

Theoretical-empirical Article

Governance and Value Appropriation in the Cocoa Bioeconomy at Amazonas

Governança e Apropriação de Valor na Bioeconomia do Cacau no Amazonas



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ABSTRACT

Objective: this article identifies the mechanisms that guide governance and determine the possibilities of appropriation of value (income) by extractive producers who participate in different value chains of the cocoa bioeconomy in Amazonas. **Theoretical approach:** transaction cost economics, with an emphasis on the relationships between the specific conditions of assets and bargaining power over the appropriation of value, represents the basis for the two theoretical propositions formulated. **Methods:** a qualitative approach to multiple case studies was used in two regions (Madeira and Juruá rivers), which are representative of the value chains of the cocoa bioeconomy in Amazonas. Secondary (documents) and primary (interviews and focus group) data were analyzed using thematic analysis. **Results:** in the commodity and specialty cocoa chains, differentiated relational governance mechanisms have been established, which configure the distribution of bargaining power between intermediaries and producers and consequently the ability of these agents to appropriate value. **Conclusion:** swaying bargaining power in favor of producers depends on the presence of specific assets positioned to their benefit. The higher the level of specific assets involved in the transaction in favor of extractivists, as occurs in the specialty cocoa chain, the greater their bargaining power tends to be and, consequently, their opportunity to appropriate value. Encouraging the creation of value chains based on specific assets that increase producers' ability to appropriate income is imperative to achieve an inclusive bioeconomy in the Amazon.

Keywords: bargaining power; specific assets; governance; appropriation of value.

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Cite as: Trindade, L. X., Saes, M. S. M., Fernandes, J. A. L., & Marcovitch, J. (2024). Governança e apropriação de valor na bioeconomia do cacau no Amazonas. *Revista de Administração Contemporânea*, 28(6), e240184. <https://doi.org/10.1590/1982-7849rac2024240184.en>

RESUMO

Objetivo: o artigo tem como objetivo identificar os mecanismos que regem a governança e determinam as possibilidades de apropriação de valor (renda) por parte dos produtores extrativistas que participam das diferentes cadeias de valor da bioeconomia do cacau no Amazonas. **Marco teórico:** ao abordar a influência da especificidade dos ativos e do poder de barganha no processo de apropriação de valor, a pesquisa se alicerça na economia dos custos de transação para formular duas proposições teóricas. **Métodos:** por meio de um estudo de casos múltiplos, investigou-se a dinâmica de diferentes cadeias de valor da bioeconomia do cacau no Amazonas, estabelecidas em torno dos rios Madeira e Juruá. Foram analisados dados secundários (documentos) e primários (entrevistas e grupo focal) por meio da análise temática. **Resultados:** nas cadeias de cacau commodity e especial são estabelecidos mecanismos diferenciados de governança relacional, que configuram a distribuição de poder de barganha entre intermediários e produtores e, por consequência, a capacidade de apropriação de valor desses agentes. **Conclusão:** o poder de barganha em favor dos produtores depende da presença de ativos específicos posicionados em seu benefício. Quanto maior o nível de ativos específicos envolvidos na transação em favor dos extrativistas, como ocorre na cadeia de cacau especial, maior tende a ser o seu poder de barganha e, por consequência, a sua capacidade de apropriação de valor. Estruturar cadeias de valor baseadas em ativos específicos constitui uma diretriz-chave para o desenvolvimento de uma bioeconomia inclusiva na Amazônia.

Palavras-chave: poder de barganha; ativos específicos; governança; apropriação de valor.

JEL Code: M11, M11, D4

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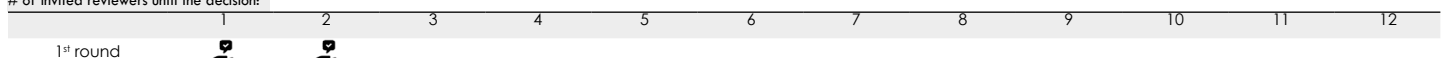
Received: July 15, 2024

Last version received: October 16, 2024

Accepted: October 24, 2024

Published: November 28, 2024

of invited reviewers until the decision:



INTRODUCTION

Bioeconomy is a multidimensional approach under construction, full of disputes and contestations. The most used definitions of bioeconomy were conceived by authors based in the context of the Global (Vivien et al., 2019). More recently, this theme also assumed a high profile in the Amazon agenda, where it seeks to incentivize economic activities able to strengthen local communities, promoting its wellbeing and cultural diversity, prioritizing both people and the preservation of biodiversity present in the biome (Saes et al., 2023).

Equitable distribution of benefits and values compatible with the interests of the populations and communities of the forest who occupy the first links of the value chains is one of the guiding principles of Amazon bioeconomy (Abramovay et al., 2021; Bergamo et al., 2022; Costa et al., 2022; Lima, 2021; Lima & Palme, 2022; Nobre & Nobre, 2018; Saes et al., 2023). Amazon bioeconomy is based on value chains for socio-biodiversity, considering the bases for the generation of opportunities that support the lives and wellbeing of the population of the forest (Abramovay et al., 2021; Lovejoy & Nobre, 2019). But who in fact benefits and who loses in bioeconomy value chains? (Abramovay et al., 2021; Lima, 2021; Lima & Palme, 2022; Lovejoy & Nobre, 2019).

The question is relevant because bioeconomy assumes the commitment to ensure prosperity, compatible with adequate levels of income for the communities of the forest (Bento et al., 2019; Nobre & Nobre, 2018). The equitable distribution of the surpluses and benefits from the commercialization of forest products is a prerequisite for the flourishing of a restorative bioeconomy in the Amazon (Bugge et al., 2016; Lima & Palme, 2022). However, which mechanisms determine the necessary conditions to create a more 'just' or equitable bioeconomy based on forest products? This article makes a theoretical and empirical contribution to describe some of the mechanisms that are capable of creating a more symmetrical and equitable distribution of value in the Amazon Forest's bioeconomy, especially in the value chain of wild cocoa.

The distribution of value becomes relevant in the analysis of the governance of value chains of bioeconomy products. Although socio-biodiversity chains have gained attention with the protagonism of the bioeconomy narrative, these chains have always existed in the Amazon, but nevertheless lack organization and governance, which is an important theme to fix the outcomes of a bioeconomy. On the logic of this concept, the efficiency of a value chain is tied to its capacity to create and sustain value. The success of governance depends on its capacity to sustain the value created and to solve problems of the distribution of value

among the actors in the chain (Caleman & Zylbersztajn, 2012, 2013).

The cocoa value chain is part of the Amazon bioeconomy and is permeated by a notable diversity of demands on the attributes of the product (quantity, quality, and sustainability). It is up to the governance of the chain to attend to these diverse demands, whether they are commodities with low aggregated value and large production volumes or specialty products with more aggregated value and lower production volume. Consequently, there are two main categories of cocoa bean — commodity cocoa and specialty cocoa (fine and aromatic), whose production chains are guided by organizational structures and governance mechanisms with unique characteristics that intervene in the distribution of value between actors. The diversity of demands and the different governance mechanisms establish different possibilities for value appropriation for extractivist producers.

The cocoa chain was chosen because it is representative for studying the theme of value appropriation in the Amazon bioeconomy. The approximately 5.5 million producers spread worldwide appropriate just 4-6% of the total value created in the chain. The intermediate links (middlemen, processing companies, and chocolate manufacturers) receive approximately 24%, and the manufacturers of premium chocolate and retailers appropriate around 70% to 72% of the value created (Abdulsamad et al., 2015). Amid this context, this study seeks to respond to the following problem: How do the governance mechanisms present in the chain of wild cocoa in Amazonas determine the possibilities for appropriation of value for extractivist producers?

This article aims to 'identify the mechanisms that dictate governance and determine the possibilities of value appropriation (income) for extractivists that participate in the different cocoa value chains in Amazonas'. The governance of the value chains of socio-biodiversity products is a central issue for the success of bioeconomy initiatives in the Amazon

The analysis of the governance mechanisms of the segments of this chain contributes to the issue by highlighting the capacity of Amazon bioeconomy products to distribute benefits to the actors working directly in forest conservation. The second part of the article presents transaction cost economics (TCE) as the theoretical basis for the two theoretical propositions formulated. In the third part, the methodology used to respond to the research problem is presented. The fourth section presents the results of the data analysis. In the fifth section the final considerations are described.

GOVERNANCE AND INCOME APPROPRIATION

The value chains represent the organization and coordination of economic activities that allow us to understand the dynamic of creation and appropriation of value between the actors that compete and cooperate for portions of the created value (Horner & Nadvi, 2018). Governance highlights the role of buyers in the formatting, structuring, and organization of value chains, demonstrating the relations of control and coordination in the context of power and authority asymmetries between actors (Gereffi, 1994, 1999; Gereffi et al., 2005; Gereffi & Lee, 2012).

The governance of value chains in the Amazon bioeconomy involves analyzing the coordination of value creation and distribution processes. It is up to governance to be able to reconcile the interests of the different economic actors that represent the links in this organizational structure. The classic approach that analyses the coordination of transactions between buyers and sellers is transaction cost economics (TCE), which argues that efficient coordination is that which minimizes transaction costs without worrying about the distributive issue along the value chain (Williamson, 2002).

Therefore, according to the paradigm of transaction cost theory, firms must align their governance structures (such as markets, hierarchies, or hybrid forms) with the characteristics of the transactions in order to minimize transaction costs and thus maximize economic efficiency. The more specific the assets¹ necessary to carry out a transaction (in other words, what cannot be easily used for other ends), the greater the risk of opportunistic behavior and contract breaking. In the market, the incentives are strong, they are proportioned by the gains associated with a successful transaction, and the controls are weak. In the hierarchy, the incentives are weak (since the benefits are not strongly correlated with the performance of actors), but the controls are strong. The hybrid forms combine different proportions of incentives and controls (Williamson, 1985, 1996; see an empirical example in Souza & Miranda, 2019).

In this approach, the emphasis on transaction emerges with Coase (1993), which considers transactions to be essential in order to take advantage of the division of labor and the specialization of activities. The so-called 'discriminating alignment principle' predicts that, in a competitive environment, decision-makers will have incentives to adopt the governance structure with the lowest possible transaction cost; otherwise, firms

expose themselves to the risk of being expelled from the production and exchange process (Saes, 2008).

Beyond the Pareto logic² of the TCE model, Kim e Mahoney (2007) call attention to the fact that the system of market price does not inevitably lead to economically efficient results due to political dynamics and imperfections in the application of property rights by third parties. In this sense, the constitution of property rights depends on path-dependence, which is defined by the political, social, and economic interests that exist in the environment surrounding the contracting parties (Libecap, 1986). For this reason, the history of the institutional trajectory matters, and the evolution of property rights is not necessarily an efficient process (Kim & Mahoney, 2007).

Given an expected division of economic rents *ex ante*, rational actors will analyze whether the division of economic rents is in fact acceptable *ex post* when deciding to supply the factor input (see, for example, the experiment carried out by Mesquita et al., 2021). However, there is 'incomplete contracting in its entirety' (Menard et al., 2014; Williamson, 1985; Schnaider et al., 2022), especially since suppliers of factor inputs are often not fully compensated for the costs incurred in producing these inputs, which ultimately contribute to the company's economic rents. This logic leads us to consider a critical aspect of the generation of economic rents: the combinations of resources that potentially generate rents may not be realized due to transaction costs, broadly defined *à la* North (1990). A ECT (Williamson, 1985, 1996) and modern property rights theory (Hart & Moore, 1990) do not explicitly focus on the possible gap between potential economic value and realized economic value.

Under the traditional approach, the quasi-income is defined as the difference between the internal value (best use) and the alternative value (loss of use). Being a subtraction operation, the value assigned to the alternative is inseparable from the calculation of the surplus. But in the logic of bargaining, the value of the alternative option is only one of the parameters of the negotiation. The division of value depends on both the value of the alternative option and the proposals made by other agents and their own alternatives (Lippman & Rumelt, 2003). If the asset has low specificity (commodity) and the markets are incomplete (lack of sales alternatives and access to information), we can infer the following proposition:

Proposition 1: When the transaction between buyer and supplier of a commodity takes place in an incomplete market context (lack of infrastructure, logistics and information or access to the market), it is expected that the appropriation of income will be favorable to the buyers. The asymmetry of power and the limited existence of sales alternatives reinforce this dependence, allowing buyers to capture a greater share of the value generated.

On the other hand, the theory suggests that the less substitutable part (producers with specific dedicated assets) has a stronger negotiating position, being able to demand better terms in transactions. The specificity of assets increases the cost of substituting producers, giving them greater bargaining power. Therefore, we can infer the following proposition:

Proposition 2: When producers or communities have specific assets, they acquire greater bargaining power in their transactions with buyers (middlemen

or processing companies), even when these buyers have wider market access. Specific assets increase the possibility for value appropriation by producers.

Figure 1 illustrates the propositions in a schematic form. The dotted lines in black represent the interval of negotiation between the commodity producers and middlemen. The maximum price to be received is paid for the commodity on the market. Due to the difficulty of accessing the market, the middlemen have advantages in negotiation to define this price. The second-best alternative for commodity producers is to let the product rot on the plant, resulting in a price of zero. The dotted red lines show the negotiation between producers of specific products (specialty), whose second-best alternative is the commodity price, which guarantees them better bargaining conditions. In the case that the product does not receive the premium price, the producers have the option to direct their sales to the commodity market³.

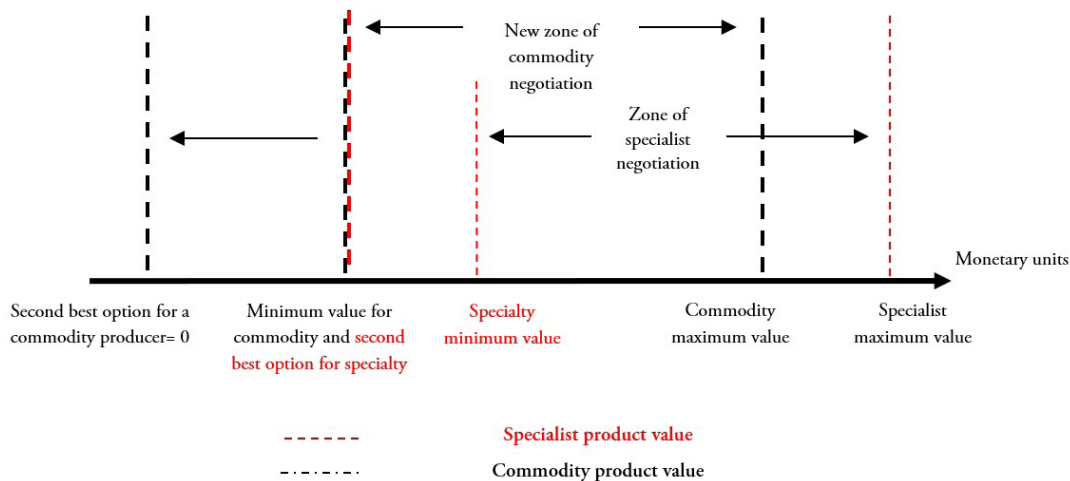


Figure 1. Negotiation between buyer and supplier of commodities and specialty goods.

Source: Based on Raiffa, H. (1996). *El Arte y la Ciencia de la Negociación*. Fondo de Cultura Económica e Saes, M. S. M. (2008). *Estratégias de diferenciação e apropriação da quase-renda na agricultura: A produção de pequena escala* [Tese Livre Docente]. Universidade de São Paulo.

METHODOLOGY

In line with the proposed objective, the research was guided by a qualitative approach (Creswell & Clark, 2013), seeking to produce holistic and particular explanations from a multiple case study (Piekkari et al., 2009). The chosen cases were two regions in the state of Amazonas, highlighted in the red circles in Figure 2: the Madeira River and the Juruá

River. The regions are representative that can respond to the research problem and at the same time are contrasting cases with diametrically opposed characteristics and extremes, where the process of interest is easily verifiable, allowing the observation of contrasting standards in the data (Eisenhardt, 1989).

The first case is represented by the value chain of cocoa originating from four riverside extractivist communities

located in the municipality of Novo Aripuaná, on the fringes of a state conservation unit — the Madeira River Sustainable Development Reserve (RDS Rio Madeira), managed by the state government, created in 2006 and that spans 283,117 hectares. The RDS is subdivided into forty communities located in the municipalities of Borba, Novo Aripuaná, and Manicoré. In this region, there are two segments of the cocoa value chain (commodity and specialty) in coexistence, with the commodity chain dominating. The

second case study is the Juruá River region, situated around 2050 km from the first case. The research was carried out in the Guajará municipality, specifically in the Novo Horizonte community. In this location, the specialty cocoa value chain is in its development phases. It is a region where the extractivist community was unaware until recently of the economic value of cocoa and only began to develop capabilities to participate in the value chain in 2017.

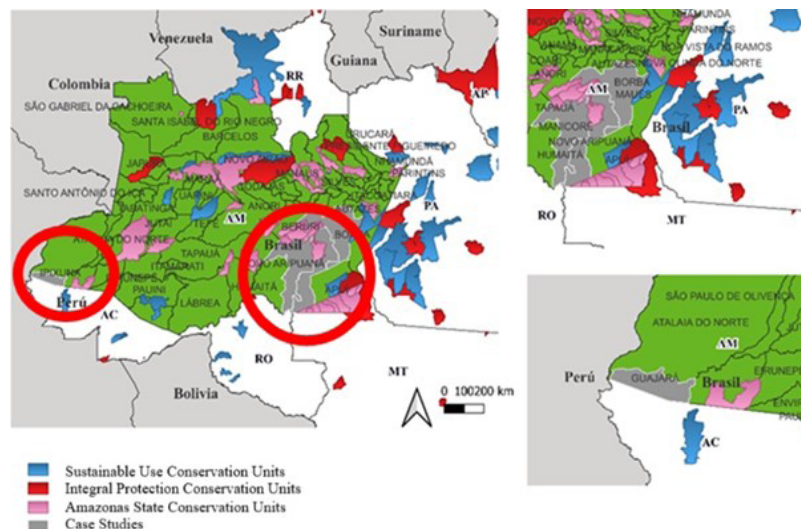


Figure 2. Location of the municipalities of the case studies.

Source: Elaborated by authors.

A variety of primary and secondary data collection techniques were employed. In the documental research, documents were gathered on different occasions between April 2021 and October 2022. These secondary data correspond to the analysis of 23 documents that added up to 617 pages of files, such as reports and bulletins, publications and specialist studies, newspaper articles, and public or available documents. The primary data refer to field research conducted between January and October 2022. Twenty-four semi-structured interviews were carried out, as were consultations of a number of economic and non-economic actors involved in the Amazonas cocoa value chain, all representative and key respondents for the research. The interviews totaled 840 minutes of audio and video recorded and transcribed. The participants in the research were extractivists, cocoa buyers, chocolate manufacturers, and public institutions of state, federal, and non-governmental support. All of the meetings were carried out in the following ways: (a) over the internet using Zoom Meeting®;

(b) through field research with a duration of 14 days, carried out in October 2022, with the communities of RDS Rio Madeira, in the municipality of Novo Aripuaná, and with the Novo Horizonte community, in the municipality of Guajará, both in Amazonas.

Preceding the interviews, a focus group was carried out on February 22, 2022 with the participation of representatives of chocolate manufacturers, public authorities, and non-governmental organizations. The focus group session was carried out online, mediated and recorded by the first author through the Zoom Meeting® platform. The central question posed to the participants was: What are the possibilities for creating and appropriating value for the communities that participate in the cocoa value chain in Amazonas? The focus group allowed a freer and less led discussion between the participants. The session totaled 121 minutes of video recording, transcribed for analysis.

The data were analyzed with the help of a qualitative analysis software (Atlas.ti 22®). Through thematic analysis (TA), we were able to deeply understand the attribution of meanings, sense, and identification of themes through the experiences related by research participants and present in the documents analyzed. The codification, according to the technique of thematic analysis, comprises a recursive process of six sequential non-linear stages: (a) familiarity

with the data; (b) initial generation of codes; (c) generation of themes; (d) revision of potential themes; (e) definition of themes; (f) drafting of final text (Braun & Clarke, 2006, 2012; 2017). This way, the research identified the themes and subthemes associated with the mechanisms of governance in the segments of the cocoa value chain in Amazonas in the regions studied, which are highlighted in Table 1 and discussed in the sections below.

Table 1. Themes and subthemes highlighted in the case studies.

Case (region)	Themes	Subthemes (Contents)
Rio Madeira (commodity cocoa)	Governance 'almost bartering'	Asset specificity: low; quasi-barter relationships; trust relationships based on reputation sustained by welfare; transaction cost: welfare 'institution of the advance.' Incentive: nil
	Levels of intermediation and value appropriation	Local and foreign intermediation; intermediaries' strategy; extractivists as price takers; value capture action; asymmetric transactions.
Rio Madeira (specialty cocoa)	Relational governance	Asset specificity; intermediary; joint vertical action, cooperation relations based on trust and reputation; transaction cost: 'institution of the advance' with guarantor; incentive; premium for quality (price); frequency of transactions.
	Levels of intermediation and value appropriation	Levels of suppliers (direct and indirect suppliers), extractivists as price takers; more symmetrical exchanges (equanimous).
Rio Juruá (specialty cocoa)	Relational governance	Asset specificity: high; vertical joint actions, cooperative relationships based on trust and reputation; transaction cost: 'institution of the advance' in the form of an investment. Incentive: premium for quality (price).
	Levels of intermediation and value appropriation	Intermediation and coordination levels; informational symmetry within the community; external informational asymmetry; price negotiating communities; more symmetrical (equitable) exchanges.

Note. Elaborated by authors.

THE SEGMENTS OF THE COCOA VALUE CHAIN

Brazil is the fifth largest cocoa producer in the world, with an average of 269,000 tons produced between 2018 and 2022. In the same period, the Amazon biome was responsible for 52% of national production, with Amazonas accounting for an average of just 674 tons per year (equivalent to 0.25%) (Instituto Brasileiro de Geografia e Estatística [IBGE], 2023). In Amazonas, cocoa is found predominantly in the floodplains of rivers, in areas of common use such as sustainable development reserves (RDS), and is characterized as wild cocoa.

Cocoa value chains are configured to meet different demand profiles: commodity cocoa and specialty cocoa (Abdulsamad et al., 2015; Middendorp et al., 2020). In the commodity segment, individual producers generally

sell their product to local intermediaries who have advantages over small producers who have little access to information (Jano & Hueth, 2013). The structure of this market is oligopsonic, based on thousands of producers who have only the three global processing companies as sales options, with the ability to indirectly influence the agricultural segment, establishing a form of meso-level governance (Neilson et al., 2018; Ponte & Sturgeon, 2014). The specialty cocoa chain represents around 5% to 10% of the global market. Specialty (fine or aroma) cocoa has a complex flavor and aroma profile that reflects the expertise and terroir of the environment in which it was grown and primarily processed. This type of cocoa also has important genetic diversity, historical and cultural heritage (International Cocoa Organization (Organização Internacional do Cacau, 2018).

Quasi-bartering governance in the commodity cocoa chain in the Madeira River

The territory of the Madeira River Sustainable Development Reserve (RDS) is part of the commodity segment of the cocoa chain, led by companies that operate as global buyers of raw materials. These companies have an indirect relationship with the extractive producers through two intermediaries: (a) the local ones, who are residents of the community or live close to them; (b) the national buyers, who are external and sell the extractive production to other intermediaries or directly to the processing companies. The relationships between these agents are characterized as hybrid relational governance

The transaction involves a product with the intrinsic characteristics of an asset with low specificity (commodity), in which governance between intermediaries and producers could be confined to the market and determined by price. However, due to locational specificity and the difficulty of accessing the market, governance becomes more complex. This cocoa chain is permeated by transactions between intermediaries and extractive producers based on interpersonal relationships between the parties.

This relationship is based on a number of mechanisms that go beyond price. Transactions are carried out on the basis of frequent and complex relationships of the quasi-barter type, with the characteristics of a surplus economy. The surplus is due to the fact that cocoa extraction producers have surplus factors of production (land, labor force, and means of work) and, most of the time, an important part of their food comes from forest resources, outside of monetary relations (Martins, 1975). The quasi-barter transaction implies the existence of interpersonal relationships: the transactions established between suppliers and buyers are based on the reputation and trust that are built up between the parties over time (Gereffi et al., 2005).

... we know them well. We trust them and they trust us. Sometimes I buy a bit of merchandise there. 'Mate, I'm going to pay you in cocoa.' I come here. If he doesn't trust me, he won't let me, but if he does, they let me ... (interviewed extractive producer).

At the heart of these relationships is the price, but above all the existence of a mechanism that is characterized as a kind of 'institution of advance payment,' which acts strongly in transactions with outside intermediaries (national transfer agents) who buy the product in advance by advancing funds to the extractivist in order to ensure the supply of the product during the harvest period. Culturally, due to the material needs of the extractivists, cocoa purchase and sale transactions are carried out on the basis of advance

payments from the 'national transfer agents.' Furthermore, the 'institution of the advance payment' represents a transaction cost incurred by intermediaries when they establish relationships with suppliers, in order to encourage cooperative ties, which are actually ties of dependence (Williamson, 1981, 1985), which mediate the relationship to the detriment of the price.

A second form of transaction is an exchange with characteristics similar to barter. National smugglers are often the link between rural and urban areas, between extractivists and the city and its markets. These agents transport a variety of products on their boats, which can be basic necessities, such as food, or more valuable goods. These products are sold or exchanged for wild cacao from the extractivist communities. In this almost barter-like practice, there is generally no price equivalence. As a result, the extractivist takes on a debt to be fulfilled in the following harvest or supplements the debt with money. They are therefore asymmetrical exchanges.

This type of relationship materializes from the socioeconomic vulnerability of the extractivists, which is expressed in the existence of basic material needs and their condition of isolation, which prevents them from accessing the market as sellers and buyers under normal conditions. Logistics and means of communication constitute a second cause of extractivists' vulnerability to the actions of intermediaries: information asymmetry. The condition of isolation prevents producers from having access to the information they need to carry out transactions without the risk of possible self-interested and opportunistic behavior on the part of intermediaries.

There is a high level of dependency on the part of the extractivist on the national buyer. This dependence is fed by the vulnerability of this agent, who has few sales options. Although intermediaries reproduce in the midst of dependency, they play an important role in the chain by occupying and acting in market voids. There is really only one option for the extractivist: asymmetrical transactions, between having no sales options or trading on the basis of an unbalanced price.

... the middleman often ends up being the lesser evil, because the riverside community ..., they don't have the chain, sometimes they can't even make a connection, they don't have a boat, they don't have anything, so they just harvest. It's what I say: between having five reais or having nothing, he prefers to have the five reais, and he ends up being exploited, that's the truth (CMP02).

The buying and selling of commodity cocoa in Amazonas are not a transaction predominantly determined by price, but is mainly based on the dependence, trust,

and mutual reputation built up from the frequency of transactions and the role played by the intermediary in guaranteeing the subsistence of extractivist family nuclei.

Levels of intermediation and value appropriation in the commodity chain: Asymmetrical exchanges

The external intermediaries ('national buyers') represent the link between the communities and the cocoa processing companies. The 'national buyers' are located in the urban areas of the main cocoa-producing regions of Amazonas, such as the tributaries of the Madeira River. The link between the national buyer and the communities are the local intermediaries of the communities themselves. Thus, the buyers are made up of traders from the communities themselves. In this segment of the value chain, there are two levels of intermediation between the extractivists and the global processing company.

... there is this buyer for the big national buyers; they have their 'compadres' in the communities who are supplied with money and who, for example, if the wife of the comrade there, the producer, gets sick or is going to 'give birth,' she goes to the city and when she gets there she looks for the buyer and he pays for everything, and there he already pays with the cocoa that is being produced there, [the producer] has already made that commitment to deliver the cocoa to the buyer (representative of state authorities).

The first transaction in the chain takes place between the extractivists and the local intermediary. Predominantly, the extractivists sell their product as fruit or beans, without primary processing, as they don't have the infrastructure. Local buyers usually have a processing plant and buy the cocoa fruit from the community's extractivists in order to process it and resell it to 'national resellers.' Another form of action consists of the transfer agents maintaining strategic points in the community. These points are maintained with financial resources or basic necessities managed by local traders, and it is there that the extractivists sell their products. There aren't many options for extractivists to escape these points of sale for basic necessities in the communities, due to the distance or the cost of travelling to urban areas.

... the middleman already leaves the resource in the hands of the trader, knowing that the community will not run away from that strategic point, that we become submissive to this market (representative of an association of extractive producers).

Who determines the price practiced in the communities in this transaction is the figure of the 'national buyer,' who, although based on the daily stock exchange price, offers lower prices. There is no room for negotiation in this transaction: the extractivist assumes the position of price taker in a condition where the extractivist's relationship of dependence and trust in relation to the buyer contributes to his loss of value margin. The forest producer therefore suffers from value capture in the chain by agents who do not create value directly. Relational governance in the cocoa commodity chain on the Madeira River is a typical case in which dependence, trust, and reputation do not have positive effects for extractivists, but jeopardize their ability to sustain themselves in the chain.

Price formation and value appropriation also have a relationship between the global and the local, with emphasis on elements such as the variation in international cocoa price quotations and the international currency itself, aspects that most extractivists are not aware of. As well as highlighting the existence of geographically distant power structures, these elements show how these structures reinforce and help perpetuate inequality throughout the chain.

Relational governance in the specialty cocoa chain in the Madeira River

In the Madeira River region, there are movements to structure the specialty cocoa chain, led by two fine chocolate manufacturers in Manaus (CMP01 and CMP02). The inadequate skills of extractive producers to deliver a specialty product and the structural deficiencies supporting the chain in Amazonas require direct intervention by companies in the development of the chain, through joint vertical actions facilitated by the construction of a relational type of hybrid governance.

Chocolate manufacturing companies have different levels of demand for quality attributes linked to their production processes. These attributes are intrinsic (aroma, color, texture, and flavor) and extrinsic (organic). While the intrinsic attributes depend on the proper selection of healthy, ripe fruit and a primary collection and processing process (fermentation and drying), the extrinsic attribute is linked to the existence of guaranteeing certifications.

Complying with these stages does not ensure that the final product has the attributes required by the companies. While CMP01 considers cocoa that has been properly processed (fermented and dried) to be of the highest quality and suitable for its products, which are aimed at the domestic market, CMP02 is looking for cocoa that is considered fine, which is difficult to find in the region. The specialty cocoa segment present on the Madeira River gives

rise to an asset with an intermediate level of specificity resulting from the primary processing of the product.

The quality required demands governance that facilitates producer learning in the processes of handling and processing cocoa beans. The transaction of buying and selling specialty cocoa is based on relational governance, which presupposes the building of reputation and trust between the parties involved in the transaction. Relationship building represents the main transaction cost of this transaction. The mechanisms for training and monitoring producers facilitate relationship building between companies and producers. On the other hand, these mechanisms are also transaction costs that are incurred to encourage producer cooperation.

There is a high level of risk aversion on the part of extractivists, most of whom are not predisposed to making adaptive efforts to improve the product and ultimately are not properly rewarded by buyers. This risk stems from the high level of uncertainty and translates into a lack of trust. Building this relationship in the midst of long-lasting and stable relationships of trust, such as those established between intermediaries and extractivists in the commodity chain, is a challenge for companies in the specialty segment, given the difficulty of convincing extractive producers to make the decision to exchange a stable relationship in the commodity chain for another with no reputation history.

The specialty cocoa segment has also associated itself with the 'institution of advance payment' in order to promote the engagement of producers in the chain. The rooting of this mechanism has implied the reproduction of a similar approach in the commodity chain. The actions of middlemen in the commodity chain can represent a risk to the supply of the specialty chain. The actions of companies in the specialty cocoa segment suggest that the market needs to adapt to the local dynamics that predominate in extractive transactions. This organizational adaptation represents a significant transaction cost incurred to encourage cooperation.

... [the relationship] became stronger when we advanced resources now. Every year we have to advance resources to them, because otherwise the middleman goes there and buys the cocoa in advance and we don't buy cocoa, even though the middleman pays 70%, 80% cheaper than we do today, but he [the extractivist] needs money in December ... (CMP01).

Transactions in the specialty cocoa chain based on advances also operate informally. There is no formal contract guaranteeing rights and duties between the parties. The guarantee of this transaction is based on trust that is established between the parties over time.

Frequent transactions, accompanied by the fulfillment of the promise to pay a bonus on the price of special cocoa, contribute to building the relationship. The bonus was an important differentiating element in establishing the relationship with the extractivists.

It would not be enough to guarantee the transaction once or a few times; the reputation and stability of the relationship depend on sustaining and repeating the transaction on a regular basis over time. The fulfillment of transactions and the superior price agreement favors the establishment of trust and rapport between the parties, which allows for the assisted development of suppliers, who have become more willing to modify their traditional practices and improve their product. The governance challenge lies in building mechanisms that provide sufficient incentives to adapt the region's cocoa to the parameters of intrinsic and extrinsic attributes.

Levels of intermediation and value appropriation: More symmetrical exchanges

In the Madeira River specialty cocoa sector, the appropriation of value takes the form of a mechanism designed by CMP01, which relates directly to the producers. The relationship between the company and the producers, however, takes place through two levels of suppliers. Level I suppliers are extractivists who have primary infrastructure, master the cocoa processing process and are certified. Level II suppliers are extractivists who do not have a minimum scale of production, do not master the processes or do not have the processing infrastructure.

... we have two types of producers. There's a producer who has already mastered the technique of cutting and harvesting, and there's the producer who is his neighbor who hasn't mastered it yet and who has a very small production ... We have levels of producers, direct and indirect, and we have a direct relationship with all of them, we supervise all of them, and there's no middleman, no (CMP01).

Level II suppliers sell their product in the form of selected, unprocessed fruit to Level I suppliers, who in turn sell directly to the buying company. In this relationship, although there is no traditional middleman, there are extractivists who are direct and indirect suppliers. The Tier I supplier adds value to the Tier II supplier's product by carrying out the primary processing of the cocoa before reselling it. In these transactions, the price of cocoa received by the Tier II supplier is slightly higher than that practiced by the intermediary in the commodity segment.

Meeting the cocoa quality specifications demanded by buyers depends on suppliers improving their processes

and therefore requires a higher reward. In the specialty cocoa chain, CMP01 rewards producers with a price bonus equivalent to an additional 70% to 100% on the price of commodity cocoa.

... the middlemen pay between seven and ten reais here, while another company that also operates here in the region was paying eighteen reais, but for processed cocoa, which is practically double what the middlemen pay (ONG01).

At the start of operations, the price of cocoa beans was defined based on quality parameters. There were three categories of cocoa quality (types I, II, and III), which determined the price received. This system generated mistrust among producers, despite the fact that the three price levels were higher than those practiced by the region's middlemen. More recently, CMP01 started to establish a single price, which remains at the same level throughout the harvest, while the price of intermediaries fluctuates throughout the period as a result of the daily quotation. However, producers are still price takers in this relationship.

Relational governance in the specialist cocoa chain on the Juruá River

Cocoa producers in municipality of Guajará in the Juruá River region began to insert themselves into the chain in 2017, facilitated by a non-governmental organization. Previously, the community did not recognize the fruit as a basic economic product. The value chain in the region is led by a fine chocolate manufacturer from São Paulo (CMP03) that prospects varieties that allow the development of product lines based on unique origins in the Amazon, where unique quality characteristics are found.

Cocoa from the Juruá River is considered an emblematic origin of cocoa, and is considered an heirloom due to its organoleptic value (aroma, flavor, color, texture, etc.). The biodiversity of cocoa from the Juruá represents an important source of value creation for the purchasing company. The specificities of the region of occurrence (origin) and the primary processing are the bases for the quality of the raw material used by CMP03, which make cocoa from the Juruá River a highly specific asset. Recently, cocoa of this origin was scientifically recognized as belonging to a new species, *Theobroma globosum* (Colli-Silva, 2024). The discovery has significant value for the genetics and biodiversity of the Amazon, but its economic value is still unknown.

By prospecting for origins for its cocoa, CMP03 has also begun to establish relational governance with producers. There was no history of prior relationships

between producers and intermediaries on the Juruá River, which does not imply that there was no uncertainty among producers. On the contrary, the beginning of the chain's structuring was permeated by producers who were unaware of the real potential of cocoa as a source of income. This uncertainty was overcome by supporting the producers in the development of management and processing in order to ensure that the raw materials meet the desired standards. Since then, the company frequently monitors the community's well-being.

... [CMP03] comes once a year to see how the facilities are, if they need to make any improvements, anything, expansions. They are concerned about knowing how the producer is doing at the end, if any changes are needed, if they need some study, something they need, if they need to bring some professional or speak to the agent from NGO2 (ONG02)

The basis of this relationship are the mechanisms for monitoring the extractivists. The production and sale of cocoa, as it was previously unknown, required assistance and partnership between the company and a non-governmental organization for the development of the community, following very specific steps guided by recommendations from the purchasing company. These characteristics make the knowledge and know-how associated with production in Juruá much more tacit and difficult to codify and further accentuate the specificity of the asset.

The history of the relationship from the initial stages of structuring the community supports the bond of trust established between the company and the community and ensures compliance with quality parameters. The frequency of the relationships allows the parties to get to know each other. Most extractivists know the main representatives of CMP03, and the frequency of contact reinforces reputation and trust. In this relationship, there is also the 'institution of the advance' but with some differences. The advance is not intended to provide assistance to guarantee the immediate subsistence of the extractivists in exchange for their future production or to mitigate uncertainty, but rather to make the activity viable in the community.

The advance payment may be made to finance part of the producers' investment needs. To some extent, the cost of the investment is partially absorbed by CMP03 and partially by the community and discounted from the price of the product. The second type of advance payment is mandatory every year at the beginning of the harvest. This resource is made available to two community leaders, who have assumed the role of local coordinators for purchasing and processing the product. CMP03 advances resources

to an extractive community in the confidence that it will receive future production, thus establishing a relational contract.

Levels of intermediation and value appropriation: More symmetrical exchanges

The relationship established with the purchasing company (CMP03) was built and sustained by compliance with transaction agreements. Since the community's first experience in collecting and processing cocoa, the company signed an agreement to purchase the entire crop. In this first purchasing experience, the quality of the product allowed a price agreement to be reached that was considered adequate by the parties and that in 2022 was 50% higher than the first price in 2018.

Transactions occur between the company and the community of producers. However, there are two levels of coordination in this relationship. The first level is established between the extractivists and two local extractivist leaders who coordinate activities in the community. The second level is established between these actors and the purchasing company. Although prices are negotiated annually at the second level, the purchasing company still holds greater bargaining power. However, there is still a perception among the extractivists that the price remains at a sustainable level.

... the price is more or less what [CMP03] says and what we say. They give us their point of view so we can adjust it here, but we also go there and negotiate (AGECJ02).

At the first level of coordination, the extractivists sell their production to local coordinators. A fixed price is assigned per unit of selected fruit. Transactions mediated exclusively in cash and paid in full are decisive for the engagement of the extractivists and for the sustainability of the chain in the community. As in the Madeira River specialty cocoa chain, the local coordinators add value to the cocoa by carrying out the primary processing, also assuming the risk for this stage of the operation.

First-level exchanges are mediated by trust and guarantee of payment between producers. This trust benefits from transparency regarding knowledge of the final price by all parties involved. At this level, there is no information asymmetry; the extractivists are aware of the value received by the leaders who coordinate the purchase and processing of the product. There is also a declared concern to maintain a balanced level between the price per unit of fruit paid to the extractivists and the price per kilo of processed cocoa beans received by the final link between the community and the purchasing company.

There is concern about the level of value distribution in the community, which denotes the existence of a pattern of exchanges that tend to be more symmetrical. However, the levels of extractivists can also mean a risk of socioeconomic stratification in the community, which can be nurtured according to the position and income appropriation capacity of the extractivists in the chain.

... in all the meetings the value is presented, it's not a hidden thing, it's represented to everyone. They know how much the fruit is, they sell it, even ... (interviewed extractivist).

At the second level, local coordinators focus on processing. After the harvest period, these agents send the annual production to the purchasing company. After receiving the product, the chocolate manufacturer discounts the advances and sends the surplus (profit) to the two local coordinators. The reputational history based on compliance with successive agreements and the frequency of transactions supports this relational contract that is nourished by reciprocity and trust in the conduct of both parties.

OPPORTUNITIES FOR VALUE APPROPRIATION IN THE COCOA BIOECONOMY IN AMAZONAS

The typical governance arrangement for the cocoa value chain in the Madeira and Juruá rivers is hybrid. This arrangement is called a relational contract, in which the relationship between buyers and producers occurs based on a shared understanding between the parties, without the need for legal ties (formal contract), but based on reputational/social ties. Given that transactions are repeated with the same partners, the agreements are tacit. In the case of both commodity and specialty cocoa, the relationship occurs through intermediaries, but with different characteristics. In both cases, intermediaries play a central role in facilitating producers' access to the market, because the producers are located in regions without infrastructure and with little information about the market.

In both cases (Juruá and Madeira), there are specific assets that support the opportunity to increase value appropriation by intermediaries or producers. In both cases, the locational specificity of the asset (geographical location of extractive production) reflects market incompleteness. Producers face significant barriers to accessing markets, such as high transportation costs, communication difficulties, and lack of information on market prices. These barriers result in an inefficient distribution of products and resources, leading to suboptimal allocation

and a possible loss of economic value. Lack of market access can be considered a form of locational specificity, as it refers to characteristics of an asset or resource that are specific to a particular geographic location, making them less substitutable and creating specific dependencies between economic agents. Market incompleteness increases the vulnerability of producers and their dependence on intermediaries, who have better access to information on market prices, demand, and other economic conditions, while producers, especially in remote areas, have limited information. Furthermore, due to the need for different goods, intermediaries end up selling products to extractive producers, establishing cocoa sales that are characterized by a historical quasi-barter relationship.

In contrast, in the specialty cocoa value chain there are specific assets that tend to increase the bargaining power of extractive producers. Investment in dedicated assets (primary processing facilities) is made to meet the specific demand of companies that purchase specialty cocoa. Dedicated assets arise when a supplier makes an investment that would not be made if not to meet a particular demand from a customer and, in the absence of this investment, the transaction would be unfeasible (Williamson, 1985). In addition, specialty cocoa producers develop specific knowledge associated with the processes of handling, selection, and control of primary processing (temperature, time and fermentation tests, drying, humidity, and quality attributes) that add value to the product and are not found among producers specialized in commodity production. This knowledge gives specialty cocoa a production

associated with a specific type of human capital (producer specialization), developed through training experiences and in practice (learning by doing). In the Juruá River value chain, location also assumes a differentiating characteristic linked to the specificity of the place where cocoa occurs. Origin represents an attribute valued by the purchasing company, which associates the final product with its terroir, which gives the cocoa superior organoleptic characteristics (aroma and flavor). This set of specific assets has its value increased in the context of specific transactions involving specialty cocoa, making it difficult for producers to be replaced by intermediaries.

Table 2 presents the relationship between asset specificity and value appropriation in the value chains of the cocoa bioeconomy in Amazonas. The governance structure between producer and commodity buyers is hybrid (relational contract), in which the buyer has access to the market, creating greater dependence on producers, according to Proposition 1. If they stop selling the product, given the difficulty of replacing buyers, the second-best option is to let the product perish on the plant (Figure 1). In the governance structure of specialty cocoa, in turn, despite being hybrid (relational contract), buyers have less bargaining power compared to the previous case, due to the existence of other categories of specific assets that confer greater bargaining power and more favorable possibilities of value appropriation for producers, according to Proposition 2.

Table 2. Relationship between asset specificity and value appropriation.

Cocoa chain	Asset specificity	Bargaining power		Governance structure	Possibility of value appropriation by producers
		Producer	Intermediary/purchasing company		
Commodity	Locational (access to the market)	-	+	Relational contract with quasi-bartering mechanisms	Null
Specialist	Locational (access to the market)	-	+	Relational contract, with shared investment in specific assets	Greater than zero
	Locational (Juruá origin/terroir)	+	-		
	Dedicated (infrastructure for processing)	+	-		
	Specialization of human capital (productive specialization)	+	-		

Note. Elaborated by authors.

Both cases (regions of the Madeira and Juruá rivers) have locational asset specificity that provides greater bargaining power to intermediaries. However, in the

specialty cocoa value chain, there are other categories of asset specificity (locational, dedicated, and human capital) that give the extractive producer greater bargaining power

and, consequently, greater possibility of appropriating value. The power asymmetries between the actors are highlighted in the literature on governance (Gereffi, 1994; Gereffi et al., 2005). The cases addressed in the cocoa value chain in Amazonas depend on the specificity of the relationship of the assets involved in the transactions for the benefit of each of the actors in the chain.

The higher the level of specific assets involved in the transaction in favor of extractivists, as occurs in the specialty cocoa chain, the greater their bargaining power tends to be, as are their opportunities to appropriate value. Their chances of being replaced are also lower. On the other hand, as discussed by Williamson (1991), specific assets increase exit costs for producers. Specific assets also cannot be reused without losing their value. These assets would not find an allocation or would lose value if allocated to an activity other than the specific one for which they were initially applied. The value of these assets also depends on the continuity of the transaction to which they are associated. For example, in a commodity cocoa transaction, the assets used for the production of specialty cocoa would not find an allocation or would suffer a large loss of value if applied to these transactions (Fiani, 2011). However, the transaction in the commodity chain would be the second-best option for producers (Figure 1). Therefore, if buyers do not offer prices that compensate for specific investments, producers can sell on the commodity market and will not incur production costs for specialty cocoa in the following harvest. This opportunity means that specialty producers have greater capacity to set prices (bargaining power)..

Investment in specific assets is linked to a risk of non-continuity over time of the transaction to which they are associated. In the event of discontinuation, the cost of investing in these assets is unrecoverable, as they lose their value in the absence of the specific transaction (Farina et al., 1997). The value of assets linked to specialty cocoa depends on the existence of long-term contracts. When there is shared investment in specific assets, the parties involved establish an exclusive or nearly exclusive relationship. The cases described linked to the specialty cocoa chain in Amazonas show investments in specific assets made jointly or facilitated by purchasing companies in order to have their specific demands met. In these cases, shared investment in specific assets can reduce the risk of opportunistic behavior by one of the parties due to the risk of discontinuation of the transaction and loss of the investment made (Fiani, 2002).

FINAL CONSIDERATIONS

The article aimed to ‘identify the mechanisms that guide governance and determine the possibilities of value appropriation (income) by extractive producers participating in the different value chains of the cocoa bioeconomy in Amazonas’. Based on a study of contrasting cases, it was found that the relational governance mechanisms present in the commodity and specialty cocoa chains have different characteristics. Although both operate with the presence of intermediary agents who engage with extractive producers through tacit agreements supported by the reputation of the parties involved, the way in which some elements modify the conditions of balance of bargaining power between intermediaries and producers was observed. This significantly conditions the possibilities of value appropriation between actors.

One of the main elements that determine the observed differences lies in the specificity of the assets present in the commodity and specialty value chains, since they strongly condition the structuring of the governance mechanisms present in these interaction spaces. The presence of certain categories of asset specificity increases or decreases the bargaining power of producers or intermediaries. The conditions of bargaining power consequently imply the establishment of relational contracts supported by different governance mechanisms, which interfere in the conditions of value appropriation to the benefit of extractivists present in the cocoa bioeconomy in Amazonas.

Based on these findings, the article addresses a set of practical implications not only for producers, but also for other organizations engaged in the development of an inclusive bioeconomy in the Amazon. To increase the conditions for value appropriation for the benefit of forest populations, the planning and evaluation of public bioeconomy policies (which have recently multiplied in Brazil) should be guided by the promotion of more equitable relationships between producers and other actors. These policies should promote value chains based on specific assets that lead to an increase in income appropriation. Additionally, organizations that create public policies and producer organizations should consider the existence of the conditions presented in this study as selection criteria and priorities for structuring and evaluating the impact of bioeconomy value chains. Incidentally, an important metric for evaluating these chains is precisely their capacity to establish more equitable relationships for value appropriation.

Despite its contributions to the debate on the Amazon bioeconomy, it is important to note that the study focused its efforts on identifying different governance mechanisms established in the segments of the cocoa value chain in Amazonas, investigating the singularities of just one

of the many chains responsible for the subsistence of forest populations. In this sense, it is equally important that new studies consider integrative approaches (intersectional and horizontal) between the different governance mechanisms practiced in bioeconomy value chains, bringing to light more robust knowledge about the different livelihoods adopted (often in a combined manner) by extractive communities in different territories of the Amazon. A fertile field of investigation, for example, lies in the comparison with other value chains, whether of cocoa itself in other states of the Amazon or linked to other fruits and inputs characteristic of the region

Although the different landscapes of the Amazon require unique production systems and business models, we must not lose sight of their compatibility with the central principle of distributive equity. This principle aims to avoid distorting the 'bioeconomy in the Amazon' with proposals that reproduce asymmetrical relations of power and value appropriation, such as those practiced in the commodity cocoa chain, as opposed to those supposedly practiced in the specialty cocoa chain, which tends to establish a higher level of symmetry. Although this higher level of equity (of income distribution among the links in the specialty cocoa chain) remains a point of investigation for future studies,

the relationship between the reduction of power asymmetries and the increase in the capacity for value appropriation by the true protagonists of the Amazon bioeconomy remains latent: the local populations that give life to the territories, guarantee the conservation of the forest, and energize the local economy.

NOTES

1. Williamson (1985) identifies six types of asset specificity: locational, physical, temporal, human, brand, and dedicated.
2. The concept of Pareto optimal refers to a situation in which resources are allocated in a way in which it is impossible to improve the situation of an individual without worsening that of another, without worrying directly about income distribution, but with the maximization of efficiency in the use of resources. (Mas-Colell et al., 1995).
3. This proposition is aligned with Bragelien e Impink (2014), study, which argues in its analysis that despite the isolated effect of specificity of relations being ambiguous, there are significant positive effects on the interaction with bargaining power.

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Funding

São Paulo State Research Foundation (Fundação de Amparo à Pesquisa do Estado de São Paulo) (FAPESP 2020/0886-1 e 2022/14597-8; Amazonas State Research Foundation (Fundação de Amparo à Pesquisa do Estado do Amazonas) (FAPEAM 2020/08886-1); and National Council for Scientific and Technological Development (Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq 409595/2022-5).

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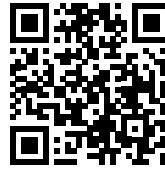
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Data Availability

The authors claim that all data used in the research have been made publicly available, and can be accessed via the Harvard Dataverse platform:



Trindade, Lucas Xavier; Saes, Maria Sylvia Macchione; Fernandes, José Augusto Lacerda; Marcovitch, Jacques, 2024, "Replication Data for: "Governance and value appropriation in the cocoa bioeconomy at Amazonas" published by RAC-Revista de Administração Contemporânea, Harvard Dataverse, V1.

<https://doi.org/10.7910/DVN/2P9DQX>

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