental quality and conservation of the natural resources of the Amazonian flora and fauna, producing various ecosystem services such as: maintenance of biodiversity, water quality, recovery of degraded areas, thermal comfort, maintenance of soil fertility and improvement of its quality, protection of biodiversity, the prevention of natural disasters and the improvement of public health, climate resilience, carbon sequestration, among others.

Thus, it can be said that the sociobiodiversity of the Amazon is an invaluable heritage, both in terms of biodiversity and cultural diversity. Within this context, extractive activities play a crucial role, especially when it comes to smallholder farmers organized in extractive cooperatives. An example of this is the extraction of tucumã, an activity that can be analyzed from the perspective of the Sustainable Development Goals (SDGs), particularly SDGs 1, 2, 12, 13, 15, 16 and 17. However, the "fair" prices paid by the companies that demand tucumã and other socio-biodiversity products do not adequately remunerate social services or environmental services, which corroborates the continued accumulation of environmental liabilities and predatory disruption of the forest ecosystems that shelter these products (Santana, 2020; Krag et al., 2017; Nogueira et al., 2024).

The research answers the following problem: at what stage of the tucumã production and value creation chain are the cooperatives surveyed? The general objective is to analyze the stages of production of tucumã in relation to the added value and the resources mobilized in each of the cooperatives. More specifically, to identify the strategies developed by the beneficiaries/buyers of Tucumã for the acquisition, commercialized product, logistics, storage and commercialization.

The article is structured in five sections, including this introduction and the conclusion. The theoretical aspects are presented and discussed in the second section. The methodology of the research is described in the third section. In the fourth section, the

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diagnostic results of the study are presented and analyzed in the light of the theoretical framework.

THEORETICAL FRAMEWORK

THE ROLE OF COOPERATIVES

The formation of cooperatives can be an efficient strategy to add value to the shared value chain and improve the living conditions of these communities. Cooperatives allow producers to organize themselves, negotiate fairer prices, and have access to resources, technologies, and information relevant to the production and marketing of extractive products. This strengthens the local economy and values natural resources, while contributing to the preservation of the region's culture and environment. Thus, for partner companies that buy these inputs, these products can represent an opportunity to obtain high-quality raw materials with unique characteristics, which can be used in their production processes. In addition, the purchase of these products can help promote the local economy and support the communities that operate them, as in the case of Tucumã.

The producers' cooperatives designed by the agribusiness segments are important to strengthen coordination because the improvement of the price level when small rural producers participate in the cooperative. In addition to access to new production techniques and increased commercialization. Cooperatives also have a positive impact on the technical efficiency of small producers and are effective in providing support services via extension technicians. (Bernard et al., 2008; Chagwiza et al., 2016; Abate et al., 2014).

However, the acceptance of extractive products that do not have market value, such as Tucumã, can have positive and negative points for producing communities and for the sustainable development of the region. On the one hand, the guarantee of these resources can be a source of income for local communities, allowing them to diversify their incentivized activities and become more independent. In addition, the generation of natural resources can contribute to the preservation of local culture and the traditional knowledge associated with these resources.

On the other hand, the supply of extractive products with no market value can lead to the exploitation of producing communities, which are often forced to sell their products at prices far below the real value. This can lead to a devaluation of the region's natural and cultural resources, as well as create socioeconomic inequalities in the shared value chain.

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Therefore, the amount paid to producers and/or cooperatives or associations can be so low that it is difficult to incorporate environmental costs into its valuation.

Therefore, it is stated that public institutions use cooperatives to implement poverty reduction programs and projects, based on the inclusion of cooperative members in production processes and to channel government benefits to specific groups that are in vulnerable conditions with regard to access to food. (Bijman; Wijers, 2019).

THE RELATIONAL VIEW (VR) IN THE CONTEXT OF COOPERATIVES

According to Duschek (2004), the Relational View (VR) is based on the Resource-Based View (RBV), but also considers some elements of the Transaction Cost Theory (TCT). However, although it adds some values to these approaches, it also criticizes them, aiming to overcome them with regard to the forms of resource management and obtaining competitive advantages. The Relational Vision, therefore, is a concept based on the perspective of integrating strategies between companies that enables the development of idiosyncratic connections.

From *integrated relationships* , organizations would allow themselves to collaborate, exchange experiences and knowledge, enabling the creation of joint and unique resources and capabilities (Dyer & Singh, 1998; Lavie, 2006). Thus, the Relational View (VR) deals with the generation of resources and capabilities arising from idiosyncratic links between companies belonging to a value chain (Dushek, 2004; Dyer & Singh, 1998). According to the concept, by sharing information and capabilities, and based on the frequency of transactions of specific assets, firms would go through a stage of reciprocity and transparency, in which new knowledge would be generated (Horvath, 2001; Zacharia et al., 2011).

The level of resource interdependence in alliances determines how quickly alliances can reach their value-creating potential and how quickly they are likely to dissolve. Viewed dynamically, the factors that often lead to the creation of greater value – such as informal trust, repeat ties, personalized assets – can also lead to decreased alliance performance.

Over the past 20 years, much research has examined cooperation for value creation (Kale, Dyer, & Singh, 2002; Lavie, Haunschild, & Khanna, 2012; Mesquita et al., 2008; Yli-Renko, Sapienza, & Hay, 2001; Zollo, Reuer, & Singh, 2002) and competition for value capture in alliances (Dyer, Singh, & Kale, 2008; Lavie, 2007). The Authors then define value creation as the value created in an alliance (dyad/network) that is above and beyond

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the value created in competing market relationships. However, this theoretical argument, like the certifying companies of family farming and socio-biodiversity products, according to studies by Iddrisu et al. (2020), Ferreira & Santana (2017), Nogueira & Santana (2024), the "premium prices", or "fair prices", do not cover the costs of product differentiation, which the results cannot change people's quality of life.

Thus, while some studies have shown a positive impact of repeated ties on alliance performance (Gulati, Lavie, & Singh, 2009; Zollo, Reuer, & Singh, 2002), other studies have found a negative relationship between repeated ties and alliance performance (Goerzen, 2007; Sampson, 2005). In fact, repeated ties can lead to increased competition among alliance partners for value capture as partner companies' resources converge and become redundant.

The theory of the Relational View highlights two important issues to make relationships achieve the expected success. The first issue is related to collaboration, especially when there are routines of knowledge exchange. To this end, companies should develop conditions of absorptive capabilities that allow them to identify the value of external resources, assimilate them and combine them with their internal resources.

Over time, authors began to connect the Relational View and the Resource-Based View with environmental practices along supply chains, with regard to the possibilities of creating resources and capacities that generate competitive advantages (Bowen et al., 2001; Carter & Carter, 1998; Förstl et al., 2010; Gavronski et al., 2011; Vachon & Klassen, 2006).

The theory of relational value, when applied to the context of extractive cooperatives, could contribute significantly to promoting sustainability in its three dimensions: environmental, economic and social.

- Environmental Sustainability: Through cooperation and knowledge sharing on sustainable practices, cooperatives can ensure the preservation of natural resources. The sustainable management of products such as tucumã and açaí helps maintain the integrity of Amazonian ecosystems.
- Economic Sustainability: Cooperation allows smallholders to achieve economies of scale, improve the quality of their products, and access wider markets. This results in increased financial stability and income for local communities.
- Social Sustainability: The integration of knowledge and the appreciation of local culture strengthen social cohesion and empower communities. Cooperatives

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function as support networks that promote social justice and equity. (Silva, Santos & Gomes, 2023).

However, the experiences in use in the integrations between cooperatives and large companies demanding the products, as revealed in field research with the cooperatives under study, the prices paid to the cooperatives do not cover the social and environmental costs, a fact that is leading many cooperative members to stop participating in the cooperatives and those who continue reveal low motivation or dissatisfaction with the low possibility of success in price negotiations, especially because the supply of socio-biodiversity products such as tucumã is much higher than the demand for the product (Santana & Gomes, 2024a,b).

In Barney's view (1991, p. 101), firms' resources "include all assets, capabilities, organizational processes, attributes, information and knowledge controlled by them". These resources are classified into three groups: i) physical capital resources: technologies, equipment, geographic location, and access to raw materials; ii) human capital resources: experience, critical positioning, intelligence, relationship and *insights* of managers and employees of the firm; and iii) organizational capital resources: formal communication structure, formal and informal planning, control, coordination of systems, as well as informal relationships between groups within the firm and with its external environment. Also according to the author, the basic conditions for achieving advantages are: valuability, "rarability", heterogeneity, imperfect imitability and for having a differentiated organizational structure (Barney, 1991; Barney & Hesterly, 2007). Here it is worth revealing that in no cooperative this set of resources has been identified and the little that the costs of depreciation and maintenance of physical capital, social capital and human capital operate are not being included in the cash flow of the cooperatives or in the productive systems of the cooperatives, a fact that frustrates the possibility of creating competitive advantages (Santana & Gomes, 2024a,b).

Gold et al. (2010) argue that the Relational View would better explain the process of creating competitive (and sometimes collaborative) advantages from the generation of interorganizational resources and capacities that would be particularly difficult for competitors to replicate. Other essential factors in collaboration would be to develop relationships based on transparency and reciprocity, allowing firms to share information and *know-how.* The other important issue is related to governance. According to Dyer and Singh (1998), companies need guarantees to support their transactions.

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Thus, it can be said that the theory of relational value emphasizes the importance of interactions and relationships between the various actors involved in a productive process for the creation of value. This vision is particularly relevant to the context of extractive cooperatives in the Amazon, where cooperation, the integration of knowledge and the appreciation of historical-cultural heritage are essential to promote environmental, economic and social sustainability. That is, these relationships are built on trust, reciprocity and shared commitment, and are fundamental for capacity development and innovation. In the context of extractive cooperatives, this theory can be applied to understand how cooperation between producers, communities, businesses, governments, and NGOs can generate value in multifaceted ways. However, in the reality of cooperatives, these relationships are fragile, or hidden, as there was no entrepreneurial vision on the part of cooperative managers regarding the knowledge of these relational forces to integrate decisions during negotiations and strengthen the links in the value chain (Santana & Gomes, 2024a,b).

Finally, concerns related to the reduction of socio-environmental impacts began to be seen as determinants of competitive gains. (Carter & Rogers, 2008; Porter & Kramer, 2006).

METHODOLOGY

PROCEDURES AND METHODS

The method used to carry out the research was the case study to include the qualitative approaches, descriptive of information obtained from interviews with the management of the cooperatives and some of the cooperative members in individual and collective interviews, on the occasion of meetings to dialogue about the relations between the cooperatives and the cooperative members and the customers**.** The main cooperatives in the state of Pará, involved in the extractivism, processing and commercialization of Tucumã and its by-products, were studied. They are: Production Cooperative of Family Farmers of São Miguel do Guamá – COOPASMIG; Mixed Cooperative of Family Farmers and Extractivists of Caetés – COOMAC, Cooperative of Fruit Growers of Abaetetuba – COFRUTA, Cooperative of Production of Family Farmers of the municipality of São Miguel do Guamá CAMTAUÁ and Agricultural Cooperative of Family Producers of Irituienses D'Irituia – COOPIRITUIA, with 50 to 80 registered cooperative members on average,

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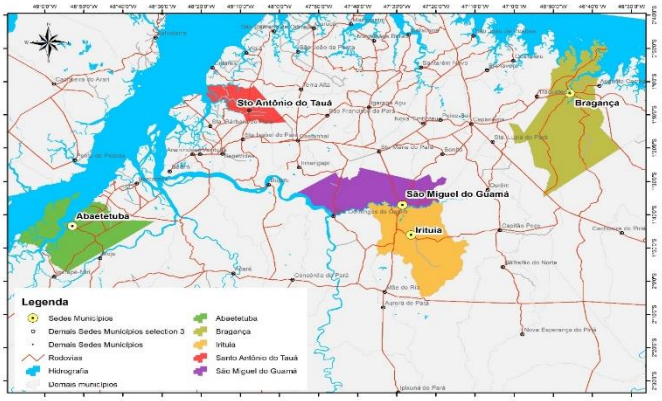
between men and women. Such cooperatives are represented in the following Georeferencing :

Figure 1: Research Area of the municipalities that have cooperatives or associations that commercialize Tucumã in the State of Pará through Extractivism (Augusto Corrêa (Bragança), Irituia, Abaetetuba, Santo Antônio do Tauá and São Miguel do Guamá).



Source: Author's Elaboration, 2023

Access to some of these cooperatives was intermediated by the Organization of Brazilian Cooperatives (OCB/PA) and the others directly by the researcher with the support of the university via letters of interest in partnerships and cooperation.

This research is considered descriptive and explanatory because its purpose is to describe and explain how the stages of production and processing of Tucumã *in natura occur* after the receipt by the cooperatives of the fruit from the small rural producer. As well as describing the current stages/stages of production and commercialization of each cooperative, that is, the resources and capacities of each cooperative. Therefore, the methodological approach is qualitative, theoretical, descriptive and explanatory, using conceptual analysis and on-site technical visits to carry out a theoretical-empirical research.

Structured technical visits were carried out in the highlighted cooperatives to collect information and map production processes through open and closed questionnaires. Regarding *on-site* visitation, the sample was composed of cooperative members, small rural producers in the community and cooperatives, intentionally chosen. In addition to the questionnaire, consisting of a block with sociodemographic information and another block with aspects related to production and productivity, quality, environment, benefits of tucumã and the relationship of small rural producers, an in-depth interview was also carried out with the cooperative, in person and semi-face-to-face, to obtain information about all production processes. processing and commercialization.

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CHARACTERISTICS OF THE PRODUCT TUCUMÃ (*ASTROCARYUM VULGARE MART)*

A study on the tucumã production chain in the state of Amapá, published by Farias et al. (2018), points to the importance of adopting food practices in the exploitation of this natural resource. According to the authors, the selective collection of fruits and the use of management techniques can ensure the preservation of the palm tree and the maintenance of local biodiversity. In addition, the tucumã production chain in the Lower Amazon was studied by Lima et al. (2019), who highlight the role of women farmers in the collection and processing of fruits.

Currently, cooperatives work with various products extracted from sociobiodiversity, including andiroba, murumuru and tucumã. A few years ago, the tucumã palm tree - also known as tucumanzeiro - was seen by the countryside as a "pest of the forest", because of its thorns. The Amazon region is home to many oilseed species with economic potential and one of them is the tucumã (*Astrocaryum vulgare Mart*.). It is a perennial palm tree where fruits and seeds are used for human and animal food; leaves as fibers and stems in the construction of houses by the populations of the interior of the Amazon (Yuyama, 2008; Souza et al, 2010).

The species blooms between March and July and bears fruit in the rainy season, that is, from January to April. However, if well managed, this palm tree can bear fruit throughout the year (Cymerys 2005; Lima, et al., 2013). The Tucumanzeiro Palm is an undemanding species, in terms of soil and water, it occurs in primary and secondary forests, being fully adaptable to cultivated pastures, poor and degraded soils. In the Amazon Region, it is a species widely used by the local population, from the leaves that have high-strength fibers, stems, to the fruits (Oliveira, 1998; Lorenzi et al. 2004; Neves, 2012).

The Tucumã has a great capacity for regeneration, having several stems per clump (Menezes et al, 2012). The fruits of the tucumanzeiro also have market potential for food, cosmetics, handicrafts and oil. Its pulp is rich in carotene (pro-vitamin A), proteins, carbohydrates, minerals and fiber. It can be consumed "in natura" or in the form of juice, liqueur, ice cream and cream. It produces an average of 37.5% of yellow oil and almonds, 30 to 50% of white oil, both edible (Cavalcante, 2010). It also has a sticky and fibrous pulp. In addition, it also has a high energy value (247 calories per 100 grams), in addition to carbohydrates (19.1%), lipids (16.6%) and protides (3.5%) (Portal Da Amazônia, 2018).

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This fruit is a good source of beta-carotene, which is an antioxidant that plays a very important role in health.

Figure 2: Dried Tucumã do Pará (Astrocaryum vulgare) and almond.

Source: Auror Registry, 2022.

TUCUMÃ EXTRACTION AND THE SDGS (SUSTAINABLE DEVELOPMENT GOALS)

- ✓ SDG 1: No Poverty

  The extraction of tucumãs, carried out mainly by small rural producers and traditional communities, represents a significant source of income. Extractive cooperatives provide an organized structure for the commercialization of these products, allowing producers to obtain a fair price and, consequently, improve their economic conditions. The eradication of poverty involves ensuring sustainable and dignified livelihoods for these populations, something that the extractive activity of tucumãs can favor when carried out in a fair and sustainable manner.

- ✓ SDG 2: Zero Hunger and Sustainable Agriculture

  The collection of tucumãs also contributes to the food security of local communities. Tucumã is a nutritious source of food, rich in vitamins and essential oils, and is used both in local food and in derived products that can be sold. In addition, the promotion of sustainable agricultural practices in the collection and management of tucumãs helps to preserve the Amazon ecosystem, ensuring the continuity of biodiversity and natural resources. As well as other extractive products such as açaí and Brazil nuts, which are also

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important sources of nutrition, while crop diversification contributes to the resilience of communities.

- ✓ SDG 16: Peace, Justice and Strong Institutions

  Organizing in extractive cooperatives can promote peace and social justice by empowering local communities and ensuring that they have a voice and representation in decision-making processes. Cooperatives function as local institutions that strengthen social cohesion, resolve conflicts, and promote economic justice, creating a more stable and equitable environment. In addition, the transparency and participatory management of cooperatives contribute to the construction of more effective and accountable institutions.

- ✓ SDG 17: Partnerships and Means of Implementation

  Partnerships are fundamental to the success of extractive cooperatives and to the promotion of sustainable development in the Amazon. Collaboration between governments, NGOs, the private sector, and extractive communities themselves is essential to provide technical, financial, and logistical support. Training programs and access to broader markets can be made possible through these partnerships, enhancing the positive impact of tucumã extraction in the region.

We can also highlight, in a complementary way, SDG 12; 13 and 15, because when we consider Responsible Consumption and Production (SDG 12), extractive cooperatives in the Amazon promote responsible consumption and production by implementing sustainable management practices and educating producers about the importance of conserving natural resources. As well as, when we highlight the Action against Global Climate Change (SDG 13), we are talking about the preservation of the Amazon forests, promoted by the sustainable management practices of cooperatives, which is essential for the mitigation of climate change. Since forests act as important carbon sinks, their conservation contributes to the reduction of greenhouse gas emissions.

Therefore, SDG 15, Life on Land, refers to the maintenance of terrestrial biodiversity and is directly benefited by the sustainable practices of cooperatives. In other words, the preservation of species such as tucumã, murumuru, andiroba and Brazil nut trees are fundamental for the health of Amazonian ecosystems.

However, despite the evident benefits, it is crucial to take a critical approach when analyzing extractive activities in the Amazon. Because the sustainability of these practices

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depends on careful management of natural resources and the balance between economic development and environmental preservation. The overexploitation of tucumãs, for example, can lead to ecosystem degradation and biodiversity loss. Therefore, the implementation of sustainable management practices, combined with effective public policies and respect for the rights of local communities, is essential to ensure that economic benefits do not come at the expense of the environment. One way to align this would be a Payment for the Environmental Service provided (PES) by these small rural producers in relation to the preservation of the standing forest.

In addition, it is important to recognize and mitigate external threats, such as the advance of deforestation and illegal activities, which put both traditional ways of life and the integrity of the Amazon rainforest at risk. In this sense, environmental governance and enforcement play crucial roles. In summary, the extraction of tucumãs by extractive cooperatives in the Amazon can contribute significantly to SDGs 1, 2, 12; 13; 15; 16 and 17, as long as it is conducted in a sustainable manner and with a strong focus on social justice and environmental preservation. The articulation between different stakeholders and the implementation of integrated policies are fundamental to ensure that Amazonian sociobiodiversity is an engine of sustainable and inclusive development.

RESULTS

DIAGNOSIS ACCORDING TO COOPERATIVES

The cooperatives negotiate the fruit of tucumã (green/dry), chip, almond, oil and/or butter with the companies Natura, Citro Bio, Citro Oil, Amazon Oil, Sambazon, Bouthhouse, Symrise (German), Beraca, 100% Amazônia, among others not yet identified and some Restaurants such as Dom Giuseppe (RJ), Tratoria (RJ), Asa Açaí (RJ) and Aprasível (RJ). Some cooperatives are accredited by the Organization of Cooperatives of Brazil (OCB) in the municipalities of interest in this research.

Agricultural Cooperative of Family Producers of Irituia D'Irituia – Coopirituia

The D'Irituia Cooperative (Agroecological Products of the Amazon), founded on 12/16/2011, is involved in the collection and drying of tucumã negotiated in the shape of Almonds with the company Natura and Beraca, the latter, in smaller quantities, for only the products/quantities that "remain" after the supply of Natura. The D'Irituia cooperative, according to information obtained *in loco,* has 42 cooperative members, 23 men and 19

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women. It arose due to the fact that some family producers are not served by agricultural policies for small producers, whose main socio-biodiversity products traded are Tucumã, Ucuuba, Mucajá, and Brazil nuts (Souza et al., 2022).

It is also worth noting that, during the years 2019 and 2020, Coopirituia began the migration of collection and sale of fresh tucumã to dried tucumã for the company Natura. In 2021, Coopirituia learned the drying and storage process after training by Natura/GIZ and delivered 89t. of dried tucumã (50% drop of the fruit in natura) and in 2022 49t. Information obtained on 05/25/2023 revealed that the quantities fell due to the need defined by Natura.

In the same year, he began the learning process for the "breaking" of the dried tucumã and transformation into Almond, supplying 12t. of Almond to the Beraca company, justifying the sale so as not to have losses, but the costs were very high and the profitability basically did not exist. However, it also supplied 54t. of almonds to the company Natura in 2022, meeting the contractual demand even under adverse conditions, as reported by the administrator because they were adapting to the new process, aligning machinery to break the fruit and developing forms of storage that did not give "drill" to the fruit before commercialization.

It is worth mentioning that the machinery and training was provided by the company Natura and adapted by the cooperative members with regard to the machine to break the fruit that had to be adapted by a cooperative member because the one supplied was not enough, according to reports from the secretary of D'Irituia. Thus, the new machine was able to break up to 3t./day, totaling 90t/month, to meet demand. The purchasing company (Natura) is the one that is concerned with all the calculation of the chain (collection, freight, taxes, and percentage of 15% of profitability for the cooperative as informed by the cooperative secretary).

Therefore, it can be said that COOPIRITUIA is in an intermediate process of the tucumã value / supply chain. That is, it buys tucumã (extractivism) from rural producers, does the process of drying, pulping, breaking the pit to obtain the almond and the commercialization of tucumã pulp, splinter and almond with some companies. It does not have any process for the manufacture of tucumã oil or butter, as yet according to the graphic representation of the representative chain structured below:

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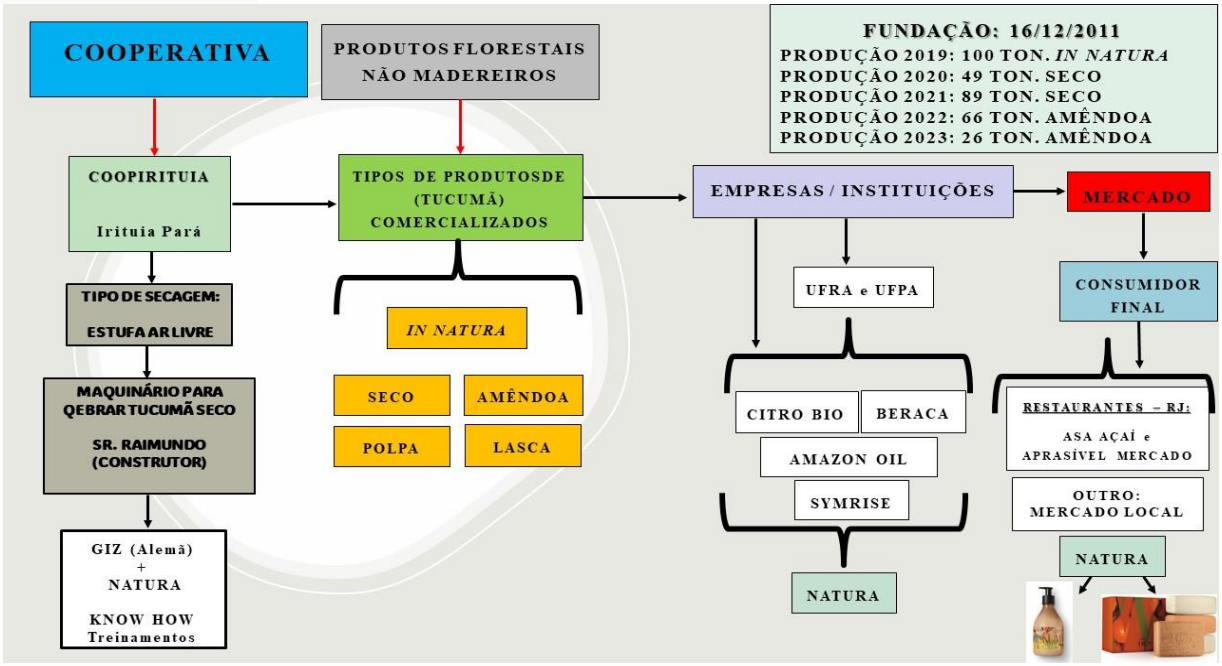
Figure 3: Value Chain and Production Stage of the Agricultural Cooperative of Family Producers Irituienses D'Irituia – COOPIRITUIA



Source: Elaboration by the authors (2024).

Mixed Cooperative of Family Farmers and Extractivists of Caetés – COOMAC

COOMAC was founded on 03/05/2010 and has 138 cooperative members in its Minutes of creation. However, only 55 are active and participating in the cooperative, 50% of which are women. Coomac works with various products from family farming to meet school meals and to care for animals. Regarding oilseeds, it works with tucumã seeds, bacuri and murumuru.

In these cases, they sell the product *in natura*, dried and the almond after breaking the pit with their own machinery and drying in open-air ovens and through their own machinery (rotary dryer) supplied by the company Natura. The cooperative also works with buriti, Andiroba and coconut oil, bacuri butters, tucumã and murumuru.

Its main buyers/customers are the company Natura, Citro Bil, Beraca and Citro Oleo.[6] It is also worth noting that in 2022 900 tons of fresh tucumã were collected in 2022 and in 2023 only 235 tons, according to information from the person responsible for production in preliminary contact by phone, together with the president of the cooperative.

However, these records do not yet appear in the PEVS/IBGE statistics for the year 2022, which shows the need for the IBGE to adjust its records and data systematization

[6] Information available at the electronic address: https://paracooperativo.coop.br/noticias/1175-coomac-braganca-complet-anos-de-atividades-com-verticalizacao.

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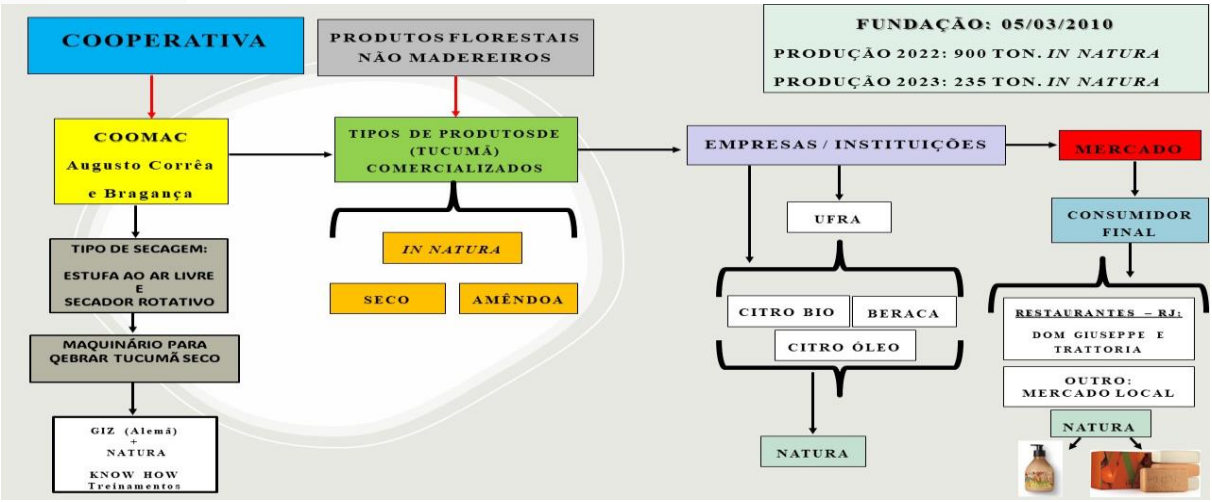
processes, since tucumã is being collected and marketed by cooperatives of family farmers and extractivists in the states of Pará and Amazonas.

Therefore, it can be said that COOMAC is in an intermediate process of the tucumã value / supply chain. That is, it buys tucumã (extractivism) from rural producers, does the process of drying, pulping, breaking the pit to obtain the almond and the commercialization of tucumã pulp, and almond with some companies. It does not have any process for making oil or tucumã butter yet. A situation very similar to COOPIRITUIA, except for having a rotary dryer supplied by Natura, while the drying process is still done by artisanal greenhouses in the sun. Thus, the following image demonstrates in a representative way the structuring of this chain:

Figure 4: Value Chain and Production Stage of the Mixed Cooperative of Family Farmers and Extractivists of Caetés - COOMAC



Source: Elaboration by the authors (2024).

Family Farmers Production Cooperative of the Municipality of São Miguel do Guamá – COPASMIG

COOPASMIG is composed of 140 cooperative members, with only 60 active, 18 women and 32 men, according to information obtained at a meeting on 10/11/2024. Its origin was through the union of farmers in the municipality who were already inserted in farmers' associations in the municipality. Thus, it was founded on 06/26/2017.

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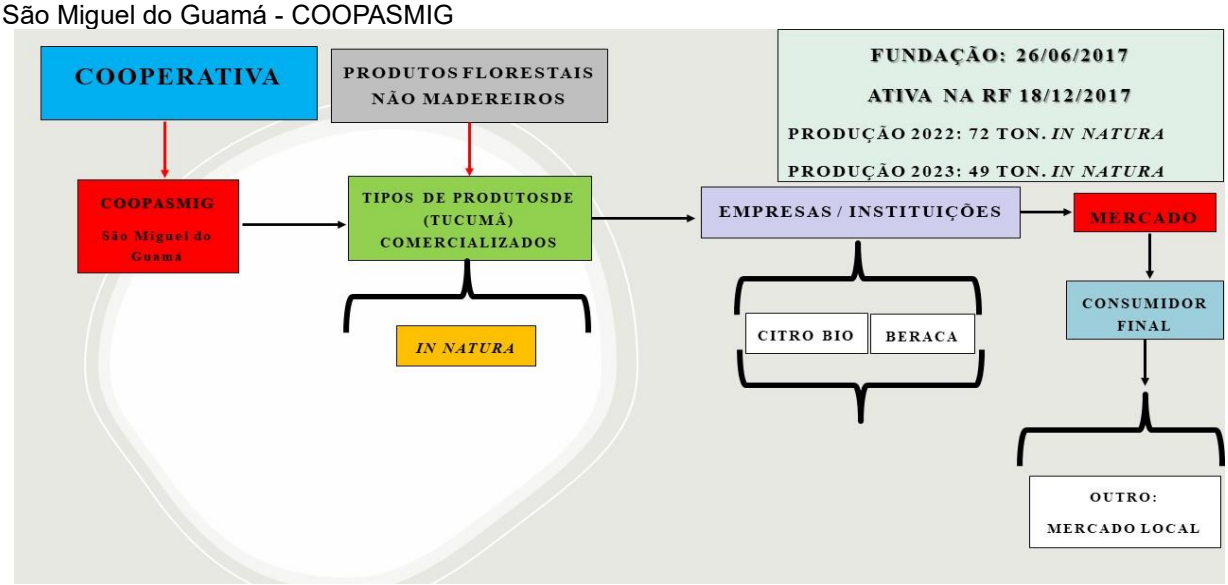
Its production / commercialization of tucumã in 2022 was 72t. and in 2023 49 ton. This production was sold to the companies Citro Bil and Beraca. It is also worth noting that the cooperative provides technical assistance services and supply of agricultural inputs[7].

The process of commercialization of the fruit (tucumã) is only in *the fresh* format, they still do not have open-air greenhouses or electric drying machinery. As well as they also do not have machinery for breaking the pit for the sale of almonds with higher added value or the manufacture of butter and tucumã oil, as highlighted by the CEO Maria do Espírito Santo Silva in a preliminary telephone contact made in January 2024. In other words, the cooperative is still in the initial phase of extractivism and commercialization with only two companies.

Figure 5: Value Chain and Production Stage of the Family Farmer Production Cooperative in the municipality of São Miguel do Guamá - COOPASMIG



Source: Elaboration by the authors (2024).

Mixed Agroextractivist Cooperative of Santo Antônio do Tauá – Camtauá

CAMTAUÁ, founded in 2010, brings together 44 families who collect and process andiroba, murumuru and tucumã in the vicinity of Belém, Pará. The entire production of the cooperative is sold to Natura, a cosmetics company that was a pioneer in exploring bioactives present in species typical of the Amazon region.

Camtauá has been operating for 14 years in the extractive sector, contributing as a source of income for more than 100 families, in the municipalities of Santo Antônio de Tauá, Colares, Vigia de Nazaré and São Caetano de Odivelas.

[7] Information available at the electronic address: https://www.coopasmig.com.br.

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> "We have been developing this work for more than ten years here in Tauá, contributing to the local development of traditional families and we have a very good partnership with Natura, which provides support, gives all this financial management support, and which always accompanies our daily lives", highlights the production coordinator of Camtauá. He also reports: "Our work is precisely to prevent and preserve. Camtauá's motto is 'preserving and producing in the Amazon'. So, we first preserve it and then we start producing and, with all this we do today, we keep the forest standing. There are people who say 'the Amazon is ours', but there are few who make this happen, working side by side with nature", he assured.

Currently, Camtauá is in the processing phase of tucumã *in natura*. That is, pulping, drying, breaking and marketing almonds, as informed by the president in an interview held on 04/08/2024. Therefore, the manufacturing processes for processing almonds to obtain tucumã oil and butter have not yet been included. Thus, the following image demonstrates in a representative way the structuring of this chain and its production/extractivism and marketing volumes in the period from 2019 to 2024.

The cooperative's expectation, after the sharing of knowledge from the universities (Federal Rural University of the Amazon – UFRA and University of the Amazon – UNAMA) on the inclusion of the costs of social and environmental opportunities in the cash flow and, in turn, the return on investment in the preservation of the traditions and knowledge of the communities and natural assets in the prices of products, negotiations with the plaintiff companies lead to adjustments to adequately remunerate social and environmental services not yet computed (Santana and Gomes, 2024b).

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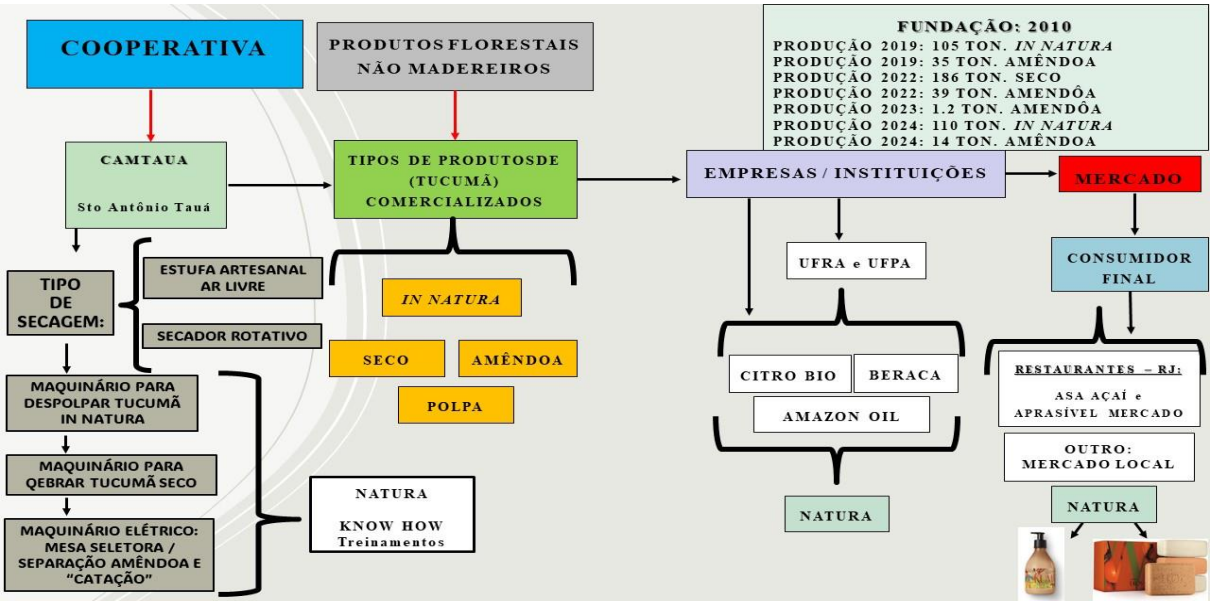
Figure 6: Value Chain and Production Stage of the Mixed Agroextractivist Cooperative of Santo Antônio do Tauá – CAMTAUÁ



Source: Elaboration by the authors (2024).

Cooperative of Fruit Growers of Abaetetuba (Cofruta do Brasil)

COFRUTA, founded on March 2, 2002, based on the principles of cooperativism, to develop actions aimed at raising the productive, organizational and commercial potential of products from family farming and solidarity economy

The Cooperative currently has a membership with 105 cooperative members, 70 men and 35 women, of these, 22 are young people between 18 and 34 years old. It brings together farmers with an economic base family that is cooperated with it in order to develop actions to increase the productive, organizational and commercial potential.

The current occupation of its inhabitants is restricted to extractivism and family farming (fruit growing, subsistence crops of corn, cassava and rice). Extractivism includes fishing activities, hunting of wild animals and extraction of resins, essences and congeners of plant nature and, mainly, the extraction of açaí, tucumã, andiroba and murumuru.

The Cooperative obtained the ecological certification of the açaí produced by the Ecological Market Institute (IMO), in Switzerland, which attests that the fruit is managed in a sustainable way, without causing damage to the environment.

The cooperative values the participation of cooperative members and their families based on the participatory and constructive methodology. In addition to respecting natural resources, COFRUTA essentially respects its human resources, and the fair price is one of the Cooperative's policies, so that this payment is adequate to the real value, regardless of

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the market offer, during harvest periods: this measure stems from the tendency for the price to fall when there is greater supply in the market.

COFRUTA, based on market information, participates in the main Organic Products Fairs to promote its products, and stands out for the demand of several international companies such as Sambazon**,** Bolthhouse in addition to Beraca, national, interested in fresh açaí and other extractive products.

Therefore, it realized the opportunity to expand its market scale and actively launched itself in an attempt to reach new markets. However, initially, it would not use its agroindustry to process the fruit, that is, it would sell only in *natura* form. In addition to the companies mentioned above, Natura currently has Natura as one of its main customers, both in the supply of açaí in natura and in the supply of oilseeds such as murumuru and tucumã (Silva, 2010). For Tucumã, it sells it both in *natura* and dry form and in the form of almonds, oil and butter. It has a mini-industrial park for processing oilseeds.

Commercialization is also done in retail for direct customers (2%) and wholesale for third parties and institutional markets. Its main markets are the Federal Government through the National Supply Company (CONAB) and Food Acquisition Program (PAA) and the National School Feeding Program (PNAE) through third parties such as the Agroindustrial Cooperative of Igarapé-Miri (CAIPIM) and the Cooperative for Extraction and Development of Barcarena (CEDAB), as stated by the former president of the cooperative in an interview held in March 2024. As well as sells to Pastoral de Criança, Pastoral do Menor, Association of Parents and Friends of the Exceptional of Abaetetuba (APAE), Fazenda da Esperança, Mesa Brasil SESC Program and Abaetetuba City Hall – which delivers through simultaneous donation to the municipalities[8].

[8] Information available at the electronic address: https://www.coopasmig.com.br https://diegosmith.wixsite.com/cofruta/quem-somos.

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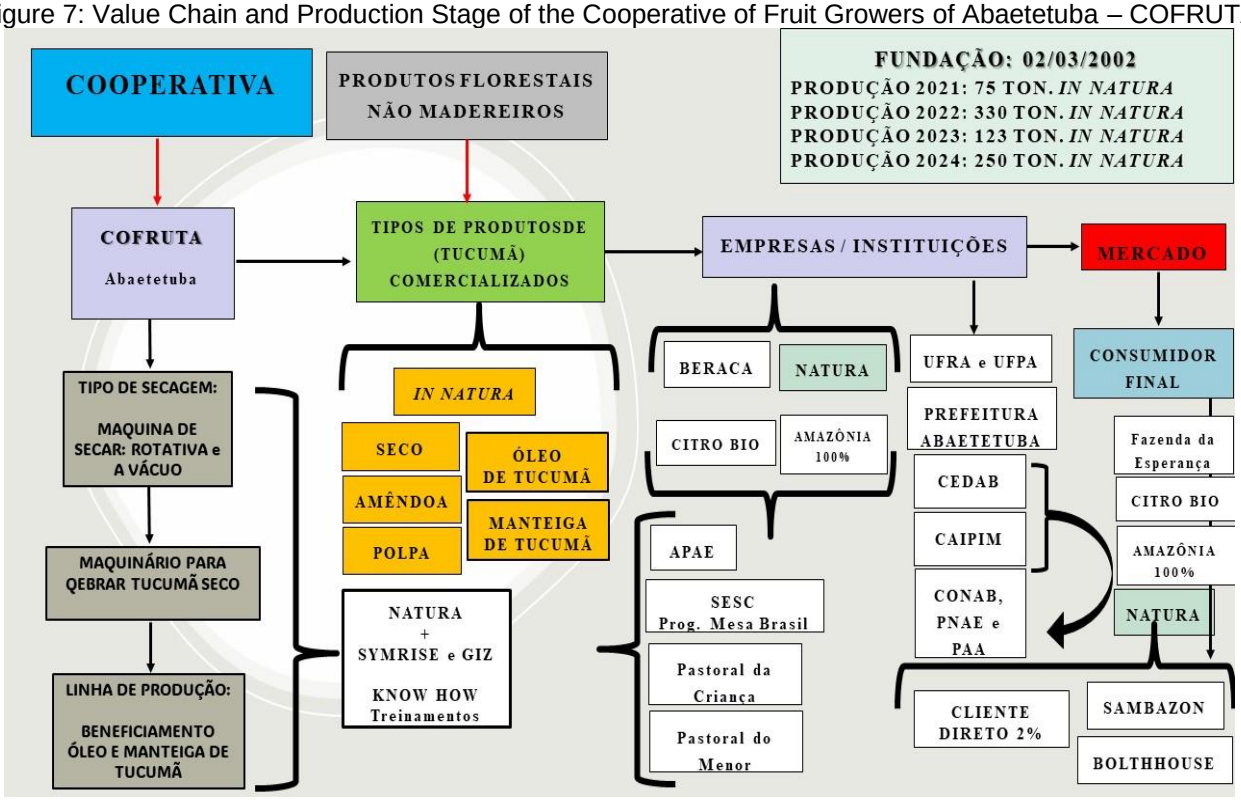
Figure 7: Value Chain and Production Stage of the Cooperative of Fruit Growers of Abaetetuba – COFRUTA



Source: Elaboration by the authors (2024).

The cooperative manages an industrial fruit processing unit with an installed capacity of 800kg per day. Initially, the unit's work goal was to produce syrups and fruit jelly for school meals in Abaetetuba and neighboring municipalities. However, due to the inconstancy of this market, Cofruta was forced to modify its product line and operate in its first years in the frozen pulp market. Mainly, with the açaí fruit, whose market demand has grown continuously over the last 10 years, as stated by the former president of Cofruta and the agronomist and current technical consultant.

Also according to COFRURA's technical consultant, the processing of tucumã for the manufacture of pulp and oil is what provides greater added value for the commercialization of the tucum product/by-products, and is what causes an increase in revenue on the part of the cooperative, that is, it increases revenue. However, the process of pulping and oil production (figures 8 and 9) are slower, more expensive, and require greater participation of the cooperative members in their manufacture. Thus, below is the flowchart of the steps necessary for this production:

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Figure 8: Stages of the Fruit Pulp Production Process (tucumã)

Source: Prepared by the Technical Consultant of COFRUTA, 2024

Figure 9: Stages of the Production Process and manufacture of vegetable oil and butter

Source: Prepared by the Technical Consultant of COFRUTA, 2024

Synthesis of the production system between cooperatives and their resources

Currently, the cooperative has been gaining market share in the commercialization of frozen pulp, mainly in the states of São Paulo and Rio de Janeiro[9]. Where its main partners are: UFPA; PITCPES (Technological Incubator of Popular Cooperatives and Solidarity Entrepreneurship); STR (Rural Worker Union of Abaetetuba); IFPA; NATURA; SAGRI (Secretariat of Agriculture of the State of Pará).

[9] Information available at the electronic address: https://agroecologiaemrede.org.br/experiencia/manejo-e-comercializacao-de-especies-frutiferas-nativas-da-amazonia-cofruta-abaetetubapara/.

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These cooperatives usually sell the products derived from Tucumã (pulp, almond, chip, oil, *fresh fruit, butter* and dried tucumã) with restaurants in Belém and Rio de Janeiro, also with city halls, with companies in the cosmetics sector, companies that process non-timber forest products and processing companies in general (middlemen). In addition to sharing the fruit for research at universities as a form of cooperation (Silva et al., 2020).

Thus, the following image demonstrates in a representative way the structuring of this chain that, in addition to the extraction of tucumã in natura, also carries out the processes of pulping, drying, breaking of tucumã for almond extraction and, unlike the other cooperatives highlighted above, has a production area (factory) for the extraction of tucumã oil and butter with technologies provided by Natura and the companies: Symrise and GIZ (*Know How*) in the form of equipment provided and training carried out.

Such cooperatives usually sell the products derived from Tucumã (pulp, almonds, chips, oil, fresh fruit , *butter* and dried tucumã) with restaurants in Belém and Rio de Janeiro, with city halls, with companies in the cosmetics sector, companies that process non-timber forest products and processing companies (middlemen). In addition to sharing the fruit for research at universities as a form of cooperation (Silva et al., 2020).

Table 1: Current Stage of Cooperatives in the Value Chain and Their Resources

Cooperative	Current stage in the value chain	Product(s) and By-Products	Relationships	Resources
COOPIRITUIA	Dry Tucumã Breakdown and Commercialization of By-products. WITHOUT industrialization and processing of butter and oil. NOTE: Intermediate Stage.	• tucumã *in natura*; • dry tucumã; • lasca de tucumã; • Tucumã pulp • Tucumã almond.	COMPANIES/INSTITUTIONS: ▪ UFRA and UFPA; ▪ Citro Bio; ▪ Amazon Oil; ▪ Symrise; ▪ Beracah; ▪ Natura; MARKET: ▪ ASA Açaí Restaurant; ▪ Aprasível Mercado;	✓ Dry Tucumã Breaking Machine; ✓ Storage Shed; ✓ Handmade Outdoor Greenhouse; ✓ Freezer for Storage of Tucumã Pulps and Chips; ✓ The available land and the large amount of extractive products
	Breakdown of Dry Tucumã and Commercialization of some By-products.	• tucumã *in natura*; • dry tucumã; • Tucumã almond.	COMPANIES/INSTITUTIONS: ▪ UFRA ▪ Citro Bio; ▪ Citro Oil ▪ Beracah; ▪ Natura;	✓ Dry Tucumã Breaking Machine; ✓ Storage Shed;

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COOMAC	NO industrialization and processing of butter and oil and NO industrialization of PULPS AND CHIPS. NOTE: Advanced Initial Stage.		MARKET: ▪ Dom Giusepe Restaurant - RJ; ▪ Tratoria RJ Restaurant;	✓ Electric Rotary Dryer; ✓ Handmade Outdoor Greenhouse ✓ The available land and the large amount of extractive products
COOPASMIG	Commercialization of Tucumã in natura. NO stone breakage for almond extraction; NO industrialization and processing of butter and oil and NO industrialization of PULPS AND CHIPS. NOTE: Initial Stage.	• tucumã *in natura*;	ENTERPRISES: ▪ Citro Bio; ▪ Beracah;	✓ Storage Shed; ✓ The available land and the large amount of extractive products
CAMTAUÁ	Dry Tucumã Breakdown and Commercialization of By-products. WITHOUT industrialization and processing of butter and oil and NOTE: Intermediate-Advanced Stage.	• tucumã *in natura*; • dry tucumã; • tucumã pulp; • tucumã almond;	COMPANIES/INSTITUTIONS: ▪ UFRA and UFPA ▪ Citro Bio; ▪ Amazon Oil; ▪ Beracah; ▪ Natura; MARKET: ▪ ASA Açaí Restaurant; ▪ Aprasível Mercado;	✓ Dry Tucumã Breaking Machine; ✓ Storage Shed; ✓ Handmade Outdoor Greenhouse; ✓ Freezer for Storage of Tucumã Pulps and Chips; ✓ The available land and the large amount of extractive products; ✓ Electric Tucumã Pulping Machine; ✓ Electric Selectronizing Machine / "Picking"; ✓ Rotary Dryer;

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				✓ Electric Tucumã Pulping Machine; ✓ Vehicle for Freight (Loading and Unloading from Tucumã);
COFRUIT	Dry Tucumã Breakdown and Commercialization of By-products. WITH industrialization and processing of butter and oil. OBS: Advanced Stage.	• tucumã *in natura*; • dry tucumã; • tucumã pulp; • tucumã almond; • tucumã oil; • Tucumã butter.	COMPANIES/INSTITUTIONS: ▪ UFRA and UFPA ▪ PREFECTURES ▪ CEDAB; CAIPIM; CONAB; PNAE; PAA; ▪ SESCA; APAE; PASTORAL DA CRIANÇA; PASTORAL CARE OF MINORS; ▪ Citro Bio; ▪ Amazon 100% ▪ Beracah; ▪ Natura; MARKET: ▪ Fazenda da Esperança; ▪ Sambazon; ▪ Bolthhouse; ▪ Symrise; ▪ GYZ;	✓ Dry Tucumã Breaking Machine; ✓ Storage Shed; ✓ Handmade Outdoor Greenhouse; ✓ Freezer for Storage of Tucumã Pulps and Chips; ✓ The available land and the large amount of extractive products; ✓ Electric Tucumã Pulping Machine; ✓ Electric Selectronizing Machine / "Picking"; ✓ Rotary Dryer; ✓ Electric Tucumã Pulping Machine; ✓ Vehicle for Freight (Loading and Unloading from Tucumã); ✓ On-site Technical Assistance; (Danylla Dra in Agronomy).

Source: Prepared by the authors, 2024.

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Dyer & Singh (1998) and Lavie (2006) highlight that companies could become competitive based on the cooperation and collaboration relationships established with other firms operating in their environment. Helfat Peteraf (2003) and Teece, et al. (1997) state that Capabilities are business processes that reflect organizational knowledge to combine or use resources in order to perform specific functions.

In this sense, it can be said that based on table 1, each cooperative alone will not be strong enough to compete with large companies in large markets. However, united by relationships and with rare and exclusive resources shared between them, they will be able to face large companies and in the most diverse competitive markets when they start to interact with all stakeholders, thus establishing new strategic partnerships or even solid distribution networks as important sources of competitive advantages.

Resource-Based View Theory (TVR) and Resource-Based Theory (TBR) are analytical frameworks that help understand how businesses can gain competitive advantage through the effective management of their resources and capabilities. Thus, the Resource-Based View Theory (TVR) suggests that a company should identify, evaluate, and manage the resources and capabilities that are valuable, rare, difficult to imitate, and non-replaceable (VRIN). These resources and capabilities can be tangible, such as production facilities, or intangible, such as technical knowledge. Just as Resource-Based Theory (TBR) emphasizes the importance of developing and maintaining resources and capabilities that provide sustainable competitive advantages. This can include investing in research and development, training employees, and building relationships with suppliers and customers.

In the case studies presented, this knowledge is not dominated by cooperatives, given that they do not have structured cash flows with the inclusion of economic, social, and environmental opportunity costs, the latter completely absent, so that control and monitoring routines of these cash flows enable the construction of socio-bioeconomic feasibility indicators according to Santana (2020) and Santana & Gomes (2024a).

Based on this, some cooperatives began to invest in specialized technical assistance, training and qualification for cooperative members, such as workshops in partnership with universities and new functionalities for tucumã, such as handicrafts, construction of houses with the stems; food as is already done in Amazonas, among others.

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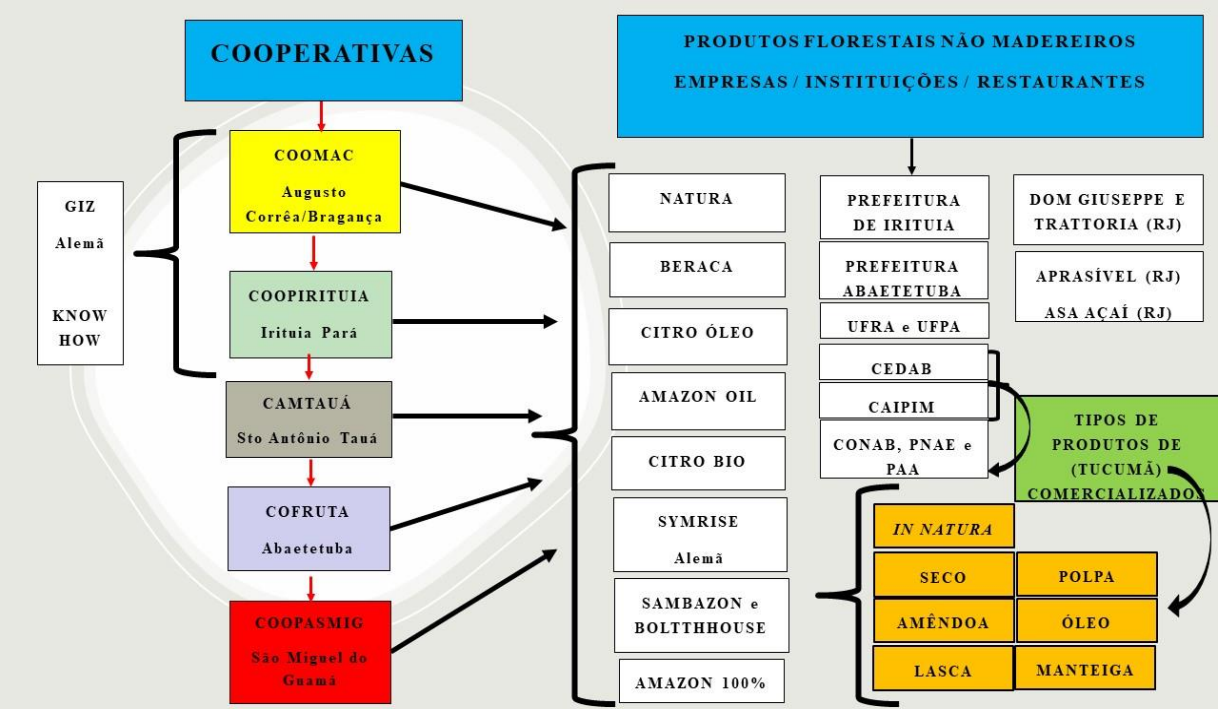
Thus, figure 10 below highlights these relationships, in a summarized way, of the configuration of cooperatives as a structuring link in the value chain of Tucumã.

Figure 10: Flow of channels accessed by the cooperatives of D'Irituia (Coopirituia), Coopasmig, Cofruta, Camtauá and Coomac in the years 2018 to 2023.



Source: Adapted from Silva et al. (2020), Souza (2020) and elaborated by the author (2024).

FINAL CONSIDERATIONS

From information obtained in research in five cooperatives in the state of Pará and a review of relevant literature on the subject, it was possible to identify that the scope of the theoretical foundations applied by the cooperatives is still low and/or insignificant to produce an impact on local development. This occurred through the analysis, associating value creation with Relational Value (VR), VBR (Resource-Based View Theory) and Cooperation and Associativity in Extractive Activities in cooperatives in the value creation process. This theoretical knowledge, although it has contributed to the configuration and development of clusters, and its influences on local growth trajectories, through the increase in formal employment, the income of cooperatives and cooperative members and, consequently, of small producers, in the perspective of achieving SDGs 1,2, 12. 13, 15, 16 and 17, this process of innovation and development is still barely perceptible in the cases studied.

The research problem was answered with the description and analysis of the installed management capacity and the relations with the internal and external interest

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groups of the cooperatives, in addition to the search to add value to the tucumã. This was accomplished through the relationships pertaining to each product in each cooperative, according to the resources available and used. With this, the processes of COOPASMIG; COOMAC; COFRUTA; CAMTAUÁ and COOPIRITUIA were described from the phase of acquisition of raw material supplied by the cooperative producer, through the process of processing the product until its commercialization to the final customer (large company). It was evidenced that the price paid for the product delivered to the cooperatives by the cooperative members does not remunerate the productivity of labor or natural assets, indicating that the path for the theoretical foundations of VR and VBR to be implemented and generate the expected results for all links in the value chain of socio-biodiversity products is still far away.

In addition, a qualitative description was made about each process and the marketing partnerships, highlighting the logistics, the acquisition, the type of product sold and the form of storage and its capabilities. All this from the perspective of economic growth with social inclusion and environmental sustainability. Therefore, thinking about integrating these expertise with the assumptions of the dimensions of sustainability in order to build solid inclusive strategies, for value creation through cooperation between the agents involved (stakeholders) to share *know-how* and technologies becomes a dream envisioned by researchers.

In this context, extractive products have proven to be an interesting alternative to promote social inclusion and income generation for local communities. Value creation through cooperatives can be an important strategy to promote the social and economic inclusion of the rural population, while contributing to the conservation of natural resources. It is worth noting that the cooperatives that sell Tucumã (*Astrocaryum Vulgare Mart)* with the market (large companies) do not have appropriate government or business support for their economic, social, environmental and ecological development so that their products can have a higher added value. In other words, in addition to the lack of exchange of information between cooperatives and benchmarking of processes and processing to create value for products derived from tucumã, there is also no qualified external technical assistance in most cooperatives that provides training, qualification and investments. In other words, a total absence of public policies aimed at this follow-up.

The application of relational value theory in the context of extractive cooperatives in the Amazon should demonstrate how value creation can be maximized through

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cooperation and the enhancement of relationships between the various actors involved. Because, by sharing knowledge and valuing the historical-cultural heritage, these cooperatives would not only promote environmental sustainability, but also ensure the economic viability and social development of local communities. Because extractive products such as tucumã, murumuru, açaí, andiroba and Brazil nuts are examples of resources that, when managed sustainably, can offer economic, social and environmental benefits. However, this was not what was perceived in the cooperatives surveyed. Therefore, sustainable extractive practices, driven by cooperation, as much as they are fundamental for the preservation of socio-biodiversity and for the achievement of the Sustainable Development Goals (SDGs), still need structured public policies for full implementation. (Cook, 1981; Zeuli & Cropp, 1996; Birchall & Simmons, 2015; Novkovic, 2019; Souza & Carvalho, 2020; Pereira & Oliveira, 2022; Silva, Santos & Gomes, 2023).

It can also be said that the tucum stems in the Amazon, in addition to the economic benefits, produce environmental quality and conservation of the natural resources of the Amazonian flora and fauna, producing various ecosystem services such as: maintenance of biodiversity, water quality, recovery of degraded areas, thermal comfort, maintenance of soil fertility and improvement of its quality, among others. In addition, the evaluation of ecosystem services provided by small rural producers is an important step towards recognition and appreciation. Therefore, it is being considered as a product with the potential to be cultivated in agroforestry systems and even in monoculture, as it is being propagated by cooperative producers. Likewise, the management of clumps in the forest is evolving to increase production per hectare and the productivity of labor and natural forest.

Cooperation and associativity are fundamental pillars for the extractive activities of cooperatives and small rural producers in the Amazon. By promoting economic, social and environmental sustainability, these practices would contribute significantly to the preservation of socio-biodiversity and to the achievement of the Sustainable Development Goals. In other words, extractive cooperatives would rely heavily on cooperation to survive and thrive. Through collaboration, these producers could share knowledge about sustainable management techniques, access markets more effectively, and obtain better prices for their products. Such cooperation would not only increase economic efficiency but also strengthen social ties and community cohesion, generating social value. However, this integration was not noticed among the cooperatives surveyed, which we can say is still far from happening.

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Finally, it is highlighted that inclusive business models must be aligned with local conditions and the diverse livelihood needs and strategies of farmers. Particularly relevant here is the need to accommodate survival entrepreneurs. In this sense, it can be stated that based on table 1, each cooperative alone would not be strong enough to compete with large companies in large markets. However, united by relationships and with rare and exclusive resources shared between them, they will be able to stand out and establish strategic partnerships to consolidate distribution networks as important sources of competitive advantages.

Therefore, it is recommended that future studies can advance in the comparative evaluations of multiple cases related to extractive products and not only in the political, social and legal arrangements to improve business performance. As well as another suggestion would be studies that include the social opportunity costs and natural assets in the cash flow and, in turn, the return on investments in the preservation of these assets so that they could be included in the prices of the products. With this, the trading prices could in fact approach the "fair prices". It could still be researched about the maintenance and generation of jobs and income, which consequently affects the establishment of the family in the countryside. And, finally, a complementary study on the verification of the analytical variables of the resources that the article did not have the breath to address.

It is also worth noting that part of this research was presented at the National Administration Meeting – ENANPAD 2024, for presentation in the Logistics and Operations area in September 2024 and subsequent publication in the event's annals. On the other hand, we would like to highlight the great difficulty of traveling to collect qualitative data *in loco* due to several barriers such as great distances, difficulties in scheduling group meetings and visiting rural properties for direct interviews with the agents.

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