


Chapter 15

Development of inclusive strategies in the value chain of extractive products: The Case of Tucumã (*Astrocaryum Vulgare Mart.*) negotiated by the D'Irituia cooperative with a cosmetics company

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ABSTRACT

The objective of this work is to analyze the production processes, product quality, and environment preservation developed by the small producers of Cooperativa D'Irituia to include themselves as

suppliers of Tucumã (*Astrocaryum Vulgare Mart.*) sold with the cosmetics company Natura. The theoretical approach used in the study was the development of a value chain for agricultural and extractive products. Semi-structured interviews with directors and cooperative members were carried out to gather data and information from producers, which made it possible to understand the strategies developed for cultivation, management, collection, commercialization, the level of maturity of production, and the commercial relationship with the company. The results show evidence of inclusive aspects that enabled the inclusion of small producers and service providers in the production chain, leading them to earn income. The relationship with the large company encouraged cooperation, environmental preservation, and local development.

Keywords: Sustainability, Cooperativism, Tucumã (*Astrocaryum Vulgare Mart.*), Inclusive value chain.

1 INTRODUCTION

The importance of extractive products for the development of territories with extensive areas of forest and rural populations involved was referenced in studies by Homma (1993, 2014, 2018), Allegretti (1992), Freitas et al (2018), in which the perspective of the development, based on the inclusion of rural populations in markets for agricultural products, public policies guaranteeing minimum prices for socio biodiversity products and payments for environmental services are part of the analyzes of sustainable development and green economy or bioeconomy.

Academic interest in the strategic management of extractive product chains has expanded in recent years (BIJMAN; WIJERS, 2019). Analysis of production processes, commercialization, product quality, and preservation of the environment are important topics.

Among the strategies for inserting extractive base products in regional, national, and international markets, used by local governments, Non-Governmental Organizations (NGOs), and large companies in

the food and cosmetics sector, the Value Chain Development (DCV) model has been widely used to transform realities in which poverty is present in rural areas (DAVIS, 2006; HAGGBLADE et al., 2012; DONOVAN, STOIAN, LUNDY, 2016).

Devaux et al (2018, p. 102), state that "CVD refers to a type of intervention that aims to address poverty through improved links between companies and poor families in a value chain". The DCV takes into account the interrelationships between agricultural producers, traders, processors, distributors, and consumers to insert products and services, with unique characteristics, in value chains. This arrangement of interconnected institutions values the natural assets of these territories and provides environmental services that keep ecosystems in balance and reduce the emission of Greenhouse Gases (GHG), as stressed by Santana (2020).

From the perspective of the CVD model, there are cases in which large companies, which use primary inputs extracted from the forest, carry out actions that guide producers about the handling, storage, and logistics of these inputs, employing associations and/or cooperatives to make the relationship viable. the contract between the parties involved (cooperative company). In this process, extractivist are part of the initial link in the value chain, delivering timber and non-timber products from the forest to the next links in the chain, supplying the companies' demand, in which cooperatives play a central role.

The CVD model is used by governments in local development programs in territories and by large companies that carry out, on the one hand, interventions in local producers to guide production processes, quality, and preservation of the environment, and on the other hand guarantee the flow of extractive products that enable the continuous flow of inputs (BIJMAN; WIJERS, 2019).

According to the studies developed by Bernard, Taffesse, and Gabre-Madhin (2008), the policy of promoting agricultural product marketing cooperatives in Ethiopia was a successful strategy to increase marketing and improve rural livelihoods. , as the strategy provided members with a price, on average, 7.0% higher than that received by non-members, and there is evidence that this gain stems from the expansion of opportunities and greater bargaining power. However, not every intervention model leads to success, there are cases of small producers excluded from joining cooperatives for not having land titles (ITO; BAO; SU, 2012).

In this context of the insertion of small rural producers in local or national extraction-based input markets, it is desired to know whether, in the production processes, product quality, and environmental preservation, developed by small producers linked to Cooperativa Agropecuária dos Family Producers Irituenses - D'Irituia, is there evidence of the formation of an inclusive value chain for the oleaginous tucumã (*Astrocaryum Vulgare Mart.*) from the Cooperative-Company contractual relationship?

The research contributes to the field of inclusive strategies based on the case study of a contractual relationship between a large national company in the cosmetics industry (Natura) and small agricultural producers who collect tucumã (*Astrocaryum Vulgare Mart.*), present in forest areas. natural and secondary, in the municipality of Irituia, in the state of Pará. The tucumã collected by the producers is delivered to

D'Irituia, which performs the product selection, and logistics and makes the fiscal bureaucratic procedures possible, to send it to the processing company that will extract the oil and butter from the tucumã, used in the manufacture of beauty products sold by Big company. The objective of the research was to analyze the characteristics of the production processes, quality, and preservation of the environment developed by the small producers of the cooperative D'Irituia who act as suppliers of Tucumã (*Astrocaryum Vulgare Mart.*) commercialized with the cosmetics company Natura.

This study is structured in four sections, starting with this introduction. In the following section, the theoretical framework is presented. In the third section, the methodological procedures are presented, including the research subjects, the field procedures, and the qualitative data analysis technique. In the fourth section, an analysis is made of tucumã production in Brazil and the states of the Amazon, and the results of the interviews, considering aspects related to production and productivity, product quality, environmental protection, and the living conditions of the small producers.

2 THEORETICAL REFERENCE

2.1 VALUE CHAIN DEVELOPMENT (DCV)

Studies of value chains are present in the set of models for analyzing the competitiveness of companies developed by Porter (1985) and his collaborators. The focus is on the processes that are part of the company's set of activities and aim at creating value from the use of resources (human, financial, knowledge, physical, environmental, technological), employed in the development of cost leadership strategies or of product differentiation, which are the sources of generation of competitive advantages.

Porter and Kramer (2006; 2011) expanded the value chain concept to include the creation of value for society, defined as Creating Shared Value (CVC) that goes beyond the generation of economic value. In this concept, the value chain evolves from the capture of value by the chain's entities to create value for all the chain's entities, in this idea the sharing of value by all the chain's entities contributed to improving the well-being of all the chain's participants. It is understood that the creation of shared value is a strategic management process for the survival of organizations and the inclusion of economic agents.

To make value chains more inclusive, in which small rural producers are included in the production chains of large companies or in public policies for reducing poverty and local development, economic agents began to carry out interventions as a way of guaranteeing access to extractive inputs, ensuring the flow of meeting the company's demand and government programs (DONOVAN, STOIAN and LUNDY, 2016; SWINNEN and KUIJPERS, 2020).

The context in which value chains, defined as inclusive, arise, largely stems from the increased demand for high-value agricultural products (coffee, cereals, cheeses, cattle, fish, oils, and essences from the forest) produced or extracted sustainably by small farmers and that present themselves as new business opportunities in underdeveloped or developing countries, as long as they are part of domestic, regional and

global markets (DAVIS, 2006) and as a strategy for reducing poverty in these countries (DONOVAN ; STOIAN; LUNDY, 2016).

In this context, there is a reduction in the direct involvement of governments in agricultural product markets and exchange rate policies, eliminating interference from foreign trade policies (HAGGBLADE et al, 2012). Indeed, large food exporters, agribusiness companies and supermarket chains have implemented agribusiness actions in rural areas in some developing countries.

Devaux et al (2018, p.102) state that "CVD refers to a type of intervention that aims to address poverty through improved links between companies and poor families in a value chain". The DCV takes into account the interrelationships between agricultural producers, traders, processors, distributors and consumers so that in the combination of inputs and technological production processes, products with unique characteristics are achieved. Which leads to a heterogeneity of products that consumers are willing to buy in the market. In this sense, Donovan, Stoian, Lundy (2016) state that the better performance of agricultural value chains will benefit many people.

UNIDO (2011) understands that value chain development improves production operations and generates social benefits, such as poverty reduction, environmental performance, and gender equality, among other Sustainable Development Goals (SDGs) defined by the UN.

Therefore, DCV is an intervention activity that can be coordinated by NGOs or private companies, with the interest of maintaining a continuous flow of raw material delivery, and improving product quality, to make operations sustainable. For small producers, the interest is to increase production and productivity, secure marketing channels, and increase income and access to new services and production technologies (SWINNEN; KUIJPERS, 2020).

In this sense, it is understood that CVD has an inclusive approach when the actors involved in a value chain can implement productive practices that lead, on the one hand, to increased production, productivity, product quality, and preservation of the environment. environment by small rural producers; on the other hand, it guarantees the flow of primary raw material to companies that coordinate the intervention. As an effect, there is the generation of social benefits to small rural producers who have a low-income level or are below the extreme poverty line. Inclusive CVD is presented in the literature as a strategy of development agencies, donors and governments, being used for the development of underdeveloped regions and the reduction of rural poverty (HUMPHREY; NAVAS-ALEMÁN, 2010).

2.2 INTERVENTION PROCESS IN VALUE CHAINS

According to Devaux et al (2018), intervention processes must be designed considering, on the one hand, the institution (public, non-governmental, or private) that will coordinate the process; and on the other hand, the structure of the value chain, highlighting aspects related to the flow of products and information, the interrelationships between the different links in the chain, the governance system and the innovations present in the chain.

Inclusion in the DCV requires much more than land ownership and some financial resources. It takes knowledge, skills, social capital and support from agricultural technicians to promote inclusion. In this sense, Devaux et al (2018, p. 113) state that "[...] one should not expect them to produce significant direct benefits for the poorest", however, these poorest rural producers may have the benefit of opportunity for employment in production, processing and commercialization of agricultural products.

UNIDO (2011, p. 1) understands that a value chain intervention combines several activities according to the socio-productive reality of each participant in the chain in its initial link. It is expected that the intervention will improve the productive processes of collection, storage and processing in primary stages; relations between producers, cooperatives and companies; the flow of information, knowledge and innovations about business management and the market.

The lack of qualified professionals who can act as local facilitators, in the processes of transferring innovations, production and commercialization, is identified as a challenge that must be considered when designing the intervention (DONOVAN; STOIAN; POE, 2017). Other challenges, in this context, are the limitations of access to credit, land ownership rights and access to technologies.

For Das Nair et al (2020, p. 1), the barriers to the entry of small rural producers, in the value chains of agriculture and processing, can be overcome with innovation and adoption of technologies, with emphasis on "[...] biotechnology; production technologies; automation in grading, grading and packaging; and digital platforms and data-connected devices for market access". The authors claim that interventions that considered the use of these technologies allowed farmers in countries in Africa to increase productivity, and quality, reduce costs, access credit, markets, information and facilitate payment methods.

2.3 THE ROLE OF FARMERS' ASSOCIATIONS AND COOPERATIVES

A high number of intervention reports mention the role of associations in the process of integrating small farmers into value chains and in the adoption of negotiation strategies that make the flow of production possible and the characteristics of contracts. According to Devaux et al (2018, p. 106), "[...] associations contribute to reducing transaction costs in integrating small farmers into value chains". The contracting of the association makes possible the acquisition of technologies, the conformity of the product according to the buyer's requirements, the training of the farmers and the quality control. Meeting these factors ensures that the buyer acquires specific inputs and makes adjustments to the production process, to improve product quality and order fulfillment.

The actions of associations contribute to reducing the restrictions on the human and financial capital of members, to participate in the process of integrating small farmers into value chains (DEVAUX et al, 2018). By taking the association as the entity that will negotiate the sale of products to processing companies, small agricultural producers can bargain for better prices and contract conditions in the DCV.

In this context, farmers' associations play a key role in increasing smallholders' access to value chains and, in some cases, including farmers in a sustained and sustainable way, reducing rural poverty and

making CVD inclusive. According to Devaux et al (2018), the literature points to little evidence of the role of associations in CVD intervention strategies.

The literature suggests that cooperatives can be useful in the process of creating inclusive value chains. Cooperatives are considered institutions used by governments and companies to implement poverty reduction programs and projects, based on the inclusion of cooperative members in productive processes and to channel government benefits to specific groups that are in vulnerable conditions, concerning access to food (BIJMAN; WIJERS, 2019).

The inclusion/exclusion of small agricultural producers in farmers' cooperatives is conditioned to three aspects related to their formation (BIJMAN; WIJERS, 2019). Community orientation versus market orientation is expected when the cooperative is understood as an organization constituted for the benefit of the community, hence it becomes inclusive. Otherwise, if it seeks competitive gains, the orientation turns to the market, compromising the inclusive process.

The second aspect is related to the fact that access to the cooperative must be an option for all small farmers in a community, otherwise the exclusion of producers, due to the search for efficiency, eliminates the advantages of inclusion. The third aspect is related to internal governance that influences decision-making. In the case of organizations with a democratic bias, everyone's interest is considered.

The evolution of the value chain concept used in this research consists of going beyond the value-generating activities employed to produce, deliver and use in the manufacture of another product, it reaches the relationships between small rural producers and the large company that uses forest products as an input, in which the cooperative is the institution that mediates between these economic agents in the form of a contract. The focus on production, quality and environmental sustainability is present when forging these relationships considered in the concept of development of inclusive value chains.

3 METHODOLOGY

The research follows a qualitative approach of an exploratory nature, intending to identify gaps and potentialities that can be explored by other researchers, since qualitative research holistically observes social phenomena, seeking to appear as broad views instead of micro-analyses, which present limited views of the segments studied (CRESWELL; TASHAKKORI, 2007).

Given the research objectives, the option of the technique called case study was chosen, in which this research method is used, generally, of qualitative data collected from real events to explain, explore or write current phenomena. inserted in their context (YIN, 2001). The option of the research technique called case study is justified by the fact that this method provides a deeper study of the characteristics of the relationships between the entities in the production chain, the underlying aspects of these relationships and their inherent characteristics to their positioning in the chain of value. This method is suitable for studies of inter-organizational relationships in supply chains (BHATTACHERJEE, 2012).

The research case of interest is the Cooperativa Agropecuária dos Produtores Familiares Irituienses (D'Irituia), located in the municipality of Irituia, in the Northeast region of the State of Pará, which carried out the collection of tucumã, later commercialized with a large company, in the year from 2020.

COOPERATIVA D'IRITUIA, ten years after its foundation, D'Irituia brought together 20 family producers who were not served by federal, municipal or state policies so that together they could form a more competitive commercial organization. Today, there are already 42 members, 23 of whom are women.

“Our main products are oilseeds, such as Tucumã, Ucuuba, Mucajá and Brazil Nuts. In addition, the cooperative also works with production chains of cassava, vegetables, products of animal origin and Agroforestry Systems (SAFs), with emphasis on fruit trees. Oilseeds are already sold with companies such as Natura and Amazon Oil”, said D'Irituia member José Romano.

Six people were interviewed: four cooperative members directly involved in tucumã collection, two of whom were on the board of directors at D'Irituia before starting the contractual relationship between the cooperative and the company Natura; and two key researchers - a cooperative member who has a doctor's degree, live in the region and has followed the development of the cooperative, but does not participate in the tucumã chain, and another who developed a master's thesis taking the cooperative D' as a case study Irituia, analyzing the performance of the cooperative in the organization of the productive process and how the aggregation and absorption of value by the cooperative members was processed.

The survey of data with the interviewees was carried out from semi-structured interviews, whose questions were elaborated based on the theoretical framework. The aspects investigated in the interviews were: production and production processes; processes related to the quality standard; concern for the environment; the relationship with the cooperative.

To the interviewees who went through the cooperative's management, the questions sought to characterize the interviewees, sociodemographic aspects, D'Irituia's relationships with cooperative members, customers, regulatory institutions, technical support and the contract with the company Natura (Table 1).

Table 1 – Standardization of the interview

Interview	Position in the Cooperative	Interview time	Research Interest
A e B	Board	60m, on average per respondent.	Identify the main processes developed by the cooperative to comply with the contract signed with Natura.
C e D	Cooperated	60m, on average per respondent.	Identify how the collection, storage, quality control and logistics process were developed by the cooperative members.
E e F	Researchers	50m, on average per respondent.	Understand how producers were inserted in the value chain driven by the company Natura, which aspects were important for this inclusion and what are the technical, operational and commercial perspectives and challenges for consolidating producers in this chain.

Source: Elaboration of the authors

As a result of the interviews, transcripts of the interviewees' statements were made and read to confirm whether what was transcribed corresponds to what was recorded. Then, the content analysis technique was used to obtain indicators, qualitative or not, from the production of information, developed systematically and based on the statements of the interviewees.

The content analysis technique is one of the most used qualitative data analysis techniques by researchers that choose to use the qualitative approach. According to Bardin (1997), "a set of communication analysis techniques aimed at obtaining, through procedures, systematic and objective description of the content of messages, indicators (quantitative or not) that allow the inference of knowledge related to the conditions of production /reception [...] of these messages".

Content analysis was carried out in three stages: i) pre-analysis of responses considering aspects of production, marketing, storage, and logistics; ii) encoding of data from the recording units; iii) categorization or classification of elements according to their similarities or differences, which enables regrouping considering common characteristics. The interviews were entered into the NVivo12 software, used to obtain the frequency of occurrences of the analysis categories and subcategories. The five categories of analysis of these statements are: Production and productivity; Product quality; Prevention of the environment; Characteristics of the cooperative and Living Conditions. Having, in each category, subcategories emerged from the reports of the interviewees.

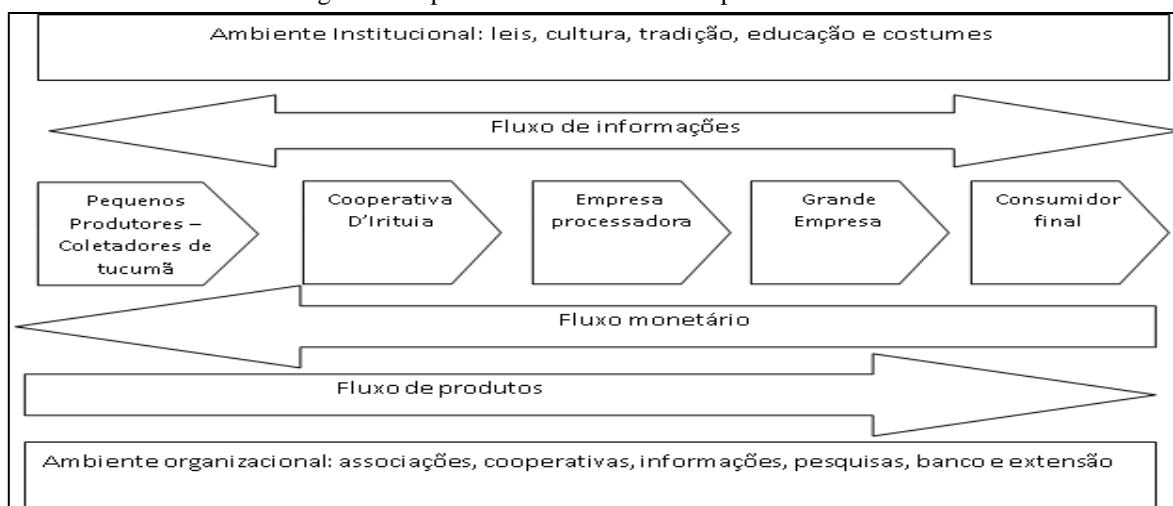
4 RESULTS ANALYSIS

The analyzes made from the systematization of the data collection referring to the categories and subcategories defined in this article will be presented. Then the interviews will be analyzed, where the perception of the interviewees was sought considering their gender condition and their situation in the research. Finally, each result generated by the NVivo 12 software is analyzed and discussed, rescuing the theoretical framework.

4.1 PRODUCTION POTENTIAL AND PRICES OF TUCUMÃ (ASTROCARYUM VULGARE MART.)

The productive chain of tucumã was outlined based on field intervention with small agricultural producers in the municipality of Irituia and who are part of Cooperativa D'Irituia. However, not all cooperative members participate in the tucumã chain. Figure 1 is a representation of the tucumã production chain.

Figure 1- Representation of the tucumã production chain



Source: Field research. Elaboration of the authors

Subtitle: Institutional Environment: laws, culture, tradition, education and customs

Information flow

Small producers - tucumã collectors / Cooperativa D'Irituia / Processing company / Large company / Final consumer

cash flow

Product flow

Organizational environment: associations, cooperatives, information, research, bank and extension

The tucumã palm has different uses by small family farmers in the municipality of Irituia, as reported by Lima et al (2014), ranging from the use of leaves to cover houses, food for small producers, for animals, obtaining fibers and other utilities. The authors point out that the fruit has potential for oil and biodiesel production. In the aforementioned study, the characteristics of fruit production and productivity are presented, in which for each hectare, there are, on average, 9.6 clumps and in each clump, 7.7 strains and 4.7 bunches, which arrive to 146 fruits. It is estimated that, if all clumps are maintained until the collection stage, the fruit production will be 132 thousand tons, which would produce 12.7 thousand tons of oil from the pulp and 4.7 tons of oil from the almonds. This tucumã productivity estimate, presented by Lima et al. (2014), demonstrates the breadth of supply that can be made available to the chemical, pharmaceutical, automobile and food industries for various uses in Irituia.

Cooperative member C even collected and transferred four tons of fruit to the cooperative in 2019, and claims that the cooperative members' production potential reaches 300 tons; while interviewee A, who is part of the board, stated that the cooperative members' production potential is 400 tons and that of the municipality of Irituia is close to one million tons.

According to data from the research Production of Vegetal Extraction and Silviculture (IBGE, 2020), production of Tucumã has been falling in Brazil in the last decade, from 517, in 2010, to 374 tons, in 2019, demonstrating a reduction of 27 %. The downward trend of tucumã production in Brazil follows an average of 23.6 tons per year, at a rate of 4.1% per year. This reduction draws attention to know what has led to the reduction in the production of this product, despite having potential for the production of biodiesel, oil, cosmetics and food, such as ice cream and popsicles, in gastronomy.

By dividing the production value by the quantity produced, the nominal price per kilogram of fruit is obtained, which varied between R\$1.00 and R\$3.00 in the years 2010 and 2019, respectively. These prices vary according to the period of sale and suffer from the effects of supply in the market. It was stated by interviewee A that the purchase price, from the Natura company to the cooperative, reached R\$2.20 per kilo and that excluding the costs of maintenance of the cooperative and of production and logistics to reach the processing plant, the amount received by kilogram was around R\$1.80.

Pricing, however, depends on the rules that dictate the market. In the case of the D'Irituia cooperative, large industry established the price paid per kilo, based on its production costs. Tucumã can be considered a product of great social, economic and social importance, however, it is not part of the Minimum Price Guarantee Policy for Sociobiodiversity Products (PGPM-Bio).

According to Conab (2017), the PGPM-Bio aims to promote the protection of the environment and contribute to the reduction of deforestation, as a way to minimize the effects of climate change, even guaranteeing income to populations that have their ways of social organization, which occupy and use territories and natural resources as a condition for their cultural, social, religious, ancestral and economic reproduction, using knowledge, innovations and practices generated and transmitted by tradition. This is justified by the state's production level, which is very low and not enough to meet local demand.

The relationship between the D'Irituia cooperative and the applicant company is governed by a contract that establishes the rules of the relationship between the parties and forms a Dyad, in which the small producers are represented by the cooperative, which is the compromiser, and the the applicant company, the undertaking, which define the quantity, the delivery period of the product and other aspects.

4.3 ANALYSIS OF EVIDENCE OF INCLUSIVE VALUE CHAIN FORMATION

According to the theoretical framework, the development of an inclusive value chain of small rural producers in structured markets using the D'Irituia cooperative as the institution that made the contractual relationship with the company Natura, which enabled the inclusion of producers from of its intervention mediated by this relationship term, which transferred technical and technological knowledge to small producers as a way to expand production, preserve the ecosystem and reduce poverty. Then, the statements were decoded, considering five categories of analysis of these statements, namely: Production and productivity; Product quality; Prevention of the environment; Characteristics of the cooperative and Living Conditions. In each of these categories, some subcategories emerged from the reading of the interviews and the identification of text fragments that expressed the perception of the interviewees about the questions asked by the interviewer.

In the category Production and productivity, aspects such as: commercialization, access to credit, technologies, training and knowledge, costs and labor, storage and logistics, and production capacity were identified as subcategories. In the subcategory Technologies, training and knowledge, fragments of the interviewees' speech were coded, regardless of their situation as a member, director or researcher. Aspects

related to this subcategory had the highest frequency of occurrences, which highlights the importance of these aspects among respondents and which is supported by the study by Das Nair et al. (2020), in which technological innovation stands out as a strategy to increase productivity, have access to information and enter globalized markets. The statements of some interviewees reinforce this perception:

But for sure next year, I think most farmers. We are already going to introduce another piece of information, another line of knowledge for them to start working on this management part. (Int. A, verbal information).

UFRA, through Zezinho, always helps us. Always when we need something, because Zezinho is in there. So José Sebastião Romano, as he is a cooperative member and he is part of UFRA, whenever we needed it, UFRA always opened its doors for us. (Int. B, verbal information).

They [the company Natura] developed the equipment. It's a scythe, actually, only they adapted it for height. And they taught how to cut, how to pull, to avoid accidents. How it was to clean, three months before. In this case, it was six months ago. Six months before the first cleaning, three months before the second cleaning, then when the harvest arrived, everything was fine. (Int. F, verbal information).

The subcategory Costs and labor was the second to receive the highest number of references in the category Production and productivity, in which aspects related to costs were pointed out by Porter (1989) as key factors in the definition of cost competition strategies reduced transport costs, for example. For Neto, Neis, Pereira (2016), to the extent that the value perceived by customers exceeds the value attributed to cost, the company becomes competitive. And if the costs of access to the input decrease due to the increase in production resulting from the company's shared actions with tucumã producers, all members of the product's value chain win. Statements about costs appear in:

Not now, they will carry out the process of removing almonds from the collection with everything, it will greatly reduce the cost for the company itself (...) I am making a heavy investment here today, you will see later. I'm modifying it, because the system that we used to work is not working anymore. We don't have manpower. (Int. A, verbal information).

The subcategory Production capacity expresses the interviewees' speech with aspects related to how to collect the fruit to deliver to the cooperative. There are reports that, if the tucumã tree is not taken care of, it produces fewer bunches and fruits. The company provided training to increase production and improve the quality of the tucumã and thereby improving the income from collecting the fruit. According to Swinnen, Kuijpers (2020), increasing production is in the interest of the company that wants to maintain the continuous flow of inputs and develops actions with producers via cooperatives. These actions, related to this subcategory, are noted in the speech of two cooperative members interviewed:

And at the time he did, there's always a person who has a vision for the future, and he was called crazy. "He's cleaning the tucumã tree so that the mucura can eat it easily, pork and stuff like that. Did you hit your head? Have you gone crazy?", today the crazy person is having a comeback. (Int. A, verbal information).

Because the boy went to take it off for me, when he got here he weighed a hundred kilos and it didn't take a whole day. Half a day, one o'clock he's arriving with a bag and he's going to weigh a hundred kilos. (Int. C, verbal information).

In the Product Quality category, the number of occurrences referring to this category was small (five lines), however, the fundamental role in CVD is highlighted, since the interventions made by the company aim to improve the quality of the product and make the more efficient industrial process, in addition to marketing campaigns, using this differential in the quality of the product produced by small producers in the interior of the Amazon. According to Humphrey, Navas-Alemán (2010), Devaux et al (2018), actions to improve product quality contribute to reducing transaction costs, to the extent that contractual clauses are not questioned by the parties and the quantity of products outside the commercialization standard established by the company.

The reports below, made by the producers, show the importance of guaranteeing the quality of the fruit in the tucumã production process. In this quality assurance process, producers need to have adequate training, which was carried out by the company in the initial stage of approaching the cooperative, at a time when the company was experimenting with tucumã harvested by D'Irituia members.

At first we are doing, we want to do the first step of one to five tons of fruit, and this fruit is not just any fruit. Because the Industry does not make a selection, the only selection that the Industry makes is not wanting the fruit marked, pierced, gnawed. She does not want. (Int. B, verbal information).

It is the collection time to arrive at the cooperative. Because if he harvests two days, it's a sign that he's going to spoil. You have to choose one day and take it the next day. It's no use, for example, the collection will be on Thursday, I'll collect it on Monday, which won't do. It doesn't have that durability. (Int. C, verbal information).

The cooperative member aiming only at profit thought "no, I'm going to buy it" and bought it. At the time there was a problem, we had a complaint. We had a lot of times when the person "look, a product arrived here that is no longer good". (Int. F, verbal information).

There are several challenges for producers in the establishment of control processes and quality standards, which need to be faced by the cooperative as a way of mitigating the problem. This can happen, in part, by training actions to improve the quality of tucumã, by the relationship with the company and other public or private non-profit institutions that work in the training and improvement of agricultural producers. Francesconi, Getnet (2014), Hagwiza, Muradian, Ruben (2016), point out the important role of cooperatives to improve product quality by promoting training and approaching technical schools, colleges and universities.

That fruit they want for oil. And that's why we said now it's time for them to come, because each farmer will make the selection on his property, of the beautiful products, to arrive so that we can handle the processing of this oil. (Int. B, verbal information).

I even made them leave seven bags that couldn't go. This here won't go, because if it's not of good quality, there's no point in going. (...) good quality product. Fulfillment of the contract. If you don't comply with the contract, with the right amount, next year you won't deliver anymore. It's a requirement. (Int. C, verbal information).

There is little evidence in the textual fragments of the interviewees' speeches regarding the number of references to the category Prevention of the environment (only two records). This can be interpreted in two ways: i) that these characteristics are rarely reported in the interviewees' statements; or ii) the structure of the questions in the semi-structured interview must be adjusted for future research, as this is a research

limitation. Swinnen, Kuijpers (2020) state that when production by small producers is done respecting the environment, there is strong interest in the product on the part of the general population and on the part of companies that take advantage of a differentiated resource to insert in their portfolio of products. inputs, this gain is greater if it is produced by small agricultural producers.

The evidence of preservation in the text fragments of the interviewees' speeches, described below, show that there is, on their part, a concern to preserve the environment in which the tucumã trees are located or actions to repair the environment using part of the resources obtained for the sale of the fruit.

Today the management part is only through the cooperative members because there is already a different conscience. (Int. A, verbal information)

I reinvested in cleaning, including in the igapó. I had some cleaning carried out (...) the cooperative received the organic seal, the certification to pass on to the members. Then it will certify the members, the product. (Int. C, verbal information).

According to Humphrey, Navas-Alemán (2010), a strategy to insert rural communities and small agricultural producers at the margins of the market is to be able to implement productive practices that consider the preservation of the environment, via the inclusion of these in the value chain of agricultural products. And one can see, in the excerpts below, the interest of those involved in the implementation of environmental preservation practices.

I think this way, it will help a lot in the reconstitution of the forest itself. (Int. A, verbal information). Until then, it already has... because before, a lot of tucumã was deforested, right? Today you already hear from the mouth of our cooperative members not to deforest the tucumã anymore. (Int. C, verbal information).

And it was good because we were already cleaning them. There, he also mobilized the social part like this. (...) Not today, people don't knock down anymore, they even lift. (Int. D, verbal information).

The evidence given the interviewees' narratives show that there are actions to protect fauna, flora and rivers. These contribute to raising production to the extent that new tucumã plants are preserved, no longer subtracted from the land, and because the land where the plants are located is cleaned, which can help to increase productivity per bunch, as reported by an interviewee. The company that carried out the intervention for CVD transferred knowledge from practical courses on tucumã management and showed the potential of the product.

5 CONCLUSIONS

The main objective of the research was achieved and shows that there is evidence of the formation of an inclusive value chain for Tucumã (*Astrocaryum Vulgare Mart.*) commercialized by the cooperative D'Irituia together with the cosmetics company Natura, governed by a contract in which the characteristics of the processes of production, quality and preservation of the environment are considered.

The survey results show the importance of aspects related to production, environment and product quality. These respond to the problem, also to the defined objective, which was obtained from the

systematization of the statements made by the interviewees and the analysis developed based on authors such as Devaux et al (2018), Donovan, Stoian, Poe (2016), Das Nair et al (2020), Swinnen, Kuijpers (2020). In this sense, it is concluded that the value chain of the tucumã product (*Astrocaryum Vulgare Mart*) becomes more productive as plant management training is carried out, technology transfers were successful, the knowledge produced was disseminated between members and the importance of protecting ecosystems, based on the environmental services provided by small producers who participate in the tucumã chain linked to the delivery of these inputs to the company Natura.

The cooperation and synergy generated between cooperative members, the cooperative and industry, indicates a viable path for the exchange of knowledge and practices related to the cultivation and extraction of different cultures. The relationships established in the value chain enabled the search for standardization of processes, procedures and the mapping of productive areas.

This time, the research demonstrates that both the cooperative and the members were able to obtain results from the sale of tucumã. Such results are not restricted exclusively to the economic aspect, but also to the social aspect, provided by the distribution of employment and income in the activities of collecting and distributing the fruit. Concerning the environmental aspect, this occurs through awareness of the preservation of the forest, the conservation of palm trees and the soil where they are planted.

It can be said that the D'Irituia cooperative plays a central role in the value chain development process, because it was the organization that received the intervention of the large company and started to reorganize itself to meet the demand for a contract for the delivery of tucumã in natura. The cooperative's experiences in transacting other extractive products (murumuru) with Natura, made it possible for it to be included in the tucumã value chain that is under development. There is the prospect of advancing to a stage of verticalization of the tucumã chain, based on the implementation of a processing plant, to extract new products that will guarantee new business for the cooperative and its members, in addition to enabling the inclusion of new members and the hiring of labor, formal and informal, for the collection and selection of the fruit. Whether the cooperative will become more of a community or a market will depend on how the new businesses are organized, considering the financial risks.

Therefore, it is understood that despite the efforts of this research to achieve the objectives and answer the guiding questions, due to the complexity of dealing with elements often considered divergent, such as the market and the socio-environmental, present in this study and its exploratory nature, It is not intended to close here the questions related to the theme. But it does open doors for other researchers, who are also involved in the construction of the research, to continue it, as it brings new elements for progress in the analysis of the value chains of products such as tucumã. Among the possible areas of research interest in the chain of this fruit are: studies to define the size of demand; relational analysis between the links in the chain; stakeholder study; gender studies and risk data; and resilience in the chain.

The limitations of the study are related to the small number of interviewees, only four cooperative members involved in the collection of tucumã, these have been in the company since the cooperative's

founding date, in 2011, until the moment of the research, in 2020. These cases were chosen according to to maintain a balanced gender distribution, since the literature points to the important role of women in Value Chain Development (CVD) interventions, as presented in UNIDO (2013).

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