

AMAZON SOCIO-BIODIVERSITY IN SEARCH OF INTERNATIONAL MARKETS

*A SOCIOBIODIVERSIDADE AMAZÔNICA EM BUSCA DE MERCADOS
INTERNACIONAIS*

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INTERNACIONALES*



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ABSTRACT: In the Brazilian Amazon, the concept of bioeconomy sheds new light on the sustainable processing and commercialization of forest products associated with the territories of indigenous peoples and local communities. This article analyzes the potential to develop cosmetic products from natural ingredients based on local knowledge, and according to international market demand. First, we review the concept of bioeconomy and its linkages to the promotion of socio-biodiversity. We then present the main trends observed in the international cosmetics market. Drawing from field experiences with Amazonian populations, visits to fairs, and interviews with cosmetics professionals, we then identify the obstacles to a wider commercialization of Amazonian products. We conclude with a discussion of how compatible the notion of socio-biodiversity is with the market logics.

KEYWORDS: Amazon. Bioeconomy. Cosmetic products. Value chains. Indigenous and local communities.

RESUMO: Na Amazônia brasileira, o conceito de bioeconomia lança uma nova luz sobre sustentabilidade do processamento e comercialização de produtos da floresta associados aos territórios de povos e comunidades tradicionais. Este artigo se propõe a discutir as potencialidades do desenvolvimento de ingredientes naturais (bioinsumos) a partir do conhecimento de populações locais, de acordo com a demanda dos mercados internacionais. Primeiramente, vamos relembrar como surgiu o conceito de bioeconomia, vinculado à promoção da sociobiodiversidade. Em seguida, apresentaremos as principais tendências observadas no mercado internacional de cosméticos. Com base em nossas experiências de campo com as populações amazônicas e visitas realizadas em feiras e com profissionais da área cosmética, identificaremos os obstáculos a serem superados para uma comercialização mais ampla dos produtos amazônicos. Ao final avaliaremos o quanto a noção de sociobiodiversidade é compatível com a lógica de mercado.

PALAVRAS-CHAVE: Amazônia. Bioeconomia. Produtos cosméticos. Cadeias de valor. Povos e comunidades tradicionais.

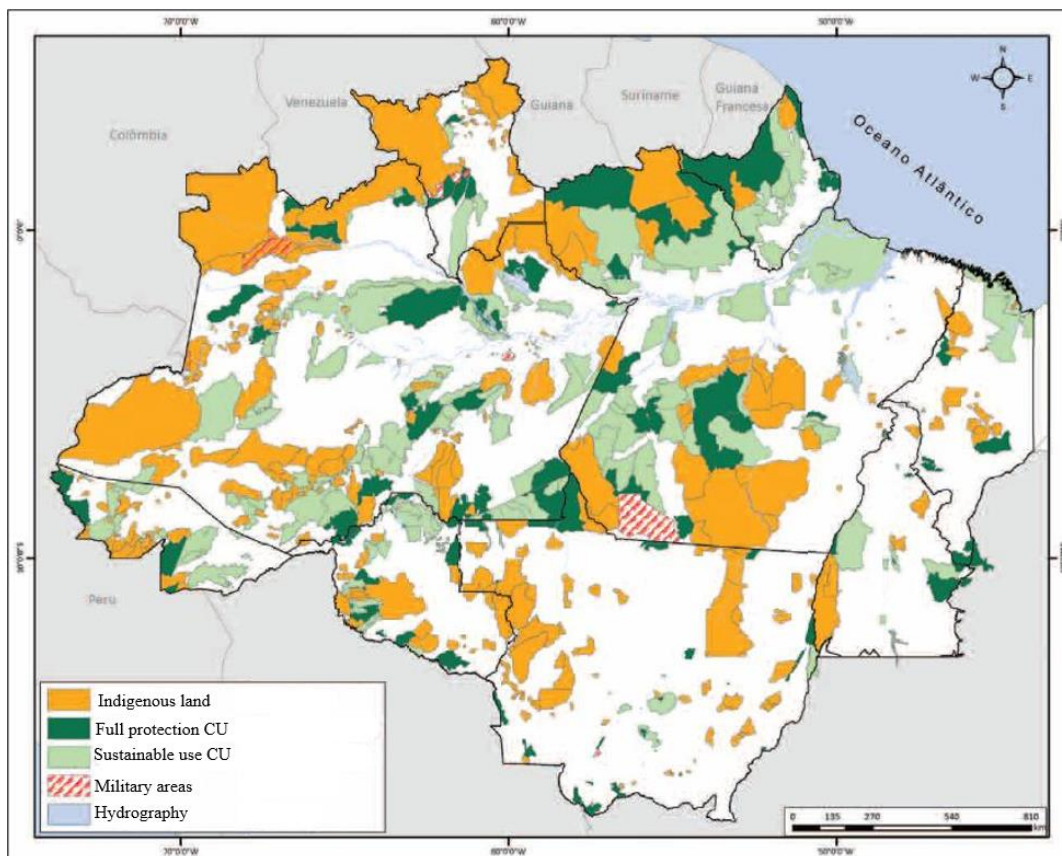
RESUMEN: En la Amazonía brasileña, el concepto de bioeconomía arroja nuevas luces sobre la sostenibilidad del procesamiento y comercialización de productos forestales asociados a los territorios de pueblos y comunidades tradicionales. Este artículo propone discutir el potencial para el desarrollo de ingredientes naturales (bioinsumos) a partir del conocimiento de las poblaciones locales, de acuerdo con la demanda de los mercados internacionales. Primero, presentamos cómo surge el concepto de bioeconomía, vinculado a la promoción de la sociobiodiversidad. A continuación, haremos referencia a las principales tendencias observadas en el mercado cosmético internacional. Con base en nuestras experiencias en campo con poblaciones amazónicas y visitas realizadas en ferias y con profesionales en el campo de la cosmética, identificaremos los obstáculos a superar para una comercialización más amplia de los productos amazónicos. Al final, evaluaremos qué tan compatible es la noción de socio-biodiversidad con la lógica del mercado.

PALABRAS CLAVE: Amazonia. Bioeconomía. Productos cosméticos. Cadenas de valor. Pueblos y comunidades tradicionales.

Introduction

In her first speech as Environment Minister in the new Lula government, on 4 January 2023, Marina Silva announced the creation of a Bioeconomy Secretariat to stimulate an economy that values socio-biodiversity. The idea is to recognize the knowledge associated with biodiversity so that its holders, traditional peoples and communities, can obtain a decent income from it and the means to manage their territories (Figure 1).

Figure 1 - Map of the Amazon with land use categories according to type of use. Areas in yellow and light green are socio-biodiversity territories, respectively indigenous lands and sustainable use CUs (conservation units)



Source: ISA and Imazon, 2011 apud Imazon, 2015

Could the bioeconomy be a new avenue for promoting socio-biodiversity products? The objectives of the Convention on Biological Diversity (CBD) with the concept of sustainable development advocate the economic valuation of elements of biodiversity as a transformative lever guaranteeing their conservation and the income of traditional populations (BRUNDTLAND, 1987; CBD, 1992). But is the bioeconomy capable of overcoming the

structural problems inherent in the Amazon, both in terms of the inclusion of traditional populations and the infrastructure bottlenecks for the development of its value chains?

Brazil became a global leader in the environmental debate with the promulgation of the Citizen's Constitution (BRASIL, 2016) and by hosting the Second UN Conference on Environment and Development (RIO-92), when the Framework Convention on Climate Change (FCTC) and the Convention on Biological Diversity (CBD) were signed. In the context of the negotiations, the position defended by Brazil was one of multilateral cooperation with "common but differentiated responsibilities and respective capabilities" (CBDR, a principle declared by the FCTC in 1992), bringing to the center of the debate the confrontation of regional inequalities between countries in the global North and South and the need for the transfer of resources and technologies as conditions for confronting global challenges.

This sovereign position reflects the progress made in Brazil with the mobilization of civil society around the National Council of Rubber Tappers (CNS – Portuguese initials) and the Alliance of Forest Peoples in defence of the territorial rights and ways of life of the traditional peoples and communities of the Amazon (MEMORIAL CHICO MENDES, 2022). A violent struggle, which ended in the murder of several leaders, including Chico Mendes in 1988, was a milestone for the construction of a policy of regularization and demarcation of territories for collective use. In turn, Brazil is acting on the international stage in favor of promoting the sustainable use of biodiversity and elevating traditional peoples and communities as guardians and providers of traditional knowledge associated with biodiversity, ensuring that they share the benefits of access to and use of these resources (ALEGRETTE, 2011).

However, these populations still live in precarious conditions and the social indicators of the Brazilian Amazon are currently the worst in Brazil⁴. The myth surrounding the "green treasure" created by the CBD is far from being a consolidated practice⁵. Traditional knowledge and practices about biodiversity, their efforts to protect the environment, as well as the products

⁴ Some indicators compared to the national average: infant mortality rate is approximately 50% higher; life expectancy is about 5% lower; social vulnerability index (IVS-IPEA) is close to 40% higher; population aged 25-29 who neither work nor study is 10% higher; monthly household income per capita is 40% lower; rate of masters and doctors per 100,000 inhabitants is approximately 15% compared to 45% in the rest of the country (IBGE, 2010).

⁵ If on the one hand Brazil was a pioneer with Provisional Measure 2186-16/2001, then with Law 13.123/2015 (BRASIL, 2015) on access to biodiversity and benefit sharing, it recognized the rights and duties of the state in relation to its Traditional Peoples and Communities (Decree Law 6.040/2007 and Decree 5.051/2004 - ratifies ILO Convention 169) and their territories (Law 11.284/2006 on Public Forest Concessions). On the other hand, in recent years there has been a significant increase in the loss of forests (INPE, 2022), an escalation in violence against the populations and invasions, illegal exploitation of resources and damage to property in their territories (CIMI, 2022; CPT, 2022).

they extract and transform from it, are still not recognized by the market in the form of inputs with high commercial value and a fair economic return for the communities.

However, the valorization of sociobiodiversity products is part of a context in which the logic of the regulatory market applied to social and environmental issues prevails (AUBERTIN, 2002), where there is doubt as to whether the commercialization of sociobiodiversity products alone can guarantee the conservation of forests and improve the quality of life of their populations (HOMMA, 2018).

To answer this question, this article sets out to discuss the potential role to be played by international markets, particularly the cosmetics sector, as a driver of the socio-biodiversity bioeconomy through the use of natural ingredients (bio-inputs) from Amazonian biodiversity associated with the knowledge of local populations and considering the increasingly demanding profile of consumers.

First, we will look at how the concept of the bioeconomy came about and how this debate fits into the context of the Amazon and the promotion of socio-biodiversity. Next, we present the main trends observed in the international cosmetics market. Based on a review of the literature, our field experiences with Amazonian populations, visits to fairs and interviews with cosmetics professionals, we analyze the obstacles to be overcome and possible strategies for a broader commercialization of Amazonian products. Finally, we discuss the extent to which the notion of socio-biodiversity is compatible with market logic.

Bioeconomy of socio-biodiversity: an ongoing debate

Keeping tropical forests standing and halting deforestation are fundamental attributes for decarbonizing the world economy, as well as promoting the conservation of biodiversity and its valuation and sustainable use (ABRAMOVAY; EULER; COSTA, 2022). In this context, tropical forests should be at the center of the agenda to promote the bioeconomy worldwide, but at the international level, there are few scientific references associating the bioeconomy with tropical forests (BUGGE; HANSEN; KLITKOU, 2016; ABRAMOVAY; EULER; COSTA, 2022). National strategies and policies are mostly focused on carbon metrics, and the economic dimension is clearly dominant, while environmental and social perspectives are less represented (COSTA, 2021).

Historically, the European Union (EU) has been a protagonist in this area, adopting a program of investment in technologies based on inputs of biological origin in order to reduce

its energy dependence on fossil fuels. This involves dedicating agricultural land to the production of biomass (energy crops) or energy (agrivoltaism), having new materials of biological origin replace plastics, developing green chemistry through bioengineering etc. (EUROPEAN UNION, 2012). In the last twenty years, the bioeconomy, which is also associated with the concepts of green economy and circular economy, has emerged as an alternative production model associated (mainly) with the replacement of fossil-based fuels and materials with biological ones, increased efficiency and productivity in the use of natural resources and, ultimately, social inclusion (UNEP, 2022).

In Brazil, there are government programs to promote the bioeconomy at both the federal and state levels, with a variety of approaches: biotechnology, bio-inputs, socio-biodiversity chains, restoration, environmental services etc. Notably, the impact of these programs is still low, considering the budget constraints, the lack of a strategic vision and governance instruments around their implementation (COSTA, 2021)⁶. The states of Amazonas and Pará, the largest states in the Brazilian Amazon in terms of surface area, have also defined their guidelines and strategic production chains for a bioeconomy program (AMAZONAS, 2021; PARÁ, 2021).

This dispute over narratives and the breadth of concepts carries ambiguities that have been the target of criticism. During the World Bioeconomy Forum held in Belém in 2021, social movements drew up a document criticizing the lack of representation and space for discussion.

We do not agree with any attempt or strategy based solely on market logic. We are opposed to innovation processes that result in technological packages and high-input production systems that replace native forests with monocultures of genetically uniform varieties (CARTA DA AMAZÔNIA 2021, n.p., our translation).

In this regard, the Food and Agriculture Organization of the United Nations (FAO) has promoted principles aimed at the sustainability of bioeconomy programs, which include governance mechanisms to ensure processes of consultation and risk management (FAO, 2021).

Costa (2021, p. 16, our translation), in discussing the theoretical models of bioeconomy and their application to the Amazon context, concludes that "this new bioeconomy for the largest tropical forest on the planet must be creatively implemented, as there are no other tropical countries that have developed it". When comparing the main approaches classified by

⁶ Some examples are the Action Plan for Science, Technology and Innovation in the Bioeconomy and the Biofuture Platform (MCTI, 2018), the Bioeconomy Brazil - Socio-biodiversity program (BRASIL, 2019), the Bioeconomy Priority Program (PPBio) (SUFRAMA, 2018).

Bugge, Hansen and Klitkou (2016) - biotechnological, bioresources and bioecological - the author argues that the most appropriate for the Amazon is primarily aligned with the concept of bioecological bioeconomy, based on the promotion of biodiversity, conservation and restoration of ecosystems and their services, also integrating social participation and distribution of benefits among the different actors that make up the value chains. Costa and other authors (2022) call this new paradigm the "socio-biodiversity bioeconomy", based on agroforestry systems, extractivism and local solutions capable of promoting endogenous development.

Similarly, Waack *et al.* (2021), in presenting a proposal formulated by the *Concertação para Amazônia*⁷, classify three typologies or bioeconomies: forestry, commodities and socio-bioeconomy. The latter includes productive knowledge networks associated with forests and their traditional peoples and communities, with science and technology applied to promoting sustainable use and reducing social and territorial inequalities.

Other prominent visions refer more specifically to the issue of valuing socio-biodiversity in international markets. The Amazonia 4.0 initiative⁸, driven by researcher Ismael Nobre (NOBRE; NOBRE, 2019), proposes integrating forest peoples and communities into the fourth industrial and technological revolution (artificial intelligence, internet of things, big data, neural networks, drones, remote sensors, QR Codes and other devices) to promote bio-industries that generate innovative products with high added value in the region. The National Bank for Economic and Social Development (BNDES), for its part, envisions a bioeconomy in the Amazon geared towards productive activities and technological development, adding value to Amazonian socio-biodiversity through investments in the areas of traditional knowledge and technological innovation to add value to biomass, preservation and expansion of forests (PAMPLONA; SALARINI; KADRI, 2021).

All the visions of a bioeconomy for the Amazon converge on principles such as promoting diversity, equity, inclusion, regeneration, governance and valuing and respecting traditional knowledge. They also highlight the need to incorporate scientific and technological innovations and infrastructure as a condition for transforming natural resources into goods and services of high economic and social value.

⁷ A Concertação pela Amazônia is a "network of people, institutions and companies formed to seek solutions for the conservation and sustainable development of this territory". Available: <https://concertacaoamazonia.com.br/sobre-nos/>. Access: 14 Sept. 2023.

⁸ Amazonia 4.0 is an institution made up of scientists and researchers working in partnership with organizations whose main task is to deliver environmental solutions for collective well-being. Available: <https://amazonia4.org/institucional/>. Access: 14 Sept. 2023.

This article adopts the vision of the socio-biodiversity bioeconomy as proposed by Costa *et al.* (2022), and sets out to explore the specific area of cosmetics markets. We start from this particular example to understand the current or potential role of consumers and international markets and to discuss whether the ideology of socio-biodiversity is compatible with the logic of markets. In the next section we will analyze the main trends and the participation of Amazonian products in the world cosmetics market.

Trends in the international cosmetics market towards socio-biodiversity: "back to nature"

Brazil, and in particular the Amazon region, holds 30% of the planet's biodiversity. There are around 30,000 catalogued plant species (REFLORA, 2021), more than 159 with current and potential economic use (CORADIN; CAMILLO; VIEIRA, 2022), 60 of which are for cosmetic production (PASTORE *et al.*, 2005). Ensuring the future of the forest requires a new economic model capable of promoting sustainable use, reducing deforestation rates and ensuring rights and income distribution for its traditional peoples and communities. It is worth remembering that 90% of deforestation in the Amazon is illegal and occurs on public land (MAPBIOMAS, 2022). In practice, the region's economic dynamics are still associated with activities that are not compatible with the forest, such as extensive cattle ranching and grain monoculture.

There are currently numerous barriers to realizing the potential of the socio-biodiversity bioeconomy, starting with the low density of exploratory research into species, their distribution and the characteristics that differentiate them in terms of their potential uses (RIBEIRO; SOARES-FILHO, 2022). Even the product chains that are already known and have consolidated markets are not very competitive due to the low level of structuring and productive organization (handling and processing protocols, logistics, regulatory and health aspects etc.) (VEIGA; RIOS, 2021).

The exploratory choice of this study, focusing on the cosmetics sector, is due to its great potential for adding value to socio-biodiversity products (CNI, 2013), sharing benefits and promoting local development. Currently, the share of Amazonian products, such as vegetable oils and butters, in international markets is irrelevant (COSLOVSKY, 2021). On the other hand, natural substances represent a strategic asset for cosmetics companies as they have great market appeal (FEBEA, 2022), although they are present in small quantities in most (75%) of the so-called "natural products" (WYNBERG; LAIRD, 2015).

According to a report published by *Zion Market Research* (2018), the global beauty and cosmetics market is expected to exceed 863 billion dollars by 2024. This global market is showing a remarkable annual growth rate (an average of 5% between 2017-2020), driven above all by digital influencers, scientific advances translated into new technologies and product innovations. It is a dynamic sector to which consumers devote a large part of their budget, and they are increasingly concerned about ethical issues, natural, organic and sustainable products (FEBEA, 2022; COSMETICA ITALIA, 2022). Rising incomes in the Asian and Brazilian markets and the growing inclusion of women in the job market are also factors that have had a direct impact on the growth of the cosmetics market (L'ORÉAL, 2020).

According to statistical studies and reports published by companies in this segment, Asians are the biggest consumers of cosmetic products, followed by North Americans and Western Europeans (STATISTA, 2022; L'ORÉAL, 2020; WYNBERG; LAIRD, 2015; ALIOZE, 2022). Brazil is the fourth largest market in the world, behind only the USA, China and Japan (WEBER, 2020). France is the main exporting country and dominates the global cosmetics market. There is a great deal of investment in research - into ingredients, raw materials, formulations, packaging - in the region known as the "Cosmetic Valley", which is recognized as a center of excellence in this area (COSMETIC VALLEY, 2023). This economic activity involves 3,200 companies and generates 246,000 jobs, 80% of which are family-run and 57% of whose employees are women. It involves nine universities, 220 public laboratories and 8,200 researchers (FEBEA, 2021).

According to the *Fédération des Entreprises de la Beauté* (FEBEA), investment in Research and Development (R&D) is the most efficient in France, with 3.6 patents filed per million euros spent. Worldwide, investment in R&D is estimated at 9 billion US dollars (WYNBERG; LAIRD, 2013). Natural ingredients and extracts accounted for 49% of all patent activity in the "personal care" industry between 1990 and 2009, 34% attributed to plants (WYNBERG; LAIRD, 2013). Most patents are based on formulas based on well-known and long-marketed species (e.g., Aloe vera, sandalwood, patchouli, rose, mint, jasmine). The species of Amazonian biodiversity have been little studied and are therefore unknown on the (national and international) markets. There is therefore a huge field of prospecting to be explored.

The marketing area has a major influence on companies' decisions about trends, the search for novelty and originality, as products have shorter and shorter life cycles. New products are being "enriched" with natural ingredients in response to growing consumer

concerns and expectations. Thus, according to the Slow Cosmétique Association (2020), although conventional cosmetics continue to account for the lion's share of sales (around 90%), the demand for ecological, healthy and natural products, as well as the different certifications (organic, vegan, COSMOS, USBT, fair trade, etc.) has seen an average growth of 44%. The main factor limiting the purchase of natural products is price, as 51% of French consumers consider cosmetics based on natural ingredients to be too expensive.

A handful of companies account for around 50% of total sales of natural cosmetics, with revenues of around US\$10 billion in 2013 (WYNBERG; LAIRD, 2015). A Brazilian company is among the largest in this market, with a presence in more than 100 countries. In its 2021 Annual Report, Natura presents 38 bio-ingredients supplied by 64 communities and around 10,000 families in the Amazon, and in 17 other countries (NATURA & CO, 2022). Also Brazilian is the main supplier of natural (bio-raw materials) and organic ingredients from the Amazon, controlled by a Swiss multinational in the chemical industry. It exports ingredients to companies in 70 countries and claims to contribute to the conservation of 2 million hectares of native vegetation through sustainable production activities, 98% of which are located in the Amazon (GRUPO SABARÁ, 2021).

An important point regarding the size of the demand for natural ingredients (e.g. oils, butters and plant extracts) is that, in general, the quantities of ingredients used in cosmetic products are very small. Due to the lack of regulation regarding nomenclature, products with different percentages of ingredients (from 90% to less than 10%) can be called natural, bio-based, green cosmetics, bioactive, making them appear equivalent to consumers (RENEWABLE CARBON, 2019).

Figure 2 - Natura Case: Natura Amazonia Program (PAM)

The Natura Amazônia Program (PAM) aims to foster sustainable business and local development, always with a focus on valuing the region's socio-biodiversity, traditional knowledge and culture. PAM's investments are based on three pillars: i) Science, Technology and Innovation; ii) Institutional Strengthening of communities supplying raw materials; iii) Structuring sustainable socio-biodiversity production chains. In the last 20 years, its investments in the Amazon have amounted to around R\$2 billion, helping to preserve more than two million hectares of forest, and having allocated R\$33 million in benefit sharing to 40 communities for access to genetic heritage and traditional knowledge.

Source: Relatório Natura & CO, 2021

The "story" of different ingredients associated with their region of origin is a critical part of brands and has great marketing appeal (WYNBERG; LAIRD, 2015). In this sense, local

communities are limited to the role of suppliers of raw materials (e.g. seeds, bark, resin) with little or no added value and low economic return (RIBEIRO; SOARES-FILHO, 2022). For companies, working with natural products, especially from the Amazon, is challenging, as it requires a large investment in logistics, R&D and product marketing to promote their acceptance by consumers (NATURA & CO, 2022).

Finally, those who consume these products are benefiting from an ecosystem service (provision) offered by the forests, and an environmental service resulting from the work of communities (extractivists, indigenous people, quilombolas, babassu coconut breakers) who ensure its protection. Incorporating these services into the sale value of sociobiodiversity products would be an immediate response to combat the current problems faced by communities (low prices, hunger, inequality etc.) while gaining autonomy. In contrast, the race for carbon markets has many intermediaries (NGOs, certifiers, traders etc.) and ethical issues (selling credit to continue emitting CO₂), as well as being a speculative market (THE GUARDIAN, 2023).

The enormous potential of Amazonian biodiversity has generated little return for the traditional communities that hold ancestral knowledge about its use (TOZATO *et al.*, 2021; RIBEIRO; SOARES FILHO, 2022). Despite Brazil being a forerunner in the implementation of the CBD, with a national regulatory framework in place for more than 20 years (Provisional Measure - MP 2186-16/2001; Law 13123/2015; Decree 8772/2016), the sharing of benefits from access to genetic resources and associated traditional knowledge (ABS) by user companies has generated much less revenue than expected: around R\$24 million in the period 2001-2020, 83% of which has not yet been paid (TOZATO *et al.*, 2021). If, on the one hand, the issue is considered complex and arouses uncertainty and caution in companies that adopt a "wait and see" attitude in order to minimize image risks and intricate compliance protocols with the laws of different countries (WYNBERG; LAIRD, 2015). On the other hand, it is essential to increase transparency about the use of native species in the processing industries and map the production chains of biodiversity products (RIBEIRO; SOARES FILHO, 2022).

In practice, the trend is for new lines of natural products to use agricultural species, especially fruit and vegetables (e.g., grape seeds, apples, pears, berries) that are known worldwide and do not fall under the benefit-sharing requirements of the Nagoya Protocol. Ingredients derived from food waste have been exploited to obtain "healthier" cosmetics: cosmeceuticals, nutraceuticals and nutricosmetics (FARIA-SILVA, *et al.*, 2020). Beauty, well-

being and health are related concepts, so many advances in the field of product biotechnology are shared between the cosmetics, food and pharmaceutical industries (DINI; LANERI, 2021).

Another trend for major brands, especially in Western Europe, is to prioritize the prospecting of local biodiversity assets, with short circuits for the supply of raw materials. Many companies are investing in their own cultivation areas and also buying from harvesters (FEBEA, 2022).

Natural products based on species considered "exotic" (e.g., sandalwood, myrrh, cassia, cedar, camphor, roses, peppers) have a long history of trade and great consumer acceptance, especially for luxury brands. In this case, countries belonging to the ancient eastern routes that include Asia, the Middle East and North Africa, continue to be the main suppliers of imported natural raw materials for the beauty sector. Another trade route for raw materials in the European cosmetics sector are African countries with which they have had colonial relations. These are essentially products with a fair trade appeal, which reinforce the marketing strategy of ethical, natural/organic products and support for development and the fight against poverty. Some examples of products are Shea butter, Baobab oil, Argan oil and Vanilla essence (FEBEA, 2021).

Figure 3 - L'ORÉAL case

Since 2014, 100% of the shea volumes purchased by L'Oréal come from Burkina Faso. 40,000 women organized into seven producer groups supply the company with raw materials. The benefits associated with this value chain include a fair price, pre-financing of harvests, the payment of a premium associated with improved product quality, ongoing training and the implementation of a community fund to implement local development projects.

Source: *Fédération des Entreprises de la Beauté* (FEBEA), 2022

Recent studies on the potential and obstacles to accessing the international market for Amazonian biodiversity products (COLOVSKY, 2021; APEX, 2022; CONEXSUS, 2022; ORIGENS, 2021) converge on the challenge of balancing the specificities of market/industry demand (volume, quality, standardization), the peculiarities associated with the species of interest (ecology, distribution, density, carrying capacity, level of threat) and their traditional forms of extraction. In this case, it is important to consider that these are based on traditional knowledge and adapted to a logic of subsistence production with the sale of surpluses (ALEGRETTI, 2011).

Responding to the new logic of large-scale production requires the existence of good practice protocols based on technical and scientific knowledge that assess and monitor the carrying capacity of ecosystems. And studies in this area are still quite scarce for Amazonian socio-biodiversity species. It also requires the strengthening of social organization to overcome historical challenges related to informality and imperfect markets (CIALDELLA *et al.*, 2021; ABRAMOVAY *et al.*, 2021), as well as the construction of Community Protocols that define collective agreements for the management of natural resources and territories, and indicate how communities want to be consulted by the government and companies on benefit sharing and conflict resolution mechanisms (EULER, 2021).

Table 1 shows a list of the main bio-ingredients from Amazonian sociobiodiversity present at *In-Cosmetics Global* (Figure 4), the world's largest cosmetics industry trade show. Most of the products are from Brazilian companies that occupied the Brazil Pavilion promoted by the Brazilian Trade and Investment Promotion Agency (Apex Brasil).

Table 1 - List of the main bio-ingredients from Amazonian socio-biodiversity present at the In-Cosmetics Fair in 2022

| PRODUCT | SPECIES | Oils | TYPE OF INGREDIENT | | |
|---------------|-------------------------------|------------------------------|--------------------|----------|--------|
| | | | Butters | Extracts | Resins |
| Açaí | <i>Euterpe oleracea</i> | X | | X | |
| Andiroba | <i>Carapa guianensis</i> | X | | X | |
| Babassu | <i>Orbignya oleifera</i> | X | | | |
| Buriti | <i>Mauritia flexuosa</i> | X | | X | |
| Guaraná | <i>Paullinia cupana</i> | X | | X | |
| Amazon nut | | <i>Bertholletia excelsa</i> | X | | |
| Copaíba | | <i>Copaifera officinalis</i> | X | | |
| Passion fruit | | <i>Passiflora edulis</i> | X | | |
| Pataúá | <i>Oenocarpus bataua</i> | X | | | |
| Pracaxi | <i>Pentaclethra macroloba</i> | X | | | |
| Urucum | <i>Bixa orellana</i> | X | | | |
| Rosewood | <i>Aniba rósea</i> | X | | | |
| Bacuri | <i>Platonia insignis</i> | X | X | | |
| Cupuaçu, | <i>Theobroma grandiflorum</i> | X | X | | |
| Murumuru | <i>Astrocaryum murumuru</i> | X | X | | |
| Tucumã | <i>Astrocaryum vulgare</i> | X | X | | |
| Ucuúba | <i>Virola surinamensis</i> | X | | | |
| Breu branco | <i>Protium heptaphyllum</i> | | X | | |

Source: Devised by the authors (2022)

Figure 4 - Products from Amazonian socio-biodiversity presented at In-Cosmetic, the world's largest trade fair for cosmetics industry inputs



Source: Photo by Ana Euler, 2022

It is essential to ensure responsible and ethical mechanisms for the fair sharing of benefits between providers and users of biodiversity, to avoid an imbalance of power between "the industry" and "the community", enabling a balance between respect for local culture and ways of life and the demands of business (RIBEIRO; SOARES FILHO, 2022; COSTA, 2021). Currently, most of the successful experiences rely on the intermediation and technical support of non-governmental organizations and non-reimbursable financing. These are pioneering initiatives, and for this reason they have not yet reached the maturity that would prove their viability without such support.

Açaí, guaraná, pineapple, nuts and cocoa were identified by Apex (2022) as the main Amazonian products with potential for market expansion and recognized by foreign consumers as "Brazilian" products. Currently, the destination of exports is largely restricted to South American countries with geographical proximity, not coinciding with the world's largest importers. Like Colovsky (2021), this study concludes that the best strategy for increasing the participation of Amazonian products in international markets is to prioritize investments in production chains that are already structured and have established markets, with a focus on improving the quality of exported products and promoting pre-competitive arrangements.

Costa and other authors (2022) disagree with the strategy of prioritizing international markets, which are more demanding in terms of legislation and (voluntary) certification standards, and which in the end do not guarantee better pay for producers. For these authors, the best way to leverage the socio-bioeconomy in the Amazon is to invest in expanding local, regional and national markets, since Brazil has a huge consumer market (4th largest cosmetics market and 2nd largest fragrance market) that is still unfamiliar with Amazonian products. Investing in new business models that seek to value the origin, emphasizing the holistic qualities over the quantities of socio-biodiversity products (RIBEIRO; SOARES FILHO, 2022; SMERALDI; SANTOS, 2021).

This strategy has been adopted by various NGOs to connect communities, companies and consumers throughout the country. The experience of the *Origens Brasil program* (2021) emphasizes that the generation of value is essentially related to the origin of the product and who produces it. Transparency, dialog, control mechanisms, traceability and respect for the forest peoples' way of life are values that guide the relations of this network, which connects 2,210 producers and 35 companies with a socio-environmental commitment. This could be a strategy to be adopted by the Brazilian Association of the Personal Hygiene, Perfumery and Cosmetics Industry (ABIHPEC), which has 2794 companies registered with Anvisa (WEBER, 2020).

The natural ingredients supply chain

Many bio-inputs and plant species are shared by the cosmetics and food industries, which is why the supply chain uses common intermediaries (WYNBERG; LAIRD, 2015). The suppliers of raw materials, extractivists or family farmers, produce in small quantities and have no information about the market. Those who buy are usually middlemen, people who have penetrated the communities and have (sometimes abusive) pricing power to guarantee cheap raw materials and the "viability" of the products on the market. They sell to distributors, who in turn supply formulators of intermediate products (bio-inputs), an important stage in adding value to the chain. These bio-inputs can pass through distributors again and then finally reach the big brands that launch finished products. Distributors and formulators are key players in this chain, as they are the ones who effectively prospect for new products to be offered to the big brands internationally. It is a long chain, with a great deal of disconnection between its agents.

Socio-biodiversity products have high production costs due to their extractive nature, remote location and lack of infrastructure. The cosmetics market is very demanding, especially in terms of product quality standards. The stability of the raw material and its performance are key factors when choosing products (e.g., functional properties). This is the real value of a new product, in addition to the socio-environmental issues that are closely associated with the marketing area. There are numerous regulatory laws for each country. Technical, health and environmental standards tend to become the main barrier to market access for extractive and agroforestry products from the Amazon (VEIGA; RIOS, 2021). In order to be suitable for export, products need to have technical data sheets with physical-chemical and toxicity analyses, among others. These procedures are expensive and require specialized laboratories. These procedures are beyond the reach of producers and small businesses in the Amazon.

In addition, international companies are looking for products with voluntary certifications to satisfy customers who are increasingly demanding in terms of product sustainability standards (CONEXSUS, 2022). The main voluntary certifications used by the cosmetics sector to give credibility to the sustainability of their products are Iso 26000, ISO16128, UEBT, LVMH, EcoVadis, Fair for Life, Ecocert, NATRUE, COSMOS, BDIH and Fairtrade. On the one hand, certification standards require changes to traditional forms of production and result in increased work and costs for producers. On the other hand, buyers (intermediaries) are rarely willing to pay more for certified products.

Final considerations

We know that the commercialization of socio-biodiversity products alone cannot guarantee the protection of the forest and the well-being of its populations. Bioeconomy policies aimed at the Amazon need to respond to environmental challenges and reduce social inequalities, and be accompanied by infrastructure development policies and the empowerment of local organizations, among others.

We tried to assess the extent to which the cosmetics sector represents (or not) an opportunity for Amazonian socio-biodiversity products and for the promotion of a bioeconomy that integrates immaterial and ethical values with biological assets, valuing the traditional knowledge of forest peoples and communities. Whether the global concern for the conservation of the world's largest rainforest will be able to "humanize" the market, or at least make

companies and consumers aware of the need to invest in value chains that generate opportunity, greater autonomy and development in the Amazon region.

Although the theme of "sustainability" is a central issue in the hegemonic discourse of the cosmetics sector, and demand for natural products is booming, brands and industries make decisions about which products and regions to invest in based primarily on existing knowledge about the species, their availability, quality and characteristics of the raw materials. The story that accompanies the product is a valued attribute for promoting the image of companies, but it is not the main factor.

Therefore, given the context presented, realizing the potential of Amazonian socio-biodiversity on the international stage is a challenging task. It essentially requires the structuring of supply chains for products that already have a market, and a marketing strategy to boost the image of the Amazon and relate it to the growing demand for natural, ethical and sustainable products. Above all, however, it is essential to prioritize research into the active principles that characterize the functionality and distinctiveness of the species, which are still little known. This can and should be done by associating traditional knowledge with the latest scientific advances, generating added value and sharing benefits that guarantee regional development.

The example of France is interesting: by integrating companies, universities and start-ups into a "Cosmetic Valley", it has been able to remain at the forefront of the sector, generating knowledge and innovations with the emergence of new companies every year. The Amazon has the potential to become a 'Cosmetic Valley of Sociobiodiversity', but Brazil needs to innovate by creating an environment to promote pre-competitive arrangements, the co-construction of knowledge and lasting partnerships between traditional peoples and communities, research and innovation centers and companies committed to socio-environmental values. It needs to improve the level of information on the conditions for promoting partnerships and international trade, in particular on the application of Law 13.123 on Biodiversity (BRASIL, 2015) and the Nagoya Protocol, which is fundamental for guaranteeing the safety of researchers, investors and, above all, populations.

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