BIOECONOMY FINANCING ECOSYSTEM IN THE LEGAL AMAZON

DIAGNOSIS, EXPERIENCES, AND RECOMMENDATIONS FOR INTEGRATED ACTIONS

UMA CONCERTAÇÃO PELA AMAZÔNIA

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Bioeconomy Financing Ecosystem in the Legal Amazon: diagnosis, experiences, and recommendations for integrated actions

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About Uma Concertação pela Amazônia

A network of over 900 people and institutions dedicated to qualifying the debate around solutions for the conservation and sustainable development of the Amazon(s), with impact on the country's socioeconomic agenda and planetary well-being. More than a space for dialogue and systematization of knowledge that values diversity and traditional and scientific knowledge, the network develops studies, implements structuring initiatives, articulates, and forwards territorial demands for the collective construction of public policies in partnership with governments.

About the Brazilian Development Association (ABDE)

Created in 1969, the Brazilian Development Association (ABDE) brings together the 34 institutions of the National Development System (NDFS), present throughout the country – composed of federal public banks, development banks controlled by states of the Federation, cooperative banks, state public commercial banks with a development portfolio, development agencies – in addition to Finep (Brazilian Innovation Agency) and Sebrae. ABDE defines strategies and executes promoting actions for the SNF, through national representation in governmental, social, and productive spheres of Brazil, the production and dissemination of studies, and the promotion and dissemination of various types of courses and activities, with the constant objective of improving the performance of its members in the efficient and accessible financing of Brazilian development.

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The AFD Group helps implement France's sustainable development and international solidarity policies. Composed of the Agence Française de Développement (AFD), which finances the public sector and NGOs, research, and training; its subsidiary Proparco, which finances and supports the private sector; and Expertise France, a technical cooperation agency, the Group finances, supports, and accelerates the transitions necessary for a fairer and more resilient world. With and for people, we work with our partners to create shared solutions in more than 150 countries, as well as in 11 French overseas departments and territories. Our goal? To reconcile economic development with the preservation of common goods: climate, biodiversity, peace, gender equality, education, and health. Our teams are involved in more than 4,200 projects, contributing to France's commitment to the Sustainable Development Goals (SDGs). #CommonWorld. https://www.afd.fr/en

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List of Abbreviations and Acronyms

ABDE	Brazilian Development Association
ABVCAP	Brazilian Private Equity and Venture Capital Association
AFD	French Development Agency
AMABIO	Sustainable Investments Financing Support Program for the Implementation of the Franco-Brazilian Bioeconomy Initiative
ATER	Technical Assistance and Rural Extension
B2B	Business to Business
Banpará	Bank of the State of Pará
BASA	Bank of Amazon
BB	Bank of Brazil
BCB	Central Bank of Brazil
BID	Inter-American Development Bank - IDB
BMO	Bank of Montreal
BNDES	Brazil's Economic and Social Development National Bank
CAF	Registry of Family Farmers (Cadastro de Agricultor Familiar)
CAR	Rural Environmental Registry (Cadastro Ambiental Rural)
CBIOs	Decarbonization Credits
CIR	Indigenous Council of Roraima
CLUA	Climate and Land Use Alliance
CNPJ	National Registry of Legal Entities
CNS	National Council of Extractive Populations
Coiab	Coordination of Indigenous Organizations of the Brazilian Amazon
Conexsus	Sustainable Connections Institute
Coopaflora	Mixed Cooperative of Traditional Peoples and Communities of the Calha
COP	Norte Region
CPR	Conference of the Parties
CRA	Rural Product Certificate
CVC	Agribusiness Receivables Certificate
DAP	Corporate Venture Capital
Embrapii	Declaration of Aptitude for Pronaf
ENB	Brazilian Company for Industrial Research and Innovation
FAO	Food and Agriculture Organization of the United Nations - FAO
FAPs	State Research Support Foundations
Fiagro	Investment Fund in Agroindustrial Production Chains
FIDA	International Fund for Agricultural Development - IFAD
FINEP	Brazilian Innovation Agency
FIRN	Rio Negro Indigenous Fund
FNO	Constitutional Financing Fund for the North Region
FOIRN	Federation of Indigenous Organizations of Rio Negro
FSC	Forest Stewardship Council
G20	Group of Twenty
GBS	Global Bioeconomy Summit
GCF	Green Climate Fund
GEF	Global Environment Facility

GIB	G20 Initiative on Bioeconomy
GIZ	German Society for International Cooperation
IA	Artificial Intelligence
IACGB	International Advisory Council on Global Bioeconomy
IBAMA	Brazilian Institute of the Environment and Renewable Natural Resources
ICS	Climate and Society Institute
ICTs	Science and Technology Institutions
Idesam	Institute for Conservation and Sustainable Development of the Amazon
ILPF	Crop-Livestock-Forest Integration
Imaflora	Institute for Forest and Agricultural Management and Certification
INCRA	National Institute for Colonization and Agrarian Reform
IoT	Internet of Things
ITERs	State Institutes of Technology and Education
KPIs	Key Performance Indicators
LSE	Socioeconomic Survey
MMA	Ministry of Environment and Climate Change
OCDE	Organization for Economic Co-operation and Development
ODS	Sustainable Development Goals
ONGs	Non-Governmental Organizations
ONU	United Nation
PE	Private Equity
PGTA	Territorial and Environmental Management Plans
PNDBio	National Bioeconomy Development Plan
PNGATI	National Policy for the Environmental and Territorial Management of Indigenous Lands
PNMC	National Policy on Climate Change
PPA	Partners for the Amazon Platform
PPBio	Priority Bioeconomy Program
Pronaf	National Program for Strengthening Family Farming
PSA	Payment for Environmental Services
SAFs	Agroforestry Systems
Sebrae	Brazilian Micro and Small Business Support Service
Sebraetec	Sebrae's Innovation and Technology Service
SGA	Socio-Environmental Management System
SINAFLOR	National System for Control of the Origin of Forest Products
SNF	National Development System
UE	European Union
USAID	United States Agency for International Development
USDA	U.S. Department of Agriculture
VC	Venture Capital
WWF	World Wide Fund for Nature

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ABSTRACT

This study aims to analyze the challenges and opportunities for financing the bioeconomy in the Legal Amazon, with special attention to the sociobioeconomy, understood as the branch based on the valorization of sociobiodiversity, traditional knowledge, and sustainable ways of life of Indigenous peoples, traditional communities, and family farmers.

The results indicate that, although there is a diversity of mechanisms and actors involved, the financing ecosystem for the bioeconomy remains fragmented, poorly adapted to Amazonian realities, and in need of expanding accessible instruments for the sociobioeconomy (approximately 28% indicate potential use by local communities). The study also identified the central role of public funding, the significant contribution of national philanthropic organizations, and the potential of innovative operational arrangements such as structured guarantees, hybrid funds, and territorial hubs.

Among the main contributions of the study are the construction of a systematized database, the analytical distinction between bioeconomy and sociobioeconomy, and the proposal of an agenda for further research, including analysis of disbursed amounts, impact assessment, development of specific indicators, and the creation of an interactive public database. The study seeks to support public policies and financing strategies that are more inclusive, territorialized, and aligned with the challenges and potentials of the bioeconomy in the Legal Amazon.

Keywords: bioeconomy; sociobioeconomy; financing; Legal Amazon; territorial development; public policies.

EXECUTIVE SUMMARY

This study aims to understand the challenges and opportunities for bioeconomy financing in the Legal Amazon, with special emphasis on sociobioeconomy – that is, initiatives based on the valorization of sociobiodiversity, led by Indigenous peoples, traditional communities, and family farmers. To this end, the study employed an integrated approach involving: (i) critical analysis of the concept of bioeconomy and its different territorial expressions; (ii) literature review on bioeconomy financing in the region; (iii) mapping of 159 financial mechanisms; (iv) survey of 111 institutions operating in Legal Amazon, with a proposed institutional typology; (v) case studies and interviews with key actors; (vi) formulation of recommendations to improve the financial ecosystem; and (vii) presentation of conclusions, limitations, and a proposed agenda for future research.

Among the main findings, the study identified that the bioeconomy financing ecosystem in Amazon is marked by great institutional and instrumental diversity, but still suffers from fragmentation, access asymmetries, low territorial adaptation, and a need to expand specific mechanisms for the sociobioeconomy. About 23% of the mapped mechanisms are exclusive to bioeconomy and 28% serve local communities, with 13% referring to instruments exclusive to community-based bioeconomy. Public banks and development agencies concentrate the largest number of operational mechanisms, highlighting their structuring role, while national philanthropic organizations stand out for their territorial capillarity and alignment with socio-environmental objectives. On the other hand, mechanisms operated by investment funds and international philanthropic organizations showed lower adherence to Amazonian specificities.

The analysis of the case studies highlighted concrete examples of innovative financial and operational arrangements, such as the use of structured guarantees by Banco da Amazônia (BASA), the territorial hubs created by Banco do Brasil (BB), the adapted microcredit of Banco do Estado do Pará (Banpará), and the acceleration platform of Inova Amazônia by Serviço Brasileiro de Apoio às Micro e Pequenas Empresas (Sebrae). Such experiences show that territorialized, multi-sectoral approaches articulated with local agents are more effective in expanding access to financing for sociobioeconomy enterprises. However, the persistence of bottlenecks such as land tenure informality, low technical assistance in remote areas, and the absence of impact metrics adapted to the territories impose limits on the scalability and sustainability of these initiatives.

Based on these findings, the study proposes a set of structural recommendations aimed at improving the financial ecosystem as a whole—including the creation of a national bioeconomy financing strategy, the strengthening of technical assistance, the development of innovative guarantee models, the creation of a public information platform, and the adoption of specific socio-environmental impact metrics. Furthermore, it formulates specific recommendations for the sociobioeconomy, such as the development of dedicated financial instruments, the valorization of ecosystem services, support for community organizations, the promotion of

territorial financing arrangements, and the prioritization of land regularization as a condition for access to credit.

Compared to the existing literature, the study advances in three main directions: (i) it offers an updated database on the mechanisms and institutions active in the Legal Amazon, with a proposed institutional typology; (ii) it adopts the category of sociobioeconomy as an analytical key, allowing it to highlight the challenges and solutions for community-based segments; and (iii) it identifies and systematizes examples of innovative solutions already underway, which can inspire new designs for public policies and financial instruments more adapted to Amazonian realities.

Finally, the study proposes an agenda for deepening and strengthening the ecosystem, highlighting the following next steps: (i) analysis of effective financing volumes by type of instrument; (ii) creation of a public, interactive, and updated database with the mapped mechanisms; (iii) effectiveness studies and impact assessment of the instruments; (iv) investigation of informal and community-based forms of financing not captured by the survey; (v) specific analyses of innovative financial instruments adapted to the sociobioeconomy; and (vi) participatory development of specific key performance indicators to measure the impacts of these enterprises. Thus, the study not only consolidates a comprehensive and action-oriented diagnosis but also paves the way for the continuous improvement of financing strategies that intend to leverage a fairer, more sustainable development model rooted in the Amazon's knowledge and territories.

1.

THE BIOECONOMY CONCEPT

Establishing the bioeconomy conception that guides this study requires recognizing that this is a contested concept, often mobilized in different contexts and by distinct socioeconomic groups. While the promotion of bioeconomy has been presented as a strategy for solving complex and varied problems, such as global warming or food and energy security, the dissent surrounding its meaning can make its objectives and results competing or even incompatible. Given this, this section is dedicated to exploring, comprehensively and non-exhaustively, the debate about the bioeconomy concept based on different nuances and typologies proposed by the literature.

A first differentiation can be identified around definitions that are prevalent in advanced economies, where the first conceptions of bioeconomy emerged, and those that have been developed according to developing countries' reality and, particularly, to the Amazon context.

In North America and Western Europe, different bioeconomy concepts tend to emphasize the reconciliation between economic growth and environmental sustainability within the frameworks of the market economy (Lesenfants et al., 2024). This translates into definitions from governments and multilateral organizations that, in turn, guide access to bioeconomy financing within their respective jurisdictions. Box 1 below presents some of these definitions.

Box 1
Some bioeconomy concepts

Institution	Concept
European Commission	**Sectoral Emphasis:** All economic sectors dependent on biological resources. **Central Objectives:** Circular and sustainable economy. **Definition:** Bioeconomy encompasses all sectors and systems that depend on biological resources (animals, plants, micro-organisms, and derived biomass, including organic waste), their roles and principles. It includes and interlinks: terrestrial and marine ecosystems and the services they provide; all primary production sectors that use and produce biological resources (agriculture, forestry, fisheries and aquaculture); and all economic and industrial sectors that use biological resources and processes to produce food, feed, bio-based products, energy and services. European bioeconomy must have sustainability and circularity as central elements.
Global Bioeconomy Summit (GBS), International Advisory Council on Global Bioeconomy (IACGB) and Food and Agriculture Organization of the United Nations (FAO)	**Sectoral Emphasis:** All economic sectors. **Central Objectives:** Sustainable economy. **Definition:** Bioeconomy is the production, utilization, conservation, and regeneration of biological resources, including related knowledge, science, technology, and innovation, to provide sustainable solutions within and across all economic sectors and to enable a transformation towards a sustainable economy.
Organization for Economic Co-operation and Development (OECD)	**Sectoral Emphasis:** Primary production and biotechnology-based industry. **Central Objectives:** Technological innovation focused on industrial and energetical biotechnology applications; sustainable economy implicit. **Definition:** Bioeconomy is the set of economic activities in which biotechnology contributes centrally to primary production and industry, especially where advanced life sciences are applied in the conversion of biomass into materials, chemicals, and fuels.
Germany	**Sectoral Emphasis:** All economic sectors. **Central Objectives:** Sustainable economy. **Definition:** Bioeconomy is the production and use of knowledge based biological resources to provide products, processes, and services in all economic sectors within a sustainable economic system.

Institution	Concept
U.S. Department of Agriculture (USDA)	**Sectoral Emphasis:** Infrastructure, innovation, technology, production, and data related to biological processes and sciences. **Central Objectives:** Economic growth, improvements in public health, agricultural and security benefits; no explicit or implicit connection to a sustainable economy. **Definition:** Bioeconomy represents the infrastructure, innovation, products, technology, and data derived from biologically related processes and sciences that drive economic growth and improve public health and agricultural and security benefits.
Stockholm Environment Institute	**Sectoral Emphasis:** All economic sectors. **Central Objectives:** Sustainable economy and lower environmental impact. **Definition:** Bioeconomy is seen as a transformative approach that integrates biological processes and renewable resources into economic activities, aiming for sustainability and lower environmental impact.

Sources: European Commission (2024), FAO (2024), Baden-Württemberg (2024), U.S. OSTP (2019), OECD (2018), "Global Bioeconomy Summit 2018 -- Conference Report" (2018), Diemer et al. (2021).

In the Brazilian case, it is therefore necessary to reflect on the manifestation of benefits and limitations from applying concepts prevalent in advanced economies, considering the social, economic, and environmental challenges of the country. This analytical exercise is developed in the next two sections.

* * * *

1.1 Application of Advanced Economies Prevalent Concepts to the Brazilian Reality

The European Union (EU) vision on bioeconomy applied to Brazil involves both seizing opportunities and facing significant challenges. The European Commission's definition emphasizes a combination of agriculture, forestry, fisheries, and biotechnology, prioritizing biological resources, such as biomass and renewable materials. It integrates non-biological sectors, such as energy and manufacturing, highlighting environmental sustainability by reducing dependence on fossil fuels and mitigating climate change. Social aspects include job creation and rural development, while economic viability balances economic growth with ecological and social considerations. Biotechnology is highlighted, with an emphasis

on digital technologies for process optimization. This definition benefits industries, governments, and local communities, aligning with the United Nations (UN) Sustainable Development Goals (SDGs) and promoting public participation. In the Brazilian context, the use of this definition would benefit from the reconciliation between sustainability and economic diversification, leveraging from the country's rich biodiversity and robust agricultural sector. Conversely, the risk of perpetuating extractivist practices, which could exacerbate social inequalities and environmental degradation, would be its potential weakness (Mittra & Zoukas, 2020; Ferraz; Pyka, 2023).

The German Government's definition emphasizes agriculture, forestry, and biotechnology, focusing on biological resources, processes, and systems. It encompasses all economic sectors within a sustainable framework, highlighting sustainability and climate neutrality. Social aspects include social interests and rural development, balancing economic growth with sustainability. Advanced biotechnologies and traditional knowledge systems are integrated, benefiting industries, governments, and local communities. This definition also aligns with the UN SDGs and assumes public and stakeholder engagement. In Brazil, its use would be convenient due to its focus on sustainability and the integration of traditional knowledge, which can enhance conservation efforts.

The Organization for Economic Co-operation and Development's (OECD) definition focuses on biotechnology and biomass, emphasizing biological resources and biotechnology. It includes primary production, health, and industry, addressing environmental challenges and sustainability. Social aspects are limited, with its main focus being on economic growth through biotechnology. Technological advances are considered, but traditional knowledge systems are not integrated. By applying this concept, Brazil could benefit from the relevance attributed to technological innovation, which can drive economic growth. Its limited attention to social equity and environmental sustainability, however, could hinder addressing the country's social and ecological challenges (Wei et al., 2022).

Stockholm Environment Institute's definition emphasizes agriculture, forestry, and fisheries, focusing on biological resources and sustainability. It includes all economic sectors, highlighting sustainability and environmental impact reduction. Social equity and sustainable development are key aspects, balancing economic, ecological, and social objectives. Biotechnology and innovation are emphasized, as well as traditional knowledge systems. This definition benefits local communities, contributes to the SDGs achievement, and promotes public participation. In Brazil, the strengths of its use relate to the sustainability and social equity protagonism, which would favor inclusive growth. In contrast, its implementation could face challenges related to political and governance issues (Ramcilovic-Suominen, 2023).

The U.S. Department of Agriculture's (USDA) definition emphasizes agriculture and biotechnology, focusing on biological resources and biomanufacturing. It covers various sectors, such as health, energy, and food security, addressing environmental sustainability

and resilience. Social aspects encompass rural development and social equity, balancing economic growth with sustainability. Biotechnology and biomanufacturing are highlighted, focusing on modern scientific approaches. This definition benefits industries, governments, and local communities, promoting public participation. In Brazil, the strength of its application would be the focus on technological innovation and economic growth. However, its limited attention to traditional knowledge and social equity could not effectively address Brazilian social and ecological challenges (Ramcilovic-Suominen, 2023).

The Food and Agriculture Organization of the United Nations (FAO) and the International Advisory Council on Global Bioeconomy (IACGB) adopt the Global Bioeconomy Summit's broad definition of bioeconomy, which includes agriculture, forestry and fisheries, focusing on biological resources and related knowledge, and integrates all economic sectors, emphasizing environmental sustainability and food security. Social aspects include rural development, balancing economic, ecological, and social objectives. Biotechnology and innovation are highlighted, along with traditional knowledge systems. This definition tends to benefit local communities and is aligned to climate and environmental goals. In Brazil, the strength of its application would lie in its focus on food security and rural development, which are crucial themes in addressing its social disparities (Johnson et al., 2022; Vezzoni; Ramcilovic-Suominen, 2023; Ramcilovic-Suominen; Kröger; Dressler, 2022).

* * * *

1.2 Global Bioeconomy Summit Definition's Scope and Its Relevance for Brazil

As shown in Box 1, **the Global Bioeconomy Summit's definition is the most comprehensive, as it balances economic, ecological, and social objectives, integrates traditional and modern knowledge systems, and emphasizes public participation and understanding.** This holistic approach ensures that bioeconomy practices are sustainable, equitable, and beneficial for all stakeholders, so it would potentially align with Brazil's unique challenges. Applying the comprehensive definition of the Global Bioeconomy Summit to Brazil involves leveraging the country's rich biodiversity and natural resources, while simultaneously addressing significant social and environmental challenges. This definition emphasizes the production, use, conservation, and regeneration of biological resources, while integrating knowledge, science, technology, and innovation to provide sustainable solutions across all economic sectors.

There are existing policies in Brazil, such as the National Policy on Climate Change (Política

Nacional sobre Mudanças Climáticas - PNMC) and the Forest Code (Código Florestal), which support sustainable land use and conservation efforts. Their implementation, however, faces challenges related to political instability and enforcement difficulties. Bioeconomy is still structuring itself in Brazil, with initiatives like the National Bioeconomy Strategy (Estratégia Nacional de Bioeconomia - ENB) seeking to integrate sustainable practices into various sectors. Socially, the country suffers from significant social disparities, with a large portion of its population living in poverty, especially in rural areas. Indigenous communities and small farmers, who play a crucial role in biodiversity conservation and sustainable land management, often face marginalization and lack of access to resources and decision-making processes. Nature conservation is critical, given Brazil's status as home to most of the Amazon rainforest, one of the planet's most biodiverse biomes. However, deforestation driven by agricultural expansion, illegal logging, and mining activities remain significant challenges.

Applying and developing the Global Bioeconomy Summit's comprehensive definition in Brazil would require integrating sustainable practices into all economic sectors, including agriculture, forestry, fisheries, and biotechnology. This would involve prioritizing the use of biological resources and related knowledge to create sustainable solutions, reducing environmental impact, promoting social equity, and ensuring economic viability. A national bioeconomy strategy aligned with this concept would have to emphasize environmental sustainability, promoting practices that reduce carbon footprints, preserve biodiversity, and regenerate ecosystems. This would require the adoption of agroecological practices, sustainable forest management, and conservation agriculture. Simultaneously, the adoption of policies supporting the restoration of degraded lands and the protection of natural habitats, aligned with the objectives of the National Policy on Climate Change and the Forest Code, would be essential.

Addressing social disparities is crucial for promoting bioeconomy in the Brazilian context. This process must prioritize the inclusion of Indigenous communities, small farmers, and other marginalized sector, ensuring these groups have decision-making participation and access to resources, education, and training to build local capacity and guarantee that the bioeconomy benefits are distributed equitably. Social equity can be enhanced by supporting community initiatives and promoting fair trade practices.
Furthermore, balance between economic growth and ecological and social considerations is essential. Bioeconomy must create new economic opportunities, especially in rural areas, by promoting sustainable industries, such as ecotourism, organic agriculture, and bio-based product manufacturing. Investments in research and development are crucial to foster innovation and adapt bioeconomic technologies to Brazil's unique environmental and social contexts.

Biotechnology and innovation must also play a central role in bioeconomy. Brazil should invest in modern biotechnological approaches, such as genetic engineering and synthetic biology, while simultaneously integrating traditional knowledge systems. Digital technologies, such as Artificial Intelligence (AI) and Internet of Things (IoT), can optimize biological processes

and improve sustainability. Collaboration between research institutions, industry, and local communities is fundamental to drive technological advances that produce new products and processes based on national biodiversity and knowledge, while ensuring a fair distribution of the economic benefits of these innovations.

Finally, it is necessary to disseminate the diagnosis that public understanding and participation are vital for the success of bioeconomy. Awareness campaigns and educational programs can engage the public and promote sustainable practices. Policies must align with the SDGs and support a holistic approach to sustainability. Strong governance frameworks are needed to ensure transparency, accountability, and effective implementation of bioeconomy initiatives.

* * * *

1.3 Bioeconomy Concept Re-signified for the Reality of Developing and Emerging Countries, Specifically Applied to Brazil

The bioeconomy concept has been re-signified when applied to developing and emerging countries and, specifically, those within the Amazon biome. In this case, the concern for biodiversity conservation and the well-being of local communities has taken center stage. This has led to the frequent literature diagnosis that not all bioeconomy is necessarily environmentally sustainable (Tan; Lamers, 2021). Furthermore, the term is often used to mask environmentally condemnable practices – a practice called greenwashing (Bergamo et al., 2022).

Considering these nuances, studies have been identifying and systematizing bioeconomy into its different strands. For example, two convergent typologies are proposed by Bugge, Hansen and Klitkou (2016) and Queiroz-Stein et al. (2024). In the first, different types are understood in biotechnology, bio-resources, and bio-ecology terms. The second systematization identifies a conventional bioeconomy, a biodiversity economy, and a sociobiodiversity-based bioeconomy. In both cases, there is a significant correspondence between the three identified categories.

The biotechnology perspective, according to Bugge, Hansen and Klitkou (2016), bears similarity to the idea presented by Queiroz-Stein et al. (2024) as conventional bioeconomy. Both highlight the central role of biotechnology and applied science as drivers of economic development, often being associated with the expansion of agricultural monocultures and corporate actors. In turn, the bio-resources view, which explores the harnessing of biological

raw materials and the establishment of new value chains, presents points of convergence with the biodiversity economy. These two categories recognize the economic value of biological resources and ecosystems, emphasizing the creation of market mechanisms, such as payments for ecosystem services and bio-trade. Finally, the notion of bio-ecology, which promotes the optimization of ecological processes and environmental conservation, corresponds to the sociobiodiversity bioeconomy. Both cases refer to practices based on sustainability and respect for biodiversity. However, the sociobiodiversity bioeconomy goes further, by integrating social and cultural dimensions, valuing traditional knowledge and the rights of local communities as a central part of its conception.

To contemplate varied approaches, such as those presented, studies on bioeconomy financing in Brazil have been opting to define it broadly. The conception adopted by Chiavari et al. (2024) understands bioeconomy as a productive model based on the use of biological and renewable resources to produce food, energy, inputs, materials, and other goods and services, encompassing sectors such as agriculture and extractivism of native crops, planted forests, biotechnology, bio-products, bioenergy, and biofuels. Nature Finance (2024) includes everything from traditional local and small-scale production practices to large-scale and transnational economic activities, including technology-intensive economic activities, in its scope. In this scenario, the identification of a “nature-intensive bioeconomy” is made, which includes primary production and the use of biological resources, such as agriculture, forestry, and fisheries; an “advanced bioeconomy,” which integrates modern scientific knowledge and technological advances to improve efficiency and sustainability; and a “high-tech bioeconomy,” which leverages advanced technologies such as synthetic biology, genomics, and bioinformatics to create innovative products and services.

Regarding the Legal Amazon reality, the variants of bioeconomy appear associated with aspects of its regionalization. The Amazônia 2030 initiative (Veríssimo et al., 2023) proposes a typology that divides the region into five zones, each with distinct ecological, economic, and social characteristics:

Box 2
The five zones of the Legal Amazon according to the Amazônia 2030 initiative

Amazon region	Characteristics
Forest Amazon	• Covers 39% of the Legal Amazon territory • Refers to conserved forest areas, located mainly in Amazonas and Pará states
Forest Amazon under pressure	• Corresponds to 29% of the Legal Amazon territory • Encompasses municipalities with extensive forest cover, but suffering from growing deforestation, illegal logging, gold mining, and land grabbing
Deforested Amazon	• Represents 11% of the total area of the Legal Amazon • Comprises already deforested areas, mostly abandoned or underutilized
Non-forest Amazon	• Equivalent to 21% of the territory • Dominated by cerrado (savanna) vegetation, concentrated in the states of Mato Grosso, Tocantins, and Roraima
Urban Amazon	• Houses 76% of the population of the Legal Amazon • Refers to Amazonian cities distributed throughout its territory

Source: Own elaboration based on Veríssimo et al. (2023).

These different contexts offer opportunities and challenges for different bioeconomy models to establish themselves in line with their particularities and potentialities.

Considering this regionalization particularities, Uma Concertação pela Amazônia (2021, 2023) proposes three approaches present bioeconomies in the Legal Amazon. The first, based on its sociobiodiversity and traditional communities' knowledge valorization in more conserved forest regions, can be understood as sociobiodiversity bioeconomy or sociobioeconomy. The second, anchored in the idea of forest management, both in preserved areas and in transition areas, should be understood in terms of a forest bioeconomy. The third, aimed at areas with extensive commodity production, can be called commodity bioeconomy or agro-bioeconomy. Box 3, below, summarizes the main characteristics of these three types of bioeconomy.

Box 3
Typology of bioeconomies of Legal Amazon

Bioeconomy model	Main characteristics
Sociobioeconomy or sociobiodiversity bioeconomy	Based on the valorization of Amazonian sociobiodiversity. Its development is indicated for more conserved forest regions, where a significant percentage of traditional populations and communities reside. These groups develop extractive, fishing, and agriculture activities for self-consumption and commercialization in local and institutional markets. They are organized in areas with a low degree of anthropization and their livelihoods depend on natural resources and play a relevant role in maintaining biodiversity.
Forest bioeconomy	It is anchored in the forest management idea and can be developed both in preserved regions and transition areas. Silviculture of native forests, production of certified seedlings and planting of natives, restoration of degraded areas, integrated Crop-Livestock-Forestry (ILPF) systems and agroforestry systems (SAFs) are activities developed in this context. They occur in areas with a medium degree of anthropization and have a medium dependence on biodiversity.
Agro-bioeconomy or commodity bioeconomy	It is based on intensive production and should be applied in areas with extensive commodity production. These areas are observed in various regions of the Amazon and exert great pressure on the forest. They are monoculture or planted forests areas that use techniques from industrial agriculture. Commodity production occurs in areas with a high degree of anthropization and has low dependence on biodiversity. In fact, these activities are recognized as a threat to local biodiversity and the health of neighboring communities due to the excessive use of pesticides. In these areas, the adoption of environmentally and socially sustainable practices to reduce negative externalities is a key point.

Source: Uma Concertação pela Amazônia (2023, p. 16).

This typology can be used to analyze the application of bioeconomy conceptions to the Brazilian and Amazonian reality. For example, when instituting the National Bioeconomy Strategy, the federal government defined bioeconomy as:

> the model of productive and economic development based on values of justice, ethics, and inclusion, capable of generating products, processes, and services, efficiently, based on the sustainable use, regeneration, and conservation of biodiversity, guided by scientific and traditional knowledge and their innovations and technologies, with a view to adding value, generating work and income, sustainability, and climate balance (BRASIL, 2024, p. 1).

Thus, given the presence of elements such as biodiversity conservation and valorization of traditional knowledge in the definition, the influence of the sociobioeconomy approach on the government decree becomes evident.

On the other hand, the importance given to science application – which includes the knowledge of local communities – announces the cross-cutting treatment that should be given to this issue, probably seeking to overcome interpretations that attribute the application of biotechnology to large corporate actors. This offers us clues about the National Bioeconomy Plan (Plano Nacional de Bioeconomia) to be presented in the near future, which should guide relevant processes for both the development of the sociobioeconomy sector and the creation and development of knowledge-intensive production chains, without neglecting financing strategies and performance indicators.
Within the scope of the G20, bioeconomy became the object of a multilaterally agreed document, which establishes ten high-level principles for its development.Of a voluntary and non-binding nature, they point to the need for a bioeconomy that promotes sustainable development, that is inclusive and equitable, contributes to biodiversity conservation, is based on country-specific approaches, and is guided by science, technology, and traditional knowledge, among other elements that fall within the orbit of sociobioeconomy (GIB, 2024).

This conception aligns with the diagnosis of academic studies on the nexus between bioeconomy and Amazonian biodiversity. For example, Mazzucato and Braga (2024) observe that the association between traditional knowledge and technological advances will be fundamental for the development of the Amazonian bioeconomy, which means that traditional "top-down" economic models are insufficient to meet the demands of a region so socially and biologically diverse. Nobre et al. (2023, p. 24), when proposing a "New Economy for the Amazon", **point to the need for a bioeconomy that develops with the forest standing and rivers flowing, where tradition and innovation are the basis of economic activities that do not harm ecological balances and the health of the biome.** As the authors indicate, this sociobioeconomy already exists, mobilizing an annual gross production value of R$15 billion in Legal Amazon. This occurs despite difficulties related to its high informality rate and the inadequacy of official methods in capturing indicators. This near invisibility of the Amazonian sociobioeconomy is also examined by Vieira et al. (2024), who observe that its scaling should be achieved through the accumulation of various small initiatives, and not through a few large monocultures. This scenario can be illustrated by the experience of the uncontrolled expansion of açaí and cocoa cultivation, which has taken on environmentally unsustainable proportions and threatens the ecosystemic and social balance of Amazon regions.

In summary, the wide variety of definitions and approaches related to bioeconomy reflects both its conceptual complexity and the diversity of contexts in which it is applied. Considering its objectives and focus on the Legal Amazon, this study will conceive bioeconomy in a broad sense, without ignoring the different forms in which it presents itself in the region: agro-bioeconomy, forest bioeconomy, and sociobioeconomy. This approach recognizes that these bioeconomies have specificities in terms of resources used, actors involved, and expected impacts related to their financing. **Recognizing these nuances will, therefore, be essential to understanding the ecosystem of Amazonian bioeconomy financing.**

2.

LESSONS FROM LITERATURE

Bioeconomy has established itself as one of the main strategies for reconciling environmental conservation, income generation, and sustainable development in the Legal Amazon. However, the success of initiatives in this field depends on a series of **structural, financial, institutional, and sociocultural factors** that need to be understood in depth.

This chapter presents a critical synthesis of recent literature on the topic, with the objective of identifying the main factors that drive or limit the financing and implementation of bioeconomy projects in the region. The analysis contemplates the elements that have favored the success of certain initiatives as well as the recurring bottlenecks that still hinder their consolidation and scalability.

Furthermore, the chapter brings together the main recommendations formulated by previous studies for building a more favorable institutional, regulatory, and financial environment for the advancement of the Amazonian bioeconomy. **By consolidating this knowledge, we seek to not only map the current stage of sector development in Brazil but also ensure that the present study adds in a complementary – and not redundant – way to the existing body of knowledge, contributing new perspectives and depth.**

* * * *

2.1. What Leads to the Success of Bioeconomy Projects?

The analyzed studies indicate that the success of bioeconomy initiatives in the Legal Amazon is conditioned on the articulation of multiple factors that, together, create an environment conducive to attracting investments, economic sustainability, and socio-environmental conservation. These factors range from the design and implementation of structured public policies to the valorization of traditional knowledge, including aspects such as community governance, financial innovation, technical assistance, certification, and territorial adequacy of strategies.

In general, the studies converge on the finding that **successful projects tend to combine adequate financial instruments with inclusive institutional arrangements, sustainable productive practices, valorization of sociobiodiversity, and qualified insertion in differentiated markets. The main success factors identified in the literature are presented below:**

Box 4

Success factors in bioeconomy projects identified in the literature

Success factor	Description
Support and direction from public policies	• Public policies such as rural credit and public policies decarbonization credits (CBIOs) create favorable conditions for investment. The role of the Brazilian Development Bank (Banco Nacional de Desenvolvimento Econômico e Social - BNDES) and multilateral banks is central in providing accessible credit, structuring projects, and articulating strategic actors (Chiavari et al., 2024 and Pamplona; Salarini; Kadri, 2021).
Innovative financial instruments	• Thematic bonds and CBIOs represented 56% of total bioeconomy financing between 2021 and 2023, evidencing the potential of these mechanisms to attract capital and reduce financial risks (Chiavari et al., 2024).
Community governance and socio-productive organization	• Experiences such as the açaí, cocoa, and pirarucu (giant arapaima) chains demonstrate that the active participation of producers and the presence of collective structures, such as cooperatives and meta-organizations, strengthen governance and the capacity to raise resources (Marcovitch; Val, 2024 and Saes et al., 2023).
Technical assistance and articulation	• Support from NGOs, universities, and public institutions provides technical assistance, strengthens local capacities, and articulates partnerships, being essential for enabling sustainable and inclusive projects (Pinsky; Marcovitch; Val, 2024 and Marcovitch; Val, 2024).
Sustainable practices and certifications	• Sustainable management and the adoption of socio-environmental certifications, as in the cases of pirarucu and cocoa, enable access to premium markets and attract funders. Agroforestry systems have proven to be economically more stable and environmentally safer (Marcovitch; Val, 2024).
Valorization of sociobiodiversity and traditional knowledge	• The integration of local knowledge and the valorization of sociobiodiversity strengthen the protagonism of communities and generate products with higher added value and cultural recognition (Saes et al., 2023 and Lopes; Chiavari, 2022).
Short chains and fair trade	• Models that eliminate intermediaries, such as "bean to bar" in the cocoa chain and the Origens Brasil initiative, promote direct commercial relations, economic justice, and greater return to local producers (Marcovitch; Val, 2024).
Technological innovations	• The use of freezing and processing techniques improves the non-seasonal commercialization of products. The domestication of native species increases productivity and reduces pressures on natural ecosystems (Silva et al., 2025).
Regional adequacy of bioeconomy strategies	• The Amazon is not homogeneous: different territories require distinct approaches. In conserved and under-pressure areas, models based on agroecology and valorization of the standing forest are more effective. In urban zones, the potential for research hubs and high-tech industrial poles stands out (Lopes; Chiavari, 2022).

Source: Own elaboration.

[1] O estudo de Chiavari et al. (2024), que embasa esse dado, adota uma definição ampla de bioeconomia, incluindo setores como biocombustíveis e florestas plantadas. Essa abordagem difere do foco deste estudo, mais centrado na sociobioeconomia da Amazônia Legal.

Among the analyzed factors, the following stand out:

I. **the strengthening of public policies and innovative financial instruments directed towards sociobiodiversity,**
II. **the existence of consolidated and organized community governance structures,**
III. **the presence of qualified technical assistance and institutional articulation,**
IV. **the valorization of traditional knowledge and the socio-environmental diversity of the region and**
V. **the sustainable management of natural resources and socio-environmental certification.**

These elements were the most recurrent in the reviewed literature and were also associated with better results in case studies. They not only **increase the attractiveness of projects for investors but also amplify their economic viability, social legitimacy, and capacity to generate lasting benefits for local communities.**

* * * *

2.2. What Makes Bioeconomy Projects Unviable or Weakens Them?

Despite the transformative potential of the bioeconomy in the Legal Amazon, various structural and institutional obstacles still limit the scale, efficacy, and sustainability of the initiatives implemented in the region. **The literature points out that factors such as the absence of adequate financing, institutional disarticulation, precarious infrastructure, legal insecurity, and devaluation of traditional knowledge compromise the economic, social, and environmental viability of projects, in addition to deterring investors.**

Box 5, below, summarizes the main factors that contribute to the failure or fragility of bioeconomy projects in the Legal Amazon, as identified in the literature.

Box 5

Failure factors in bioeconomy projects identified in the literature

Failure factor	Description
Low financing and absence of adapted instruments	According to Chiavari et al. (2024), between 2021 and 2023, the sectors of planted forests and bioenergy and biofuels concentrated about 74% of bioeconomy resources in Brazil. In contrast, only 9% were destined for sociobiodiversity products, while Family agriculture received 8%, native forests 6%, and transversal public policies received 3%. The study also identified a concentration in a single instrument, rural credit, responsible for 99% of the total directed to this sector. Furthermore, only 12% of resources aimed at sociobiodiversity products were destined for the North Region, only behind the Center-West (11%). Difficulties in obtaining specific financing for equipment purchase and expansion of operations (Saes et al., 2023).
Lack of sustainability criteria and impact metrics	Absence of clear indicators and evaluation systems limits the demonstration of positive impacts, hindering access to markets and funding sources (Saes et al., 2023 and Pinsky; Marcovitch; Val, 2024).
Inadequate and disarticulated governance	Lack of coordination between ministries and institutions; the absence of the Ministry of Environment (Ministério do Meio Ambiente - MMA) in debates on bioeconomy weakens the formulation of integrated and effective policies (Lopes; Chiavari, 2022).
Unstructured and informal productive chains	Unorganized productive chains make risk assessment difficult for financial institutions, limiting access to credit (STCP, 2023).
Dependence on public financing and scarce venture capital	Emerging sectors depend heavily on limited public resources and scarce venture capital, facing difficulties in attracting conventional private investments. This compromises the sustainability and scalability of initiatives (Chiavari et al., 2024).
Limited transparency in private financial data	Scarcity of data on private capital flows hinders strategic planning and policy formulation for expanding financing (Chiavari et al., 2024).
Institutional void and absence of environmental enforcement	The lack of state presence forces local communities to bear the costs of environmental vigilance, affecting the economic viability of activities (Saes et al., 2023).
Legal insecurity and land conflicts	Land tenure undefinition, coupled with the absence of rights regulation and land grabbing, generates instability and deters investments (Veríssimo et al., 2023 and Lopes; Chiavari, 2022).
Precarious infrastructure	Deficient logistics, lack of energy, inadequate storage, and limited connectivity increase costs and reduce the competitiveness of bioeconomy products (Silva et al., 2025 and Marcovitch; Val, 2024).
Difficulties in certification and traceability	The high cost and low technical capacity to obtain certifications compromise access to premium markets and limit the products valorization (Silva et al., 2025 and Pinsky; Marcovitch; Val, 2024).

[2] Refers to the Ministry of the Environment according to the nomenclature in force at the time of the study's publication (2022). The current designation is the Ministry of the Environment and Climate Change (MMA).
[3] The observation refers to the context analyzed by Lopes and Chiavari (2022). Since then, there have been relevant advances, such as the creation of the National Secretariat for Bioeconomy within the Ministry of the Environment and Climate Change (MMA), giving the ministry a more active role in coordinating federal bioeconomy policies.

Low value addition and dependence on intermediaries	Chains such as açaí and cocoa still concentrate gains in processing plants and intermediaries, reducing the margin of local producers and discouraging investments (Marcovitch; Val, 2024).
Lack of technical assistance and professional training	The absence of technical support reduces productivity and product quality, compromising competitiveness and hindering access to credit (Marcovitch; Val, 2024 and Veríssimo et al., 2023).
Disarticulated and poorly participatory public policies	Top-down initiatives, without involvement of local communities, generate policies disconnected from reality and of low effectiveness (Pinsky; Marcovitch; Val, 2024 and Marcovitch; Val, 2024).

Source: Own elaboration.

The failure factors analysis reveals that many correspond directly to the absence or fragility of the elements previously identified as determinants for the success of such initiatives. In other words, where there are no adapted financial instruments, community governance, qualified technical assistance, or public policies aligned with local realities, projects tend to lose economic viability, social legitimacy, and attractiveness for funders.

This association between success and failure reinforces the importance of consolidating and expanding the conditions already recognized as favorable. The absence of organized governance, for example, compromises the structuring of productive chains; the inexistence of directing public policies leaves institutional gaps[4]; and the lack of technical assistance undermines productivity and access to financing. Therefore, the failure factors not only confirm the importance of the success factors but also indicate that their replication is a necessary – though not sufficient – condition for the consolidation of the bioeconomy in the region.

At the same time, the literature also identifies specific barriers that are not explained solely by the absence of positive factors. **Factors such as land tenure insecurity, violence in disputed territories, competition with illegal activities, and low administrative efficiency require broader and more coordinated structural interventions, often outside the direct sphere of the projects.** These challenges reveal the need for a more robust State action in guaranteeing territorial rights, environmental enforcement, and creating a stable and secure business environment.

[4] In this sense, the recent publication of the National Bioeconomy Strategy represents an important advance in building guidelines and signaling the government's commitment to the theme, although its effectiveness depends on institutional articulation within the implementation of the National Plan for Bioeconomy Development (PNDBio) and the incorporation of Amazonian specificities in its elaboration.

2.3. Recommendations from the Literature for Strengthening the Bioeconomy in Legal Amazon

As demonstrated in the previous section, many of the factors that make bioeconomy projects in Legal Amazon unviable or weaken them correspond to the absence of conditions already recognized as determinants for the success of such initiatives. In this sense, **literature not only diagnoses obstacles but also presents a positive agenda for the sector, with recommendations aimed at building a more favorable institutional, financial, and territorial environment.**

Box 6, below, organizes these recommendations in a consolidated manner, grouping them into five major categories: (i) G20 guiding principles, (ii) public policies, (iii) public-private partnerships, (iv) financial incentives, and (v) other structuring strategies. The recommendations are accompanied by their respective sources, allowing the reader to identify the contributions of each analyzed study.

Box 6
Consolidated recommendations for strengthening bioeconomy in Legal Amazon identified in the literature

Category	Recommendations
Guiding Principles (G20)	• It is recommended that national governments, especially those of the G20 and other countries engaged in the transition to the bioeconomy, adopt the 10 high-level principles of the G20 Initiative on Bioeconomy (GIB) as a reference for the formulation of public policies, regulatory frameworks, and partnerships. These principles are voluntary and non-binding but aim to guide bioeconomy activities towards fair and equitable benefit-sharing, sustainable development and consumption, mitigation and adaptation to climate change, social and climate justice, science-based assessment, robust policy frameworks, and international collaboration. (GIB, 2024).

Category	Recommendations
Public Policies	• Encourage the creation of mechanisms like CBIOs and thematic bonds to amplify and diversify financing to underserved sectors and regions (CPI, 2024). • Expand rural credit for sociobiodiversity products, improving sustainability criteria for concession (CPI, 2024; SIMÕES, ALMEIDA e COSTA, 2021). • Strengthen the transparency of private financial flows (CPI, 2024). • Advance in land regularization, including Indigenous lands, quilombola territories, conservation units, and settlements (USP/INPA, 2024; LOPES e CHIAVARI, 2022; VERÍSSIMO, BRITO et al., 2023). • Invest in infrastructure for processing, storage, transport (prioritizing river transport), energy, and connectivity (IFAC, 2025; USP/INPA, 2024; VERÍSSIMO, BRITO, et al., 2023, STCP, 2023). • Promote sustainable certification and support technological innovation and RD&I for access to global markets (IFAC, 2025; COALIZÃO BRASIL CLIMA, FLORESTAS E AGRICULTURA, 2023; LOPES e CHIAVARI, 2022; PAMPLONA, SALARINI e KADRI, 2021). • Expand technical support and training via Technical Assistance and Rural Extension (Assistência Técnica e Extensão Rural - ATER) (USP/INPA, 2024; PINSKY et al., 2024; STCP, 2023). • Implement contextualized policies for the different Amazons with local participation (LOPES e CHIAVARI, 2022; SAES et al., 2023). • Map productive chains, Science and Technology Institutions (Instituições de Ciência e Tecnologia - ICTs), business environment, and funding sources (SIMÕES, ALMEIDA e COSTA, 2021). • Support policies for specific sectors such as meliponiculture (stingless beekeeping), fisheries, restoration concessions, and PSA (USP/INPA, 2024; STCP, 2023). • Integrate the environmental dimension into the educational curriculum (USP/INPA, 2024). Implement a fiscal redistribution policy for sociobiodiversity products (SIMÕES, ALMEIDA e COSTA, 2021). • Alignment between bioeconomy and climate agendas, facilitating access to investments (LOPES, CORLETO e CHIAVARI, 2024). • Creation of Protected Areas in undesignated public forests to obtain revenues from PSA and forest-based businesses under management regimes and non-timber forest products (VERÍSSIMO, BRITO, et al., 2023). • Development of national medium and long-term goals and indicators for monitoring biodiversity results in line with international agreements (STCP, 2023). • Review and expand forest concessions and integrate the National System for Control of the Origin of Forest Products (Sistema Nacional de Controle da Origem dos Produtos Florestais - SINAFLOR) (PINSKY et al., 2024; STCP, 2023). • Improve legislation for traceable and sustainable chains (STCP, 2023).

Category	Recommendations
Public-Private Partnerships (PPPs)	• Expand financial instruments such as CBIOs, Partnerships (PPPs)| thematic bonds, and blended finance for underserved sectors (CPI, 2024; PAMPLONA, SALARINI e KADRI, 2021). • Incentivize private investments in productive chains of underfinanced sectors (CPI, 2024). • Stimulate inclusive and sustainable value chains through partnerships between companies, cooperatives, and communities (USP/INPA, 2024; LOPES, CORLETO e CHIAVARI, 2024; SILVA, SOLIANI et al., 2025). • Develop differentiated markets for sociobiodiversity products, connecting small producers to buyers who value sustainable attributes (USP/INPA, 2024). • Strengthen meso-institutions to fill technical and governance gaps (SAES et al., 2023).
Financial Incentives	• Create specific credit lines and tax incentives for the bioeconomy (CPI, 2024; USP/INPA, 2024). • Expand and facilitate access to international climate funds and PSA mechanisms (CPI, 2024; VERÍSSIMO, BRITO et al., 2023). • Offer working capital and advanced payment strategies (STCP, 2023). • Promote the dissemination of existing funding mechanisms (STCP, 2023).
Other Structuring Strategies	• Foster exchanges and teacher training for environmental education and development of bioeconomy (USP/INPA, 2024). • Set up a database, advisory, and specific technical assistance for sociobiodiversity (SIMÕES, ALMEIDA e COSTA, 2021). • Support sustainable tourism and public policies for ecotourism (USP/INPA, 2024; STCP, 2023). • Broaden the scope of the National Bioeconomy Strategy to contemplate different visions (LOPES, CORLETO e CHIAVARI, 2024). • Adopt experimentalist governance and the quintuple helix innovation model (PINSKY et al., 2024). • Promote collaborative and coordinated governance between ministries and sectors (LOPES e CHIAVARI, 2022; STCP, 2023). • Establish monitoring, evaluation, and traceability systems (LOPES and CHIAVARI, 2022; STCP, 2023).

Source: Own elaboration.

The systematized recommendations reveal a strong convergence among the analyzed studies regarding the priorities for strengthening the bioeconomy in Legal Amazon. Among the most recurrent axes with the greatest potential impact on strengthening the sector, the following stand out:

- **The structuring of specific financial mechanisms for sociobiodiversity products and family farming,** with emphasis on adapted credit lines, thematic bonds, CBIOs, and access to working capital. These instruments are considered essential to expand the reach of public and private investments, with emphasis on the creation of private mechanisms that contribute to reducing the dependence of the sociobioeconomy on public resources.

- **Land regularization and legal security of traditional territories,** considered a necessary condition for the advancement of sustainable projects, the appreciation of local knowledge, and the attraction of long-term investments.
- **The development of logistical and productive infrastructure,** mentioned in practically all analyzed studies. It ranges from transport, storage, and energy to internet access, processing facilities, and basic equipment. The absence of these structural conditions increases transaction costs, reduces competitiveness, and inhibits the expansion of bioeconomy chains.
- **The strengthening of technical assistance and local capacity building,** especially through the expansion of Technical Assistance and Rural Extension (ATER) services and training focused on management, commercialization, quality control, and productive diversification. The lack of technical support is a persistent bottleneck for the quality and scale of initiatives.
- **The adoption of contextual and participatory public policies,** which recognize the distinct socio-environmental realities of the region ("different Amazons") and incorporate local knowledge in the formulation and implementation of bioeconomy strategies.
- **The promotion of inclusive and sustainable productive chains,** through collaborative governance, strengthening of meso-institutions, certifications, traceability, and insertion in differentiated markets, especially for sociobiodiversity products.
- **The integration between the bioeconomy, climate, and conservation agendas,** with incentives for nature-based solutions, payments for ecosystem services (PSA), and alignment with the international commitments assumed by Brazil.

These recommendations indicate that strengthening the Amazonian bioeconomy requires not only innovation but also the consolidation of bases already recognized as effective.

2.4. Conclusions of the Literature Review

The literature review on bioeconomy in the Legal Amazon shows that the project's success in the territory is directly linked to the articulation of adequate financial instruments, inclusive governance arrangements, valorization of traditional knowledge, access to minimum infrastructure, and public policies sensitive to local realities. These elements, when combined, create a favorable environment for attracting investments, structuring sustainable productive chains, and generating positive impacts both environmentally and economically and socially.

On the other hand, the failure factors mapped in the analyzed studies reflect, to a large extent, the absence or fragility of these same pillars. The scarcity of financing aimed at sociobiodiversity, the informality of productive chains, the precariousness of infrastructure, land tenure insecurity, the discontinuity of public policies, and the lack of technical assistance constitute the main bottlenecks that compromise the viability, scalability, and attractiveness of bioeconomy initiatives. These obstacles reduce the competitiveness of products, deter investors, and perpetuate structural inequalities in the territory.

The literature also indicates that most of these barriers can be overcome through the consolidation and expansion of factors already recognized as promoters of success. At the same time, it points to the need to address deeper structural challenges – such as violence in areas of land conflict, land grabbing, the fragility of local institutions, and the lack of administrative continuity. **The main challenge is to guarantee scale, continuity, and articulation between public policies, financial instruments, and strategies for valuing sociobiodiversity. This requires coordination between different actors – public, private, and community-based – and the strengthening of an institutional environment that allows transforming punctual initiatives into structuring solutions for the sustainable development of the region.**

3.

BIOECONOMY FINANCING MECHANISMS IN LEGAL AMAZON

Aiming to provide an updated overview of financing for the development of businesses and initiatives focused on the bioeconomy in Legal Amazon, this study conducted a non-exhaustive mapping of 159 funding sources for the bioeconomy operating in the region, encompassing public financing mechanisms (such as credit lines and non-reimbursable resources), private financing mechanisms (via credit and equities), and philanthropic mechanisms. The list of mapped mechanisms can be seen in Annex 1.

The methodology used for mapping financial mechanisms was based on exploratory research through the collection of secondary data and survey analysis on mechanisms and institutions that promote bioeconomy financing, including:

1. Research on online search platforms and/or with the aid of artificial intelligence, using the keywords: bioeconomy; Amazon; financing.

2. Direct research on the virtual platforms of Brazilian development finance institutions that are members of the Brazilian Development Association (Associação Brasileira de Desenvolvimento - ABDE), multilateral banks, international organizations, NGOs, and philanthropic institutions.

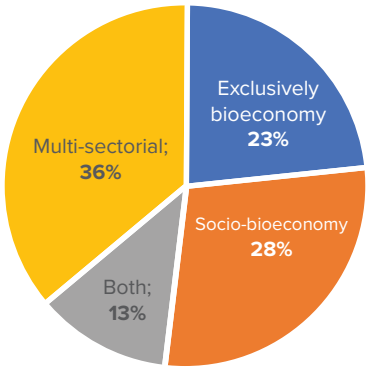
3. Data obtained via circulation of a virtual form within the Bioeconomy Working Group coordinated by Uma Concertação pela Amazônia (which brings together diverse actors interested in promoting the Amazonian bioeconomy), so that its members could contribute to the mapping of bioeconomy financing mechanisms.

4. Direct research on the virtual platforms of Brazilian asset managers based on a list of members of the Brazilian Private Equity and Venture Capital Association (Associação Brasileira de Private Equity e Venture Capital - ABVCAP).

5. Research on corporate venture capital initiatives in Brazil on online search platforms and/or with the aid of artificial intelligence, using the keywords: large Brazilian companies; bioeconomy; Amazon; corporate venture capital.

It is important to highlight that the analyses presented in this chapter focus on the quantity of mapped financing mechanisms, and not on the volume of resources effectively disbursed by each of them. **That is, the data systematized here indicates the diversity and distribution of the instruments available to support bioeconomy initiatives in Legal Amazon, without considering the financial magnitude of their operation.** Thus, the identification of a reduced number of mechanisms in a certain category does not necessarily imply a lower volume of financing associated with that category, when compared to another with more mapped instruments. This caveat is fundamental for the adequate interpretation of the analyses developed throughout the chapter.

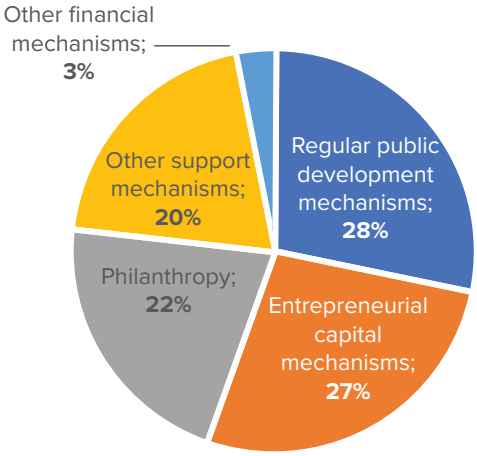
Figure 1: Distribution of the total mapped mechanisms



Source: Own elaboration

Regarding the destination of resources, among the mapped mechanisms, 23% are defined as exclusive for bioeconomy businesses and initiatives, while 77% have a broader application, involving other segments, activities, and business sizes. Using the concept of sociobioeconomy as a reference, 28% of the researched mechanisms can be classified as intended to benefit local communities, according to the product descriptions. However, only 13% of these mechanisms that serve local communities are also exclusive for bioeconomy activities. In general, about 65% of the mechanisms are intended for businesses of varying size/stage, with the others intended mainly for startups, micro, and small enterprises.

Figure 2: Distribution of financial mechanisms available for bioeconomy in Legal Amazon by type of mechanism/origin of capital



Source: Own elaboration

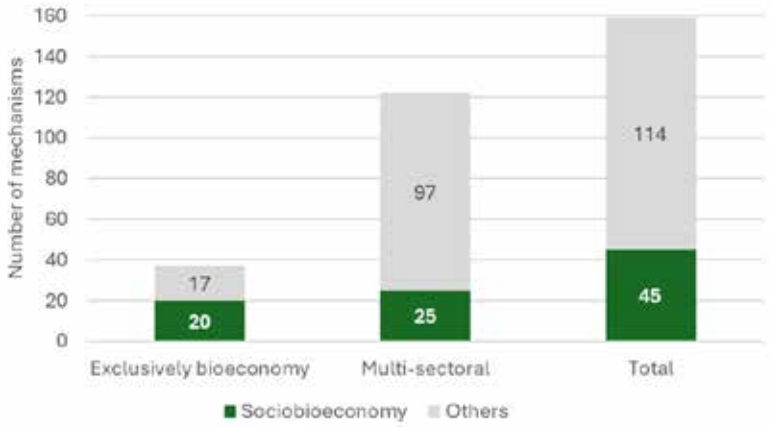
The mechanisms were also classified into categories according to type/origin of capital, with regular public development mechanisms (which constitute the main credit and financial support instruments made available by the Sistema Nacional de Fomento - SNF) and entrepreneurial capital mechanisms (characterized by instruments of private private equity[5] and venture capital[6], corporate venture capital[7] and other financial support for impact businesses and startups) being predominant, representing 28% and 27% of the mapped mechanisms, respectively.

Philanthropic support and investment concentrate 52% of the mechanisms made available via non-reimbursable resources. Other support mechanisms include insurance, resources for innovation, and international resources, concentrating 35% of non-reimbursable resources.

Other financial mechanisms refer to existing types of instruments in the capital markets that can allocate resources to bioeconomy activities, such as Green Agribusiness Receivables Certificates (Certificado de Recebíveis do Agronegócio Verde - CRA Verde), Investment Fund in Agroindustrial Production Chains (Fundo de Investimento nas Cadeias Produtivas Agroindustriais - Fiagro), Amazon Bonds (Títulos Amazônia), Green Rural Product Notes (Cédula de Produto Rural Verde - CPR Verde), and Exchange-Traded Funds (ETFs). In this category, individual emissions of each of these types of instruments were not tracked, but the modalities that have already been or will be used in emissions in the bioeconomy segment.

[5] Investments in more consolidated companies, focusing on expansion or restructuring, through equity participation
[6] Investments in emerging companies with high scalability potential, assuming higher risks also in exchange for equity participation.
[7] Investments made by large companies in startups or innovative businesses, aiming for open innovation and strategic synergies.

Chart 1
Available financial mechanisms for bioeconomy in the Legal Amazon (Mar/25-May/25)



Source: Own elaboration.

Of the total mechanisms identified in the research, 23% are exclusive for bioeconomy activities (37 mechanisms). Among these, 49% are associated with development (with 35% being regular public development mechanisms) and 24% are for entrepreneurial capital mechanisms. As other financial mechanisms do not account for individual emissions, they were not classified as specific to bioeconomy or not.

Table 1
Financial mechanisms exclusive for bioeconomy (Mar/25-May/25)

Type/origin of capital	Quantity	Distribution
Regular public development mechanisms	11	32%
Entrepreneurial capital mechanisms	9	26%
Other development mechanisms	9	26%
Development and philanthropic investment	5	15%
Total	34	100%

Source: Own elaboration.

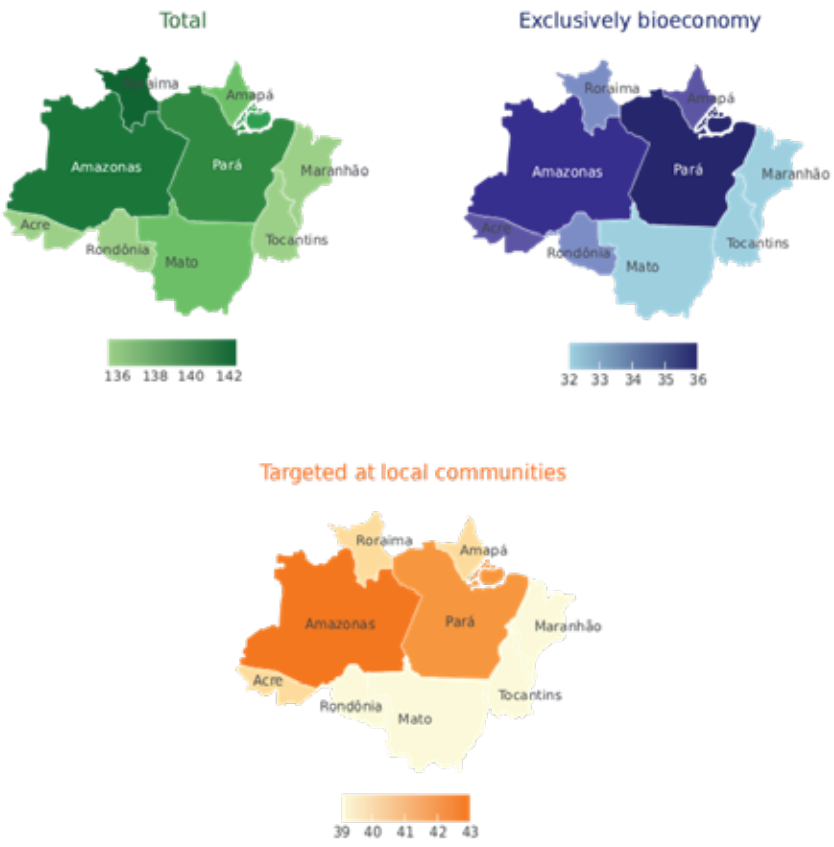
* * * *

3.1. Territorial Reach of Financing Mechanisms

Financing territorialization is a strategic component for strengthening the bioeconomy in the Amazon. Evaluating the declared geographical focus of the mechanisms allows for an understanding of whether the available instruments are truly directed towards the dynamics and needs of Amazonian territories – or if they operate in a diffuse and generic manner.

In this sense, the financial mechanisms available in each state of the Legal Amazon vary little in quantity compared to each other, between 134 and 141 mechanisms. This indicates that the mechanisms generally have coverage for the entire Legal Amazon region. The states of Amazonas and Pará stand out in the availability of mechanisms exclusive for bioeconomy and mechanisms directed to local communities.

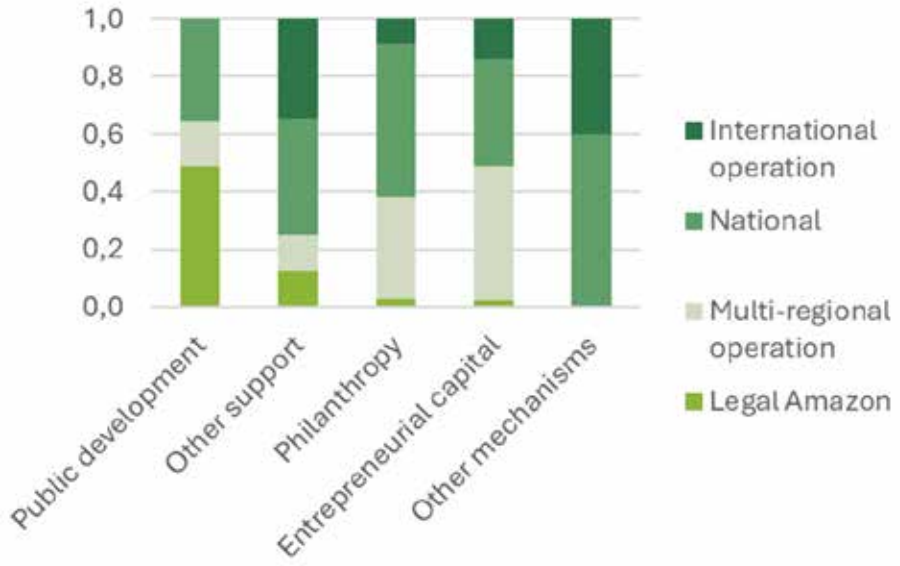
Figure 3: Available financial mechanisms for bioeconomy by state of the Legal Amazon (Mar/25-May/25)



Source: Own elaboration..

Chart 2 summarizes the distribution of mechanisms by mechanism type, according to the informed territorial scope.

Chart 2
Financial mechanisms territorial focus by type of mechanism (Mar/25-May/25)



Source: Own elaboration..

The analysis reveals distinct patterns of territorial operation among the different types of mapped financing mechanisms. One of the main highlights is the low incidence of instruments whose geographical focus is exclusively the Legal Amazon. Only the regular public development mechanisms (49%) and, to a lesser extent, the other support mechanisms (13%) show a significant presence directed at the region. Mechanisms such as philanthropic support and investment, entrepreneurial capital, and other financial mechanisms do not have a significant exclusive focus on the Legal Amazon.

Most mechanisms operate on a national scale, emphasizing other financial mechanisms (60%), philanthropic support and investment mechanisms (53%), and other support mechanisms (41%). This indicates that, although these initiatives are formally available for the Legal Amazon, they compete with projects from other regions of the country, which can limit access for Amazonian enterprises, especially those of smaller size or located in remote areas, which face greater difficulties in structuring and visibility.

Another important point is the high presence of mechanisms with multi-regional operation among the entrepreneurial capital mechanisms (47%). International operation appears in a more limited way, being more relevant in other financial mechanisms (40%) and other support mechanisms (34%).

In summary, the analysis of the territorial distribution of the mapped mechanisms indicates a concentration of public efforts on direct financing of the Amazonian bioeconomy, while private and philanthropic instruments operate mostly on broader scales. This pattern reflects the importance of public support as the main territorial anchor and reveals an opportunity to expand instruments concentrated on regional specificities.

* * * *

3.2. Resources Origin by Type of Mechanism

The data presented on the origin of resources by type of mechanism (Table 2) reveal an ecosystem characterized by strong institutional heterogeneity and growing protagonism of hybrid models.

Table 2
Main origins of resources by type of mechanism (Mar/25-May/25)

Type of mechanism	Main origin of resources (% highlight)
Development and support and investment	Private (65%), Hybrid (24%), Public/International (12%)
Entrepreneurial capital mechanisms	Private (51%), Hybrid (49%)
Regular public development mechanisms	Public (98%), Hybrid (2%)
Other development mechanisms	Multilateral (28%), Private (19%), Public/International (16%), Public/Private (13%), International (9%), Public (9%), Hybrid (6%)
Other financial mechanisms	Private (100%)

Source: Own elaboration..

The development and philanthropic investment mechanisms are predominantly financed by private resources (65%), originating from foundations, institutes, and corporate donations. However, a significant percentage of hybrid resources (24%) is observed, suggesting collaborative arrangements between sectors, in addition to some participation from international public sources (12%).

In entrepreneurial capital mechanisms, the origin of resources is balanced between private (51%) and hybrid (49%), reflecting the logic of impact investment that combines financial return with socio-environmental intentionality. This hybrid structure is characteristic of funds that combine philanthropic resources with equity or flexible debt instruments.

The regular public development mechanisms have an almost exclusively public origin (98%), which reflects their link with public policies, subsidized credit lines, and development programs operated by state banks and development agencies. The presence of hybrid sources (2%) is marginal, indicating low integration with other sectors in these instruments.

The other support mechanisms category is the most heterogeneous in terms of resource origin, combining multilateral (28%), with emphasis on organizations such as the Global Environment Facility (GEF), Green Climate Fund (GCF), Inter-American Development Bank (IDB), and the European Union (EU); private (19%) and hybrid (6%). Among the resource combinations, partnerships with the private sector, public/international (16%) and public/private (13%), signal co-financing arrangements. Smaller but relevant participations of exclusively public (9%) and non-public international (9%) resources are also observed. This diversity reflects the complexity of the governance arrangements of these mechanisms.

The other financial mechanisms – which include instruments such as Green CRA (Agribusiness Receivables Certificate), Fiagro (which is an investment fund for agro-industrial production chains), and Green CPR (Rural Product Certificate) – are 100% financed by private resources, indicating their direct link to financial and capital markets. Such instruments combine the logic of traditional investment with alignment to socio-environmental objectives.

In summary, the data indicates a segmentation in the origin of resources according to the type of mechanism. While public support is mostly state based (98%), philanthropic and entrepreneurial capital mechanisms show strong private (65% and 51%, respectively) and hybrid (24% and 49%, respectively) participation, reflecting dynamics of intersectoral collaboration. The category of other support mechanisms stands out for the plurality of sources (multilateral, private, and hybrid), signaling complex governance arrangements. Other financial instruments are exclusively private (100%). Among the mechanisms with operation (or potential operation) in the Legal Amazon that were tracked, approximately 49% are of public origin – which suggests a significant State presence in the available financing ecosystem.

This configuration represents an opportunity to leverage complementary resource origins and structure more integrated financing models adapted to Amazonian realities, but it also imposes coordination challenges, access, and effectiveness, especially for community enterprises. Consolidating financing structures that strategically combine public, private, multilateral, and philanthropic sources is advisable to strengthen the bioeconomy in the region.

4.

INSTITUTIONAL ACTORS OF BIOECONOMY FINANCING IN THE LEGAL AMAZON

This chapter aims to map, categorize, and analyze the different institutional actors that operate, or structure financing mechanisms aimed at bioeconomy in the Legal Amazon. Based on the identification of 111 institutions responsible for the 159 financial mechanisms mentioned in the previous section, we built a typology that organizes these actors into seven large groups, based on their institutional nature and role within the financing ecosystem.

Throughout the chapter, the analysis focuses on the distribution of the total quantity of actors and mechanisms by type of institution and the degree of thematic specialization (exclusivity in bioeconomy and focus on sociobioeconomy). More than quantitatively mapping the universe of involved institutions, we sought to reveal the certain types of financing they mobilize (or fail to mobilize) for Amazonian enterprises.

* * * *

4.1. Typology of Institutional Actors of Bioeconomy Financing in the Legal Amazon

This study identified 159 financial mechanisms aimed at financing the bioeconomy in the Legal Amazon, associated with 111 institutions with diverse institutional profiles. To systematize this heterogeneity and qualify the analysis, a typology that groups the different actors into seven categories, presented in Box 7, was elaborated.

This categorization allows for a more precise analysis of the roles played by each group in the bioeconomy financing ecosystem in the Amazon – whether as direct credit operators, providers of patient capital, territorial articulators, strategic investors, or implementers of public policies and technical cooperation programs.

It is worth highlighting that, despite the effort to map representative institutions of bioeconomy financing in the Legal Amazon, the survey presented here is not exhaustive.

Other relevant institutions may not have been captured, especially those with localized or indirect operations. Therefore, the data should be interpreted as a qualified sample, which offers relevant subsidies for analysis and reflection, but does not intend to cover the entirety of the existing universe of actors. Furthermore, as already indicated, the analysis considers the quantity of mapped institutions, and not the volume of resources effectively disbursed by each of them. That is, the presented data reflects the institutional diversity and the different types of instruments mobilized to support bioeconomy initiatives in the Legal Amazon, without contemplating the financial scale of each actor's operation.

Box 7

Typology of bioeconomy financing institutions in the Legal Amazon

Type of institution	Description
Public Banks and Development Agencies	Public financial institutions with mandates for regional, national, or sectoral development, which operate credit lines, reimbursable investments, and hybrid instruments.
Commercial Banks and Credit Cooperatives	Private financial institutions that operate own resources and, eventually, public development lines. Include both commercial banks, with broad credit granting capacity, and credit cooperatives, organized under an associative model and aimed mainly at financing micro, small, and medium enterprises.
Investment and Risk Capital Firms (VC/CVC/PE and Impact)	Venture capital (VC), corporate venture capital (CVC), private equity (PE), and impact funds that invest in scalable, innovative, or relevant businesses for bioeconomy, seeking financial return and/or positive impact. Include both independent funds and vehicles linked to large corporations that invest strategically in startups and bioeconomy projects.
Government Institutions and Multilateral Organizations	National public bodies, government agencies, international cooperation institutions, and multilateral organizations that act in the formulation of public policies, technical cooperation, intergovernmental articulation, and direct and indirect financing for the bioeconomy.
Philanthropic Organizations (International)	Foundations and international organizations that mobilize global resources to support socio-environmental impact projects on the Amazon, acting mainly via donations, dedicated funds, or technical support.
Philanthropic Organizations (National)	Brazilian institutions, networks, and foundations that promote the strengthening of the Amazonian bioeconomy through financial, technical, and institutional support.

Type of institution	Description
Hybrid Partnership	Institutional arrangements that bring together actors of different natures – such as public institutions, private entities, civil society organizations, and multilateral actors – for the joint development of mechanisms, programs, or funds aimed at bioeconomy financing.

Source: Own elaboration.

This typology will be used as base for the following analyses, allowing not only the comparison of number and types of mechanisms mobilized by each group, but also the comparison of their operating strategies, thematic priorities, and institutional challenges. It is worth noting that four mapped mechanisms do not have a clearly identified institution and, for this reason, were not classified.

* * * *

4.2. Distribution of Actors by Type of Institution

Table 3 presents a distribution of the 111 mapped institutions according to the typology proposed in the previous subsection. This classification allows for observing the institutional composition of the bioeconomy financing ecosystem in the Legal Amazon, considering the scope of institutions identified in the present study.

Table 3
Distribution of institutions by type of institution (Mar/25-May/25)

Type of institution	No. of institutions	Distribution
Philanthropic Organizations (National)	32	29%
Investment and Risk Capital Firms (VC/CVC/ PE and Impact)	25	22%
Philanthropic Organizations (International)	18	16%
Government Institutions and Multilateral Organizations	15	15%
Public Banks and Development Agencies	12	11%
Hybrid Partnership	5	4%
Commercial Banks and Credit Cooperatives	4	4%
No associated institution	1	1%

Source: Own elaboration.

Combined, national and international philanthropic organizations represent 45% of the total identified institutions, reflecting the relevant role of this segment in supporting socio-environmental agendas and promoting initiatives linked to the bioeconomy in the region. National philanthropic organizations are the most numerous among the sample (29%).

Investment and risk capital firms (22%) also occupy a significant position in the sample, indicating relevant participation of impact funds, private equity, and corporate venture capital in the ecosystem, especially aimed at innovative solutions and scalable businesses.

Government institutions and multilateral organizations (13%) complement the presence of the public sector in the ecosystem**, acting predominantly in the formulation of public policies, structuring of cooperation programs, and technical support.

Public banks and development agencies (11%) are less numerous in the set of mapped institutions but stand out for the volume and capillarity of the resources they operate. Their operation is strongly linked to structuring instruments, such as subsidized credit lines and public policies for productive development.

The presence of hybrid partnerships (4%), although still reduced, signals innovative institutional models, based on shared governance and the combination of resources and expertise from different sectors.

The participation of commercial banks and credit cooperatives (4%) remains limited in quantitative terms, which suggests opportunities to expand the engagement of these actors, whether through their own investments or via partnerships with other segments of the ecosystem.

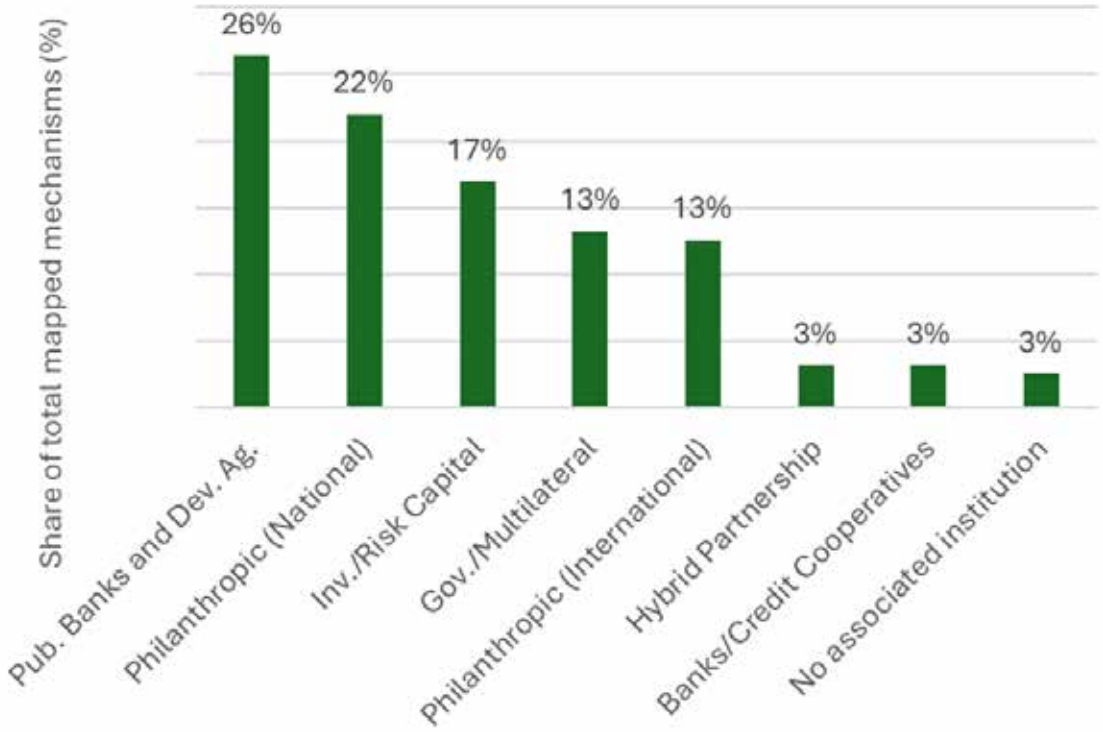
Four of the identified mechanisms do not have an institution linked to them and, therefore, were classified as having no associated institution, corresponding to 1% of the total.

* * * *

4.3. Bioeconomy Financing Mechanisms by Type of Institution

Beyond the observed institutional diversity, it is relevant to analyze how this diversity materializes in terms of effectively operated mechanisms. Chart 3 presents the distribution of the 159 mechanisms mapped in this study by type of responsible institution, allowing an assessment of the operational presence of each institutional group.

Chart 3
Distribution of bioeconomy financing mechanisms by type of institution (Mar/25-May/25)



Source: Own elaboration.

Public banks and development agencies, although representing only 11% of the actors (Table 3), possess the largest concentration (26%) of mapped mechanisms (Chart 3), which reinforces their structuring role as operators of public policies and providers of credit aimed at promoting the bioeconomy. This disparity reflects their capillarity in credit offering, which is especially relevant in Amazonian regions with low presence of private credit institutions, as demonstrated in the previous section, where public development institutions represent half of the credit made available in the Legal Amazon. **Almost the totality of the instruments mobilized by this group (98%) corresponds to regular public development mechanisms**, such as subsidized credit lines ranging from microcredit directed at traditional communities – indigenous, quilombola, riverside, extractivist, and family farmers – to medium and large-sized financing for forest management, sustainable agro-industries, and ecological restoration. This data highlights the centrality of these institutions in supporting productive bioeconomy enterprises, especially for community-based and territorial initiatives. However, only 26% of these mechanisms are exclusive for bioeconomy.

National philanthropic organizations occupy the second position in the mapping, accounting for 22% of identified mechanisms. Their operation stands out for the diversity of instruments used: 51% of the mechanisms refer to philanthropic support and investment – non-reimbursable resources – while 29% correspond to entrepreneurial capital mechanisms, such as equity instruments for impact businesses and startups. Additionally, 17% of the mechanisms are classified as other support mechanisms, including insurance and resources destined for innovation. These initiatives prioritize strengthening local development and productive inclusion, positioning the bioeconomy as a vector for promoting socio-environmental justice. The capillarity of these organizations – with operation in Indigenous territories, traditional communities, and family agriculture – and the integration between financing and capacity building are also noteworthy. **The combination of direct and structured instruments suggests the adoption of a hybrid strategy, possibly oriented towards long-term sustainability.**

Investment and risk capital firms are responsible for 17% of the mapped mechanisms and the totality of entrepreneurial capital mechanisms (100%), which include private equity, venture capital, and corporate venture capital. This composition reflects the growing interest of private capital in sustainable businesses and innovative solutions in the Legal Amazon. These firms' operations usually concentrate on high value-added sectors – such as biotechnology, carbon, and agroforestry chains – through hybrid structures that combine risk capital with socio-environmental impact, and, in some cases, partnerships with philanthropic funds. In general, they operate with requirements on financial performance and socio-environmental metrics, prioritizing scalable, replicable business models oriented towards return.

Government institutions and multilateral organizations operate, directly, 13% of the mapped mechanisms, with emphasis on the use of other support mechanisms (100%), ranging from direct subsidies and economic subventions to more complex arrangements of blended finances, payments for ecosystem services (PSA), thematic funds, and technical and institutional capacity building programs. **This operation combines the role of policy articulators with the effective capacity to contribute resources, contributing to the institutional structuring of the bioeconomy in the region.** Furthermore, it is worth noting that many international financial and multilaterals institutions operate indirectly on the theme through operations with national development banks and agencies – in this study, only direct operations between these institutions and the credit-taking agents were mapped.

International philanthropic organizations are responsible for 13% of the mapped mechanisms, with an operation characterized mostly by philanthropic support and investment (70%) and, to a lesser extent, by entrepreneurial capital mechanisms (30%). **This composition indicates an emphasis on mobilizing resources – generally non-reimbursable – for initiatives related to biodiversity conservation, confronting climate change, and strengthening forest-based bioeconomy in the Legal Amazon.** What is observed is a strategic approach that combines financing for local and community solutions with support for organizations that work on public policy formulation and the strengthening of climate

governance. **Among entrepreneurial capital, the use of patient capital directed at small and medium-sized enterprises with territorial operation stands out, often accompanied by incubation and acceleration programs, management support, and insertion in sustainable productive chains.**

Hybrid partnerships represent 3% of the mapped mechanisms and reflect innovative arrangements of shared governance and combined financing, involving institutions of different natures, such as the public sector, private sector, philanthropy, and civil society. Although still not very expressive in quantitative terms, these initiatives demonstrate potential for expansion, especially in contexts that require integrated and co-financed solutions. The analyzed mechanisms are based on philanthropic support and investment (40%), other support mechanisms (40%), and other financial mechanisms (20%), with a focus on traditional communities, micro and small enterprises (MPEs), and local socio-productive chains. Their strategic objectives include strengthening sustainable value chains, adaptation to climate change, social inclusion, and developing technical capacities in territories.

Commercial banks and credit cooperatives account for 3% of the mapped mechanisms and concentrate their operation on regular public development mechanisms (60%) and other support mechanisms (40%), including products such as rural insurance, green credit lines, and technical support, with a focus on family agriculture and small producers.

Finally, the mechanisms with no associated institution – which represent 3% of the total – are entirely classified as other financial mechanisms and include products such as Green CRA (Agribusiness Receivables Certificate), Fiagro (which is an investment fund for agro-industrial production chains), Amazon Bonds, and Green CPR (Rural Product Certificate).

Table 4
Proportion of exclusive bioeconomy mechanisms by type of institution (Mar/25-May/25)

Type of institution	Exclusive mechanisms	Non-exclusive mechanisms
Commercial Banks and Credit Cooperatives	60%	40%
Philanthropic Organizations (National)	29%	71%
Government Institutions and Multilateral Organizations	29%	71%
Public Banks and Development Agencies	26%	74%
Hybrid Partnership	20%	80%
Investment and Risk Capital Firms (VC/CVC/PE and Impact)	19%	81%
Philanthropic Organizations (International)	5%	95%
No associated institution	0%	100%

Source: Own elaboration.

Although all mapped mechanisms are bioeconomy compatible, only a fraction of them were designed exclusively for this purpose, as demonstrated in Table 4 above. **The analysis indicates that national philanthropic organizations and government or multilateral institutions present the highest percentages of mechanisms exclusively bioeconomy dedicated (29% of the mapped mechanisms),** signaling a significant commitment to solutions directly aimed at the Amazonian bioeconomy. **Next, public banks and development agencies stand out, with 26% of the mapped mechanisms aimed exclusively at the bioeconomy,** also evidencing a relevant degree of thematic prioritization.

International philanthropic organizations, in turn, have 95% of their instruments with a broader scope, which may indicate a lesser thematic focus on the specific challenges of local bioeconomy. Investment and risk capital firms also mostly operate non-exclusive mechanisms (81%), reflecting their broader focus on business models that associate return and positive socio-environmental impact. Despite operating few mechanisms, commercial banks and credit cooperatives show an elevated rate (60%) of exclusive mechanisms. Hybrid partnerships have 20% of exclusive mechanisms.

This data highlights that, although there are a variety of mechanisms compatible with bioeconomy initiatives, only a minority portion (around 20%) was conceived with this specific focus, which indicates a relevant opportunity for the development of dedicated instruments, more aligned with the particularities, challenges, and productive cycles of the bioeconomy in the Legal Amazon.

All identified mechanisms with no associated institution are exclusively destined for bioeconomy.

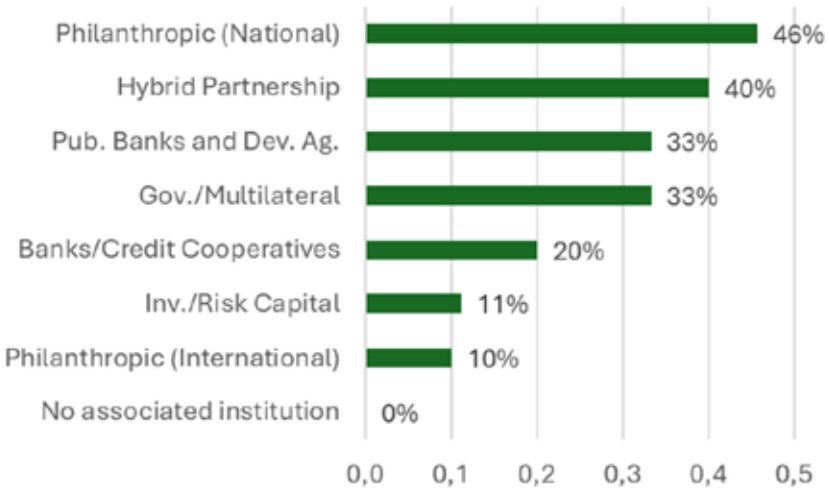
4.4. Financing of Sociobioeconomy by Type of Institution

Beyond institutional diversity and the thematic exclusivity of mapped mechanisms, it is fundamental to understand which institutions make resources available to the actors of the sociobioeconomy – understood here as the set of sustainable economic activities based on the valorization of Amazonian sociobiodiversity, developed in territories with a low degree of anthropization and occupied mostly by traditional populations and communities.

The tracking reveals that 28% of the mapped mechanisms explicitly declare being available for sociobioeconomy ventures, meaning they can be accessed by traditional communities, Indigenous peoples, family farmers, and other community-based actors. **This data indicates a significant concentration of instruments with a broader or generic scope, which do not necessarily contemplate the specificities of these segments. Even though the definition of the focus on sociobioeconomy may be subject to different interpretations, the data suggests that direct support for community-based and forest-based productive models is still limited in the financial bioeconomy ecosystem.**

Chart 4 presents the proportion of mapped mechanisms, by type of institution, which indicate a direct focus on sociobioeconomy, according to public descriptions or information gathered in interviews.

Chart 4
Share of sociobioeconomy financing by type of institution (Mar/25-May/25)



Source: Own elaboration..

National philanthropic organizations lead among the analyzed groups, with 46% of their mechanisms directed at the sociobioeconomy, which reflects their proximity to grassroots organizations and socio-environmental justice-oriented strategies. Next, hybrid partnerships (40%) stand out: although less representative in absolute numbers, they combine different funding sources and institutional capacities, signaling potential to expand support models adapted to local realities.

Government institutions and multilateral organizations (33%) also show relevant participation, which confirms their role in articulating public policies sensitive to the Amazonian context. Banks and public development agencies account for 33% of the mechanisms with a declared focus on sociobioeconomy, which indicates a, albeit partial, relevant commitment of these institutions with this segment. Due to their broad operational presence, there is room to expand the supply of financial products designed specifically to meet the dynamics and needs of the region's traditional territories.

Among private capital actors, commercial banks and credit cooperatives (20%), investment and risk capital firms (11%), and international philanthropic organizations (10%) show lower percentages. This may indicate lower adherence to strategies directly aimed at sociobioeconomy or a prioritization of themes such as innovation, carbon, or environmental conservation with less articulation with traditional ways of life. This scenario points to opportunities still little explored to bring these instruments closer to Amazonian socio-productive realities.

In synthesis, the analysis suggests that the bioeconomy financing ecosystem in the Amazon still lacks a clearer strategic direction to support productive models based on sociobiodiversity and traditional practices. Generic instruments often do not respond to the specific demands of the territories, which can limit the effective impact of the bioeconomy in the region. Strengthening this thematic focus can, therefore, be essential to consolidate sustainable, inclusive, and resilient productive chains in the Amazon.

* * * *

4.5. Conclusions

The analysis of institutional actors and bioeconomy financing mechanisms in the Legal Amazon reveals a diverse ecosystem but still marked by asymmetries and gaps in terms of thematic focus, instrument structuring, and alignment with the needs of Amazonian territories.

The typology developed in this study allowed the identification of seven distinct institutional profiles and the analysis of their respective operating strategies. Among the 111 mapped institutions, national philanthropic organizations (29%), investment managers and risk capital (22%), and international philanthropic organizations (16%) stand out quantitatively. Operationally, banks and public development agencies consolidate the largest number of mechanisms (26%), which reflects their structuring role in the ecosystem, especially as operators of public policies and subsidized credit.

The analysis shows that 23% of the mapped mechanisms were conceived exclusively to support bioeconomy initiatives. Furthermore, 28% of the instruments, although not exclusive, demonstrate some direction towards the sociobioeconomy, meaning they aim to benefit local communities and community-based initiatives. These percentages indicate that, although there is a significant number of instruments potentially compatible with the segment, few were designed to respond to the specificities of Amazonian territories and community-based productive dynamics.

Below, the main findings are summarized by institutional group:

- **National philanthropic organizations:** With the greatest presence among the mapped institutions (29%) and high rates of mechanisms exclusive to bioeconomy (29%) and available to sociobioeconomy actors (46%), they stand out for their operation oriented towards socio-environmental justice. They combine donations, technical support, and entrepreneurial capital, contributing to integrated solutions adapted to the territories.

- **Public banks and development agencies:** Despite representing only 11% of the institutions, they operate 26% of the mechanisms, with broad territorial coverage and a focus on subsidized credit. About 26% of their instruments are exclusive to bioeconomy and 33% can be accessed by sociobioeconomy, which suggests a relevant role, albeit still partial, in strengthening sustainable and inclusive productive models.

- **Investment and risk capital firms:** Comprising 22% of the mapped institutions, they operate exclusively with entrepreneurial capital mechanisms aimed at scalable and innovative businesses. Only 19% of their instruments are exclusive to bioeconomy and 11% are available for sociobioeconomy, which indicates that there is space for the development of instruments that are more aligned with the challenges of community and forest-based production.

- **International philanthropic organizations:** With 16% of the institutions and 13% of the mechanisms, they concentrate their operation on non-reimbursable resources and impact funds. Only 5% of their mechanisms are exclusive to bioeconomy and 10% are accessible to sociobioeconomy, which suggests a broader scope and lower thematic adherence to Amazonian specificities.

- **Government institutions and multilateral organizations:** Represent 13% of the institutions and operate 13% of the mapped mechanisms, standing out for their operation that combines direct support for local initiatives with efforts of institutional structuring and induction of public policies. With 29% of their mechanisms classified as bioeconomy-exclusive and 33% available for sociobioeconomy, it shows important alignment with the segment, although there is still room to deepen the connection with the productive dynamics of the territories and expand the effectiveness of support for community ventures.

- **Hybrid partnerships:** With reduced participation (4% of the institutions and 3% of the mechanisms), they present innovative formats that combine resources and capacities from multiple sectors. About 20% of their mechanisms are exclusive for bioeconomy and 40% have a focus on sociobioeconomy, signaling high potential for the expansion of integrated models adapted to the Amazonian context.

- **Commercial banks and credit cooperatives:** Still not very expressive in terms of the plurality of mechanisms in the ecosystem (4% of the institutions and 3% of the mapped mechanisms), 60% of their mechanisms are exclusive for bioeconomy, but only one reveals a declared focus on sociobioeconomy, revealing an unexplored potential for greater operation with local productive chains.

- **Mechanisms with no associated institution:** Correspond to 3% of the total mechanisms and are all classified as other financial mechanisms – such as Green CRA (Agribusiness Receivables Certificate), Fiagro (which is an investment fund for agro-industrial production chains), Amazon Bonds, and Green CPR (Rural Product Certificate). Although individual emissions were not mapped, it is important to reinforce the focus on sociobioeconomy and its better articulation with territorial strategies.

- **Low proportion of exclusive instruments:** Only 28% of the mapped mechanisms can be accessed by sociobioeconomy actors, reflecting a gap in support for community-based and forest-based productive models. The majority of mechanisms (77%) are not exclusive to bioeconomy, limiting their effectiveness for the particularities of the Amazon.

In general, the results point to the need for a clearer strategic direction, both from the public and private and philanthropic sectors, aiming to expand the supply of instruments dedicated to bioeconomy and, especially, to sociobioeconomy. This reorientation can be decisive for consolidating a sustainable, inclusive development model rooted in local knowledge and practices.

5.

CASE STUDIES ON BIOECONOMY FINANCING IN THE LEGAL AMAZON

This section presents case studies that evidence concrete experiences of bioeconomy financing in the Legal Amazon, highlighting both their advances and the challenges faced. The proposal is to deepen the understanding of how different types of financing – public, private, or philanthropic – have contributed to boosting economic activities based on the valorization of sociobiodiversity, while simultaneously identifying bottlenecks that limit the expansion and consolidation of the sector.

The case studies, presented in box format, were selected to reflect the diversity of arrangements and operational profiles in the Amazonian bioeconomy. They range from community ventures linked to sociobioeconomy to institutional support and promotion initiatives for the bioeconomy, including: Amazonbai, indigenous bioeconomy experiences, the rubber chain, startups, Sebrae, Banpará, Bank of Brazil, and Bank of Amazon.

The case studies were elaborated based on semi-structured interviews with representatives of the involved initiatives and institutions, complemented by documentary research in public sources, such as institutional pages, reports, news, and videos available on the internet. This methodology allowed for an in-depth capture of the factors that explain access to financing, their effects on the analyzed enterprises, and the challenges faced for the continuity and expansion of these initiatives.

For the first four studies (Amazonbai, indigenous funds, rubber chain, and startups), a common analytical structure was adopted, allowing for comparability between the examples. Each study explored the purpose and nature of the initiative, its insertion in the context of the Amazonian bioeconomy, the type of financing accessed and its importance for the viability of the activities, the impacts generated – including regarding sustainability and future perspectives of the operation –, in addition to the main challenges faced to access or expand financing. The unit of analysis, in these cases, is the enterprise or financed initiative itself, which allows highlighting the local implementation dynamics and results obtained from the received financial support.
In the studies conducted with institutions of the Sistema Nacional de Fomento (SNF - National Development System) (Sebrae, Banpará, Banco do Brasil, and Banco da Amazônia), an approach

focused on the institutional analysis of bioeconomy financing was adopted. The interviews followed adapted scripts to the reality and role of each institution, exploring themes such as the existence of specific financial products for bioeconomy, risk assessment criteria for operations, regulatory and operational bottlenecks, challenges faced by entrepreneurs, strategies for expanding credit, and the role of technical assistance. In addition to the pre-formulated questions, new questions were included during the conversations, as relevant topics emerged. This approach made it possible to capture institutional and operational nuances, offering a more comprehensive portrait of the challenges and opportunities for strengthening the bioeconomy from the National Development System (SNF).

* * * *

5.1. Amazonbai

Amazonbai and Sustainable Açaí Production in Bailique

Context and Origin

The experience of Amazonbai, the Agroextractivist Cooperative of Bailique Producers, located in the Bailique archipelago, in Amapá, illustrates the possibilities of integration between bioeconomy and environmental conservation. Founded in 2017, from discussions originating from the Bailique Community Protocol, Amazonbai aims to organize the açaí production chain in a sustainable way, promoting the well-being of local communities and protecting the region's biodiversity.

The Bailique Community Protocol, which guides the relations between local communities and external actors, played a crucial role in organizing the producers and establishing a collective vision in the region. Thanks to this initiative, Amazonbai developed and implemented sustainable açaí management practices that resulted in Forest Stewardship Council (FSC) certification, an international seal that recognizes respect for the forest and biodiversity in the management of natural resources. Currently, 95 producers and 32 communities participate in these practices, covering an area of 2,900 hectares managed with minimal environmental impact.

Situation and Challenges Faced

The first years of Amazonbai counted on the philanthropic financial support of foreign organizations, such as Porticus, which was fundamental for the initial structuring of the cooperative. This financing enabled the creation of structured processes, certifications, traceability, and activity monitoring, establishing a reference model for other initiatives in the Amazon. Subsequently, in 2021, Amazonbai accessed the Fundo JBS pela Ama-

zônia (JBS Fund for the Amazon), which invested in leadership training and the qualification of the cooperative's managers.

The low educational attainment among local producers and the lack of training to access international markets emerge as one of the main bottlenecks in the initiative's trajectory, which has also been seeking to overcome it through access to public policies that facilitate access to higher education for producer families.

In addition to the currently participating communities, Amazonbai has received demands from other riverside and Indigenous communities that wish to integrate the cooperative's model, attracted by the generated socio-economic and environmental benefits. However, expansion to include these communities presents logistical and financial challenges, which could jeopardize the application of the protocol in a more extensive territory. As a result, the cooperative's leadership has sought alternatives to sustainably scale its operations, maintaining the quality and principles that govern the Community Protocol.

Another recurring obstacle faced by Amazonbai is related to access to public financing. Despite attempts to access federal resources through participation in calls for proposals such as those from BNDES, bureaucratic difficulties and the slow pace in the execution of funds, such as the Fundo Amazônia (Amazon Fund), have been preventing significant advances.

Strategies and Adopted Solutions

The cooperative's leadership has sought alternatives to sustainably scale its operations, maintaining the principles of the Community Protocol. The recognition of Amazonbai is associated, largely, with its positive socio-environmental impacts. Unlike açaí monocultures, which can cause environmental degradation and ecological imbalances, the cooperative promotes management that respects the local ecosystem, preserving fauna and flora.

This approach is supported by its own methodology, developed in collaboration with the producers, and a commitment to maintaining the biodiversity of floodplain areas. In the words of Amiraldo Picanço, president of Amazonbai: "We always tell the producer that he is privileged, he doesn't need to plant açaí, he doesn't need to fertilize the land, he doesn't need to irrigate the açaí, because nature does everything for him." A consequence of this is the natural protection of the açaí produced by Amazonbai from pests commonly present in monoculture, resulting from ecosystem imbalance. As a result, Amazonbai's açaí is also free from the use of pesticides, which are increasingly restricted internationally by phytosanitary regulations, which represents a competitive advantage by differentiating the product in markets that value agroecological practices.
The cooperative also contributes significantly to the well-being of the communities. Its economic success promotes the empowerment of local communities in comparison with different spheres of government, which translates into greater access to public

policies. This is reflected in gains related to social infrastructure, such as solar energy and potable water systems, fundamental in a region affected by the progressive salinization of water resulting from climate chang. Furthermore, Amazonbai invests in young people education, through the Escola Família Agroextrativista (Agroextractivist Family School), which teaches both formal scholar curriculum and sustainable management and processing practices for açaí, adding value to the product and strengthening future generations of producers.

Amazonbai also invests in other priorities, such as strengthening monitoring and traceability of managed areas. This effort includes the use of technology to map the origin of products, ensuring that sustainable management is complied with in all stages. The implementation of these tools also contributes to transparency in operations and facilitates access to markets that value sustainability.

In the financial dimension, the cooperative has sought to scale its activities through the national and international commercialization of açaí. Furthermore, it is preparing to access financing aimed at environmental services, with a focus on conservation of standing forests and monitoring of protected areas, which may represent a new stage of its expansion and positive socio-environmental impact.

Results, Lessons Learned, and Next Steps

In addition to being essential for the incorporation of new territories and members, access to new funding sources is important to support the progressive increase in Amazonbai's productivity. In 2022, the cooperative was responsible for the production of 31 tons of açaí. In 2023, this volume reached 73 tons. Last year, production practically doubled again, reaching 137 tons. This represented a growth of 200% in its revenue, which reached R$ 2 million. This financial leap stems from the direct export of freeze-dried açaí (powder) to the United States and Europe, which represented 33% of the cooperative's revenue. With this commercial success, Amazonbai has been reducing its dependence on philanthropic investments to continue operating, with these representing only 12% of its revenues in 2024 (Exame, 2025). For 2025, the expectation is that the volume of produced açaí will reach 900 tons, which should result in the amplification of its independence from this type of funding source.

In addition to economic gain, Amazonbai has contributed to cultural valorization, youth inclusion, environmental conservation, and community empowerment. The demand from new riverside and Indigenous communities interested in adhering to the model reinforces the recognition of the initiative.

The trajectory of Amazonbai thus illustrates the potential of structuring sustainable productive chains and the vital role of bioeconomy financing for the prosperity of business models that integrate environmental conservation, social inclusion, and community development. With planned expansion and possible new financing, the cooperative appears well positioned to continue being a success example in the Amazonian socio-

bioeconomy.
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5.2. Indigenous Bioeconomy

Indigenous Funds in the Amazon: Financial Autonomy and Bioeconomy Protagonism
Context and Origin

In recent years, indigenous bioeconomy has been stimulated by the action of funds created and administered by Indigenous communities of the Brazilian Amazon. Examples are the Fundo Podáali, the Fundo Indígena do Rio Negro (FIRN - Rio Negro Indigenous Fund), and the Fundo Rutî, which raise and direct financial resources to bioeconomy projects designed and executed by Indigenous people. Although the creation of their own financial mechanisms was a historical banner of the Brazilian Indigenous Movement, the creation of the funds gained impulse with the Política Nacional de Gestão Territorial e Ambiental de Terras Indígenas (PNGATI - National Policy for the Environmental and Territorial Management of Indigenous Lands), instituted via decree by the Brazilian government in 2012. Within the scope of PNGATI, the Ministério dos Povos Indígenas (MPI - Ministry of Indigenous Peoples) has been collaborating with Indigenous communities to develop Planos de Gestão Territorial e Ambiental (PGTA - Territorial and Environmental Management Plans), which are the main instrument for implementing PNGATI (MPI, 2023). The funds seek to operationalize the guidelines established by the PGTAs.

The pioneering and most comprehensive case is that of Podáali – Fundo Indígena da Amazônia Brasileira (Indigenous Fund of the Brazilian Amazon), a private, non-profit association, headquartered in the city of Manaus, in Amazonas. Podáali operates in the 9 states that comprise the Brazilian Amazon and has the purpose of promoting and strengthening indigenous autonomy, rights, and territorial and environmental management. The fund contributes resources to support the priorities of the Axes of Action of the Coordenação das Organizações Indígenas da Amazônia Brasileira

(Coiab - Coordination of Indigenous Organizations of the Brazilian Amazon), of PNGATI, and of the SDGs for Indigenous peoples. This occurs through the launch of calls for proposals, which contemplate the following thematic lines: indigenous territorial and environmental management and protection; sustainable economy and food sovereignty; institutional strengthening and promotion of rights; professional training; guaranteeing rights of isolated indigenous peoples; ancestral medicine and indigenous health; cultural strengthening and traditional knowledge; gender, generations, and indigenous people with disabilities.

Situation and Challenges Faced

The viability and operation of the indigenous funds come from international donations and philanthropic financing mechanisms. Although essential for these initiatives to continue existing, these sources reflect a structural bottleneck in the financial architecture of these sociobioeconomy experiences, as they reveal the difficulty Indigenous peoples face in accessing other financing modalities, such as national public funds or private investments. Dependence on philanthropy is not a choice, but a condition imposed by technical, legal, and bureaucratic barriers that restrict direct access to resources.

The absence of formal administrative structures in the territories, such as Cadastro Nacional de Pessoas Jurídicas (CNPJ - National Registry of Legal Entities) and institutional bank accounts, coupled with the complexity of the calls for proposals and the rigidity of the accountability models required by traditional funders, limits the financial autonomy of indigenous organizations. Thus, the predominance of philanthropy in financing indigenous bioeconomy can be a symptom of the exclusion of a significant part of sociobiodiversity from the formal circuits of credit and investment.

Strategies and Adopted Solutions

Podáali, in its first call, supported more than 22 projects with a minimum value of R$20,000.00 (twenty thousand reais) and a maximum of R$50,000.00 (fifty thousand reais) per proposal. In the 2nd call, more than 40 projects were supported, with a minimum value of R$20,000.00 (twenty thousand reais) and a maximum of R$50,000.00 (fifty thousand reais), totaling an amount of R$2,000,000.00 (two million reais) in direct support for indigenous projects. This stage's initiatives were supported by the Climate and Land Use Alliance (CLUA) and the Instituto Ibirapitanga. The FIRN is a project of the Federação das Organizações Indígenas do Rio Negro (FOIRN - Federation of Indigenous Organizations of the Rio Negro) and was created to support projects of the communities and indigenous associations in FOIRN's coverage area and thus promote the well-being of the communities and the territorial and environmental management of the indigenous peoples of the Rio Negro. The fund aims to strengthen the Indigenous associations in FOIRN's network and the knowledge and practices of the Rio Negro peoples, guaranteeing resources so that

the communities, through the associations, can implement local actions foreseen in the PGTAs of the Indigenous territories of the upper and middle Rio Negro.

To access FIRN, Indigenous associations and communities need to write projects and submit them to the periodically launched calls for proposals. The fund finances different categories of projects, whose maximum budgets can vary from R$ 50,000.00 to R$ 200,000.00. The projects must adhere to one of three thematic axes that guide the fund's operation: culture, sustainable indigenous economy, and food security. The financial resources come from donations from Norway.

Finally, the Rutî Fund, which begins operations in 2025, is an initiative of the Conselho Indígena de Roraima (CIR - Indigenous Council of Roraima), an organization that has been acting for over 50 years in the struggle for guaranteeing the rights of the Indigenous peoples of Brazilian state of Roraima. The fund was born from the need to strengthen the sustainable development of the communities, guaranteeing the occupation and protection of the territories through the financing of projects, respecting the reality and way of life of the Indigenous peoples. Among its missions, it seeks to ensure the protection of biodiversity and strengthen climate resilience in the territories impacted by its initiatives, which can come to cover 15.7 million hectares of the Brazilian Amazon. Its governance is 100% Indigenous, ensuring that each decision and priority reflects the true needs and realities of the communities and peoples to be benefited. In its first call, the fund has R$ 2,750,000.00 to support up to 25 selected projects through a call for proposals. These financial resources were raised from international donors, such as the United States Agency for International Development (USAID) and Norway.

In this context, the funds function as a protection mechanism the Indigenous communities against the conditionalities often imposed by bioeconomy funders. By assuming an intermediary position between the territories and the donors, Podáali, for example, adapts the technical criteria and accountability formats to local realities, respecting community timeframes, and traditional ways of life. This allows the resources to arrive in a more agile and adequate way to the benefited projects, without the organizations having to submit to requirements incompatible with their contexts.

Lessons learned and Conclusions

These three funds share the fundamental characteristic of being managed by Indigenous organizations and aimed at strengthening the autonomy and governance of Indigenous peoples over their territories and ways of life. The individuals who compose their governance and administration have technical qualifications or higher education and bridge the gap between the fund's financiers and the benefited communities. On these bases, the funds seek to operationalize guidelines established by the PGTAs and by PNGATI, guaranteeing that the financial resources are applied according to the priorities defined by the communities themselves.

Beyond financially enabling bioeconomy projects, the proposal of these funds is precisely to build a financial logic based on Indigenous protagonism and their own forms of social control and accountability, which prioritize concrete results in the territories, instead of a bureaucracy disconnected from reality. Their action takes place in dialogue with other funds and community initiatives, establishing a logic of collaboration that is central to sociobioeconomy. Contrary to the market logic based on free competition, the indigenous funds operate in a network, strengthening each other through the exchange of experiences, political articulation, and the joint construction of fundraising and resource management strategies. This dynamic reflects an amplified conception of economy, which values interdependence, reciprocity, and care for the territories and people. In this sense, the indigenous funds not only financially enable bioeconomy projects but also materialize their own governance practices, capable of sustaining economic alternatives anchored in the cultural and ecological diversity of the Amazon.

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5.3. Rubber Production Chain

The Revitalization of the Amazon Rubber Chain

Context and Origin

The revitalization of the rubber chain in the Amazon shows how the sociobioeconomy can integrate into a global value chain. With the project “Juntos pelo extrativismo da borracha na Amazônia” (Together for extractive rubber in the Amazon), the region has experienced a leap in latex production, which reached 31.5 tons in the first shipment of the 2024/2025 harvest, generating R$ 441 thousand in income for families and associations of rubber tappers. The project, which has already benefited more than 4 thousand families in the Amazonian region, is promoted by WWF-Brazil in partnership with the Memorial Chico Mendes, Conselho Nacional das Populações Extrativistas (CNS - National Council of Extractive Populations), WWF-France, Michelin, the Michelin Foundation, and the Plataforma Parceiros pela Amazônia (PPA - Partners for the Amazon Platform). Furthermore, the Instituto Conexões Sustentáveis (Conexsus - Sustainable Connections Institute) also plays a fundamental role in the financial arrangement that has been boosting latex extraction by local rubber tappers.

The rubber chain was once one of the pillars of Brazilian economy in two previous

periods. Between 1870 and 1920, and in the context of the Second World War, the country assumed the position of the world's largest producer, experiencing two cycles of latex exploitation that promoted the growth of cities like Manaus and Belém. However, with the domestication of the rubber tree and the development of large cultivated areas in Southeast Asia, countries like Thailand, Indonesia, and Vietnam came to dominate the global market, leaving Brazil in a secondary position.

Situation and Challenges Faced

The current cycle has significant differences compared to the first two. Although extractive latex activity in the national territory no longer has the same economic weight as before, today it carries a strategic relevance due to its socio-environmental attributes in the context of global warming and climate emergency. Brazil produces about 259 thousand tons of rubber per year, mostly from planted rubber tree groves in the Southeast and South regions, a volume that meets only half of the internal demand and represents just over 1.5% of the world demand.

In this sense, the activity faces financial challenges, such as early access to capital for purchasing latex. Local associations, for example, do not have the resources to intermediate the sales with international buyers, which requires innovative financing solutions.

Strategies and Adopted Solutions

Latex extraction in the Amazon is differentiated by ensuring the preservation of diverse ecosystems. Unlike rubber tree plantations in monoculture, the native rubber groves of the Amazon host a diversity of animals and plants, such as Brazil nut trees and açaí palms, ensuring ecosystem balance. It is estimated that for each kilogram of native rubber produced, one hectare of forest is preserved, reinforcing the essential role of rubber tappers in biome maintenance. These professionals act not only as producers but as forest guardians, caring for areas that reach 300 hectares to guarantee the sustainability of their production. Furthermore, the current rubber cycle is characterized by bringing financial gains and thus improving the quality of life of local communities, significantly differentiating itself from previous cycles, when workers lived under a regime of strong exploitation.

This new cycle has been driven by the interest of companies aligned with the sustainable development agenda. Examples are Vert/Veja, a French shoe company that is today the largest buyer of Amazonian rubber, and Michelin, a buyer of the rubber promoted by "Juntos pela Amazônia". In an interview with Mercadizar (2024), Natasha Mendes, conservation analyst at WWF-Brazil, summarized the importance of these socio-environmental attributes: "The project aims to value sustainable extractivism through fair payment to rubber tappers, in addition to recognizing the essential ecosystem services for forest preservation".

In the financial and commercial arrangement that operationalizes the project, the extractive reserves have the purchase of rubber negotiated in advance and with the guarantee of a fair price, which accounts not only for the market price of latex but also for the bonus concerning the environmental services provided to the forest. Part of the income also contributes to the maintenance of structures and to the mobilization of participating associations. The associations play the role of intermediary between rubber tappers and Michelin. As they do not have the financial resources required in advance to make purchases, Conexsus offer loans, whose interest rates are philanthropically compensated for by the partnership between WWF and the Michelin Foundation.

In parallel, PPA channels financial resources for monitoring and technical advisory to the process, together with WWF-Brazil and the Michelin Foundation. The rubber from the project also receives the "Origens Brasil" (Brazil Origins) seal, awarded by the Instituto de Manejo e Certificação Florestal e Agrícola (Imaflora - Institute for Forest and Agricultural Management and Certification). This provides a guarantee of origin and process traceability, promoting the approximation between producers and buyers and thus meeting a growing demand from funders of sustainable enterprises. Finally, this process is also benefited by subsidies from municipal and state governments, which, functioning parallel to the project, help boost the sustainable exploitation of rubber and value the work of rubber tappers.

Lessons learned and Conclusions

The project "Juntos pela Amazônia" has already helped to conserve more than 145 thousand hectares in the Amazon, generating socio-environmental impact in six municipalities in Amazonas: Canutama, Eirunepé, Pauini, Manicoré, Barcelos/Novo Airão, and Itacoatiara. In its first year, 2022, the initiative allowed the production and sale of more than 65 tons of native rubber to Michelin, providing R$ 900 thousand in income to the participating families. Also in 2022, the conservation of over 60 thousand hectares in the Amazon was directly boosted by the sustainable management promoted by the project. In the following year, 2023, production doubled to 130 tons, generating R$ 1.8 million in income.

These results demonstrate that strengthening the rubber chain can represent an efficient strategy for sociobioeconomy, by articulating environmental conservation, income generation, and cultural valorization. The reinsertion of Amazon rubber into global markets, now with socio-environmental recognition, symbolizes a fairer, more sustainable cycle anchored in the protagonism of local peoples.

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5.4. Startups in Legal Amazon

Forest Startups: Innovation, Sustainability, and Financing in the Amazonian Bioeconomy

Context and Origin

In the Legal Amazon, startups have demonstrated how the integration between technology, sustainability, and social impact can boost the bioeconomy. Some examples are ManejeBem, E-UBÁ, and Zeno Nativo, which illustrate different approaches to facing the challenges of the region, benefiting from access to different financing mechanisms to make their operations viable.

ManejeBem, for example, combines digital technology and rural technical assistance to transform the agriculture of small producers. Through its platform, Impactools, the company connects farmers to experts in sustainable management, offering personalized diagnostics and guidance based on census data, satellite images, and local information. These practices promote greater efficiency in production, reducing environmental impact and increasing family income. In the region of Parauapebas and Marabá, 80% of farmers trained by ManejeBem adopted agroecological practices, resulting in an average increase of 40% in family income.

Situation and Challenges Faced

Despite the transformation potential, startups in Amazon face structural obstacles

such as limited access to infrastructure, logistical barriers, scarcity of patient capital, and low availability of technical services adapted to the local reality. Furthermore, the lack of knowledge on the part of investors about the risks and opportunities regarding the region can restrict access to strategic financing.

In the case of E-ubá, for example, one of the main overcome challenges was the development and testing of innovative and adequate transportation technology for the riverside context. Zeno Nativo also faced challenges related to the structuring of its productive chain with small communities and the expansion of its productive capacity to meet demanding international markets, while maintaining the commitment to sustainability and product traceability.

Strategies and Adopted Solutions

Access to financing mechanisms was essential for the development of ManejeBem. For the company to start operating in the Legal Amazon region, NESsT Amazônia played a key role in the process, providing financial support on two fronts. First, in the context of a project with the Cooperativa Mista dos Povos e Comunidades Tradicionais da Calha Norte (Coopaflora - Mixed Cooperative of Traditional Peoples and Communities of the Calha Norte Region), NESsT Amazônia donated to Coopaflora resources for hiring ManejeBem's services, in a philanthropic action for the region's bioeconomy. Furthermore, it granted the startup an interest-free loan of 500 thousand reais, with a 24-month term for payment and possibility of renegotiations. In return, ManejeBem committed to producing a detailed report on the socio-environmental impact of its services in the region. These resources were complemented by contributions from the Fundo Internacional de Desenvolvimento Agrícola (FIDA - International Fund for Agricultural Development - IFAD), partnerships with large companies, such as Ambev and Vale, and support from NGOs, such as the Instituto de Conservação e Desenvolvimento Sustentável da Amazônia (Idesam - Institute for Conservation and Sustainable Development of the Amazon) and Imaflora.

Another example is E-ubá, which proposes to revolutionize river transport in the Amazon with its electric boats. In a region with over 27 thousand kilometers of navigable rivers, where fuel-powered vessels are the norm, the startup proposes a solution that reduces carbon emissions, decreases operational costs, and improves the quality of life of riverside communities. In addition to being quieter and safer, E-ubá's electric boats promote greater ecological balance, reducing environmental impacts such as noise pollution, which interferes with fishing, and the risks associated with handling traditional propellers.

The trajectory of E-ubá was made viable by several strategic financings. The Fundo JBS pela Amazônia and the Habitat Elétrica program, from Norte Energia, financed the development of prototypes and field tests, while programs like Centelha and Sinapse Bio, in addition to institutions like the Financiadora de Estudos e Projetos (FINEP - Brazilian Innovation Agency) and the Fundação Certi, offered financial and technical

support for the advancement of its technology. In parallel, the company has invested in training local communities, ensuring that residents learn to operate and maintain the boats and the charging infrastructure. With plans to inaugurate a pilot plant for electric boat production financed by FINEP, E-ubá aims to expand its impact in the coming years, making the river bioeconomy more accessible and sustainable.

In turn, the startup Zeno Nativo exemplifies the sustainable use of Amazonian biodiversity, with a focus on the production of Brazil nuts and native cocoa. Located on the banks of the Acará River, in Pará, it uses sustainable agricultural practices that promote forest conservation and guarantee a fair remuneration for partner communities. With 250 families integrated into its productive chain, Zeno Nativo adopts modern methods, such as custom fermentation and slow solar drying for cocoa, ensuring the quality and traceability of the products, characteristics highly valued in the global market.

As in other experiences, access to bioeconomy financing mechanisms was fundamental for the expansion of its operations. For example, the Amaz Aceleradora de Impacto (Amazon Impact Accelerator) invested in the expansion of its factory, while Sinergia Investimentos provided evolutionary capital and strategic support. In addition to financial support, these institutions offered mentorships, immersions, and technical monitoring, creating a favorable ecosystem for the development of this Amazonian bioeconomy enterprise. Zeno Nativo's products, such as premium Brazil nuts and fine cocoa, are commercialized in the Business to Business (B2B) market, serving clients in Brazil and abroad, consolidating the company as a success example in the integration between environmental conservation and income generation.

Lessons learned and Conclusions

These experiences demonstrate how different forms of financing – from blended finance arrangements to interest-free loans and acceleration programs – have been essential for bioeconomy startups in the Legal Amazon. Each of them, with their specific approaches, contributes to solving complex challenges of the region, whether promoting sustainable agricultural practices, transforming river transport, or developing productive chains that preserve biodiversity.

In common, these startups reveal that their integration into strengthening the Amazonian bioeconomy requires a combination of innovation, strategic collaboration, and access to adequate financial resources. The result is a positive impact that transcends economic results, strengthening communities and promoting environmental conservation in a region fundamental for overcoming the climatic and environmental challenges of our time.

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5.5. SEBRAE

Inova Amazônia: Fostering Innovative Businesses in the Amazon

Context and Origin

The Inova Amazônia program, developed by Sebrae, is an initiative aimed at strengthening the bioeconomy in the Legal Amazon. Its main objective is to foster the emergence and development of innovative businesses that use biological inputs from the forest sustainably, promoting regenerative productive chains, income generation, and the valorization of local knowledge.

In general, the supported enterprises are distributed among three large audiences: entrepreneurs working with biological inputs (with applications in cosmetics, food, beverages, biotechnology, pharmaceuticals, clothing, ecotourism, and herbal medicines, among others), academic researchers (deep tech), and startups in the technology sector (dominant technologies).

Situation and Challenges Faced

Since its creation, the program has already held two editions. In the first edition, 229 companies were supported, with an investment of R$ 16 million in innovation stimulation grants. The second edition supported 260 companies in the ideation stage, with awards totaling R$ 540 thousand reais, and 180 formalized companies in the traction stage, with monthly grants of R$ 6,500 per partner, for up to six months.
Sebrae identified that the entrepreneurs supported by the program face significant financial literacy limitations. Among the main obstacles are the absence of well-structured business plans, little clarity about the intended use of the investments, and lack of knowledge regarding the requirements and the return profile expected by investors. A common example is the difficulty of these businesses, especially those

in the prototyping or product validation phase, to guarantee revenue recurrence, which generates pressure from investors. Added to this is the fact that the innovation financing ecosystem in Brazil is still characterized by high fragmentation and low institutional articulation, which hinders continuous and coordinated access to financial resources.

Another critical challenge is the lack of knowledge, on the part of entrepreneurs, of the regulations related to access to genetic resources, a central regulatory component for bioeconomy. The lack of familiarity with this legal framework compromises the legal viability of the businesses, restricts their capacity to scale safely, and hinders the attraction of more robust investments.

Furthermore, difficulties persist in the structuring of consistent and reliable socio-environmental impact metrics, despite the growing interest of investors whose theses are focused on bioeconomy and sustainability. Many businesses still do not have the necessary structure to monitor and report these indicators adequately, which can compromise their insertion into more demanding markets oriented by impact criteria.

Strategy and Adopted Solutions

The program has a support journey that combines awards and grants, training, mentoring, access to coworking spaces and laboratories, connections with investors, and networking events. The program also articulates with complementary mechanisms operated by Sebrae itself or by partners, such as Serviços em Inovação e Tecnologia (Sebraetec - Services in Innovation and Technology), which enables subsidized access to technological services, and the Empresa Brasileira de Pesquisa e Inovação Industrial (Embrapii - Brazilian Company for Industrial Research and Innovation), which enables access to financial resources with counterpart from the companies.

One of the differentials of Inova Amazônia is its territorial capillarity, enabled by partnerships with the Fundações de Amparo à Pesquisa (FAPs - Research Support Foundations) of nine states of the Legal Amazon. These partnerships allowed co-financing innovation grants, strengthening operation in hard-to-reach territories and contributing to the decentralization of bioeconomy promotion resources. In many cases, the initial support from Sebrae allowed the businesses to leverage additional resources, using one source as a counterpart to access another, an essential practice in a context of low integration between public and private financing instruments in the country.

Among the examples of supported businesses, initiatives such as Saboaria Rondônia stand out – the first micro-industry of cosmetics led by women in a rural environment in the state, which works with inputs from areas managed by indigenous and riverside people, promoting the regeneration of buriti palm and the productive inclusion of local communities. Another example is Ekilibre, a cosmetics company that acquires raw materials directly from riverside families, generating income and strengthening

sustainable value chains. Even though the program's focus is the innovative entrepreneur, approximately 70% of the supported businesses buy inputs from Indigenous, riverside, and quilombola populations, contributing to the dynamization of Amazonian sociobiodiversity economics.

The program also supports businesses with distinct technological profiles, from companies based on dominant technologies to academic originated deep techs, such as a startup that develops medicines from ibogaine – a substance of restricted use in Brazil. These businesses require more robust and patient investments, with long-term return and high risk, a profile still little understood and absorbed by national investors. Initiatives such as the Programa Prioritário de Bioeconomia (PPBio - Priority Bioeconomy Program) have been contributing to fill this gap, although access remains restricted and poorly articulated with promotion and acceleration programs.

Lessons learned and Conclusions

A recurring learning identified throughout the Inova Amazônia experience is the importance of the combination of different funding sources throughout the trajectory of the businesses. The success of the entrepreneurs often depends on their ability to articulate calls for proposals, grants, private contributions, and public promotion in a complementary way. However, this articulation requires a high degree of preparation, access to information, and insertion in support networks.

Sebrae has sought to fill this gap through platforms such as the Observatório Sebrae Startups (Sebrae Startups Observatory) and strategic partnerships with actors such as the FAPs, but recognizes that the lack of integration between credit and promotion instruments continues to be one of the main bottlenecks for the sustainability and growth of innovative businesses in the Amazonian bioeconomy.

In Sebrae's view, expanding the program's reach requires strengthening institutional partnerships, especially to share responsibilities along the business development journey, such as internationalization and access to new markets. The expansion of the entrepreneur base is also a priority, with actions aiming at an approximation with universities, technical schools, and remote regions, where there is often a lack of connectivity and technical support.

Inova Amazônia demonstrates that, although structural and regulatory challenges persist, it is possible to create a dynamic and decentralized ecosystem of support for bioeconomy in the Amazon, with a focus on innovation, territorial diversity, and training of local entrepreneurs.

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5.6. Banpará

BanparáBio: Financing for Small Bioeconomy Producers

Context and Origin

Banpará has stood out for pioneering initiatives in financing bioeconomy projects aimed at sociobiodiversity in the Amazon. With the objective of supporting small traditional rural producers in the region, the bank created the "Núcleo de Bioeconomia, Bolsa e Ativos Verdes" (Center for Bioeconomy, Exchange, and Green Assets), strengthening its operation in the development of productive chains based on biodiversity assets.

In this sense, the bank started working with the lines of the Pronaf Forest (Programa Nacional de Fortalecimento da Agricultura Familiar) and Pronaf Bioeconomia, aimed at sociobiodiversity. However, the main instrument created in this context was the BanparáBio microcredit line. The line finances up to R$ 30 thousand for agricultural activities in rural or community areas, prioritizing family farmers, Indigenous peoples, quilombolas, extractivists, and fishers. The resources can be used in extractivism, fishing, agriculture, livestock, tourism, handicrafts, apiculture, and investments, respecting the limit of up to 70% of the value declared in the Cadastro de Agricultor Familiar (CAF - Family Farmer Registry) or in the Declaração de Aptidão ao Pronaf (DAP - Declaration of Aptitude for Pronaf), with simplified guarantees, based on third-party or solidarity aval.

Situation and Challenges Faced

The bank recognizes significant logistical obstacles to entrepreneurs' access to credit. The requirement for in-person service at branches is an obstacle, especially in hard-to-reach territories. Although there is interest in the digitalization of processes, the available public and private systems are still limited.

Cases of denied credit occur mainly due to links with deforestation or the absence of minimum land tenure documents, such as the letter of consent in leased areas. Furthermore, disorganized productive chains – such as that of cassava, marked by a scarcity of quality seedlings, lack of transport infrastructure, and dependence on intermediaries – increase the perception of risk, especially in a context of absence of real guarantees.

In contexts of high socio-environmental risk, such as deforestation complaints made by the Public Ministry or absence of updated and timely satellite monitoring data, the bank has even suspended operations in entire municipalities.

Strategies and Adopted Solutions

Reformulated in 2024 to expand its reach to traditional audiences, the line benefited almost a thousand producers since May of the same year, with about R$ 20 million in granted credit. The terms vary according to the activity, can reach three years, with

grace periods of up to 12 months and annual, semi-annual, quarterly, bimonthly, or monthly amortization. The interest rate is fixed at 8% per year and can be adjusted according to resource availability.

The contracting process follows standardized stages that involve prospecting and initial guidance to the client, cadastral analysis, delivery of the checklist, choice of the project designer, elaboration of the Levantamento Socioeconômico (LSE - Socioeconomic Survey), analysis and approval of the proposal, contracting, and release of resources. The selection of projects goes through a careful evaluation, which includes negative certificates of illegal deforestation, embargoes, and pending issues with the Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA - Brazilian Institute of the Environment and Renewable Natural Resources), analysis of the Cadastro Ambiental Rural (CAR - Rural Environmental Registry), in addition to proof of labor regularity. The credit proposal must be accompanied by the LSE, photos with georeferenced coordinates, and, in the case of traditional communities, a notarized declaration proving the proponent's belonging. The nature of the activities and the coherence between the financeable items and the reality of the borrowers are also evaluated.

The project designers play a strategic role in the operationalization of the line. They must be previously qualified by Banpará and are responsible for the technical visit to the enterprise, elaboration of the LSE, viability analysis, and monitoring of the application of resources. The provision of technical assistance is linked to the duration of the financing contract. The designers must deliver an inspection report with georeferenced photos, and, in some cases, additional technical reports may be required by the bank. Professionals from the community itself have proven to be more effective in technical performance, promoting greater adherence to the local context and reducing default.

Although it does not require land titling for credits of up to R$ 50 thousand, Banpará requires proof of possession, such as linkage to collective CARs and proof of belonging to reserves or community groups. The institution adopts an extensive eligibility checklist, which includes negative certificates of illegal deforestation, embargoes, and pending issues with IBAMA, in addition to labor regularity.

To overcome bottlenecks, the bank has sought alternatives such as the development of new lines aimed at carbon credit (SAFs, restoration, and REDD+[8]), financing of green livestock farming, and electric vehicles. For this, it bets on articulation with partner institutions and strategies for intermediation of carbon credit.

Lessons learned and Conclusions

The Banpará experience shows that it is possible to adapt financial instruments and internal processes to deal with the particularities of Amazonian territories, combining technical criteria, robust analysis processes, and local partnerships, to expand access to credit. Its operation with traditionally excluded audiences represents a significant advance in strengthening the sociobioeconomy in the region.
However, the consolidation of a robust financing ecosystem requires complementary

[8] Redução das Emissões por Desmatamento e Degradação Florestal.

actions, such as strengthening productive chains, expanding the base of qualified technical staff, diversifying funding sources, and the articulation between credit, technical assistance, and public policies.

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5.7. Bank of Brazil – BB (Banco do Brasil)

Banco do Brasil and the Amazonian Bioeconomy: Institutional Adaptation and Innovation

Context and Origin

Banco do Brasil has sought to adapt its strategies and financial products to meet the specificities of the bioeconomy in the Legal Amazon. Although it does not have exclusive lines for the sector, the bank has worked on the adaptation of existing lines, especially those linked to the Plano Safra (Harvest Plan), to serve family farmers, extractivists, artisanal fishers, and small forest entrepreneurs. The adopted logic is to match the client's profile with the most adequate line, using, for example, Pronaf for new bioeconomy entrepreneurs.

Among the lines with potential to support the bioeconomy, Pronaf Bioeconomia stands out, with a portfolio balance of R$ 646 million in 2023, and Pronaf Agroflorestal

(Agroforestry), with R$ 105 million in the same year. In aggregate terms, Banco do Brasil already finances R$ 1.7 billion in bioeconomy projects in the Legal Amazon, positioning itself as one of the main financial agents of sociobiodiversity in the region.

Situation and Challenges Faced

Recognizing the limitations of the traditional banking service model in a territory marked by high population dispersion and limited infrastructure, the bank identified relevant structural challenges. Among the main bottlenecks are excessive bureaucratization, lack of land tenure documentation, low digital connectivity, and the absence of electrical energy in many communities.

Land regularization is seen as a cross-cutting challenge. In quilombola territories, for example, the land cannot be used as a real guarantee, requiring innovative arrangements. Furthermore, there is a mismatch between the profile of the enterprises and the conditions of the available credit lines. While rural credit works relatively well for family farmers, micro, small, and medium enterprises face obstacles such as terms and interest rates that are not compatible with the bioeconomy reality.

Regarding the impact measurement, the bank collects data on aggregate indices, such as avoided emissions and prevented deforestation, in addition to portfolio balance and people served in bioeconomy. However, there is greater difficulty in measurement when it comes to companies, for which it is more difficult to capture the socio-economic impact generated in the communities. The institution recognizes the challenge and points to the need to develop more specific impact indicators for bioeconomy.

Strategies and Adopted Solutions

In response to these challenges, the bank created in 2024 the “Hub Financeiro para Impulsionar a Sociobioeconomia” (Financial Hub to Boost sociobioeconomy), with headquarters in Belém (PA) and Manaus (AM). The hub adopts a “phygital” (physical and digital) service model and centralizes initiatives related to the bioeconomy. It acts by connecting clients to adequate financial products, enabling specialized technical assistance, promoting training, articulating with multilateral agents, providing support for resolving documentary obstacles, and acting as a focal point of the institutional strategy for the region.

Banco do Brasil’s hubs also work to adapt the bank’s lines to local realities, validating overlapping CARs and connecting operations to evolving public policies. Access to credit itself has been seen as an instrument to encourage regularization. Furthermore, the bank organizes service “mutirões” (financial services community fairs) in the territories, with specific attention to the participation of women, offering support for childcare during in-person activities.

Socio-environmental risk analysis is a vital component in client registration, with the use of tools such as the CAR and data from MapBiomas to assess deforestation historic.

When projects are linked to cooperatives, these are also evaluated as a whole. The action of local credit agents is fundamental to contextualizing risks and understanding territorial nuances that are not captured by conventional systems.

To expand financing to smaller-scale chains, such as those of non-timber forest products or managed fishing, the bank bets on the articulation of productive arrangements and on acting as a risk facilitator. In several cases, it connects large scale buyers of sustainable inputs (such as forest-based rubber) to cooperatives and small suppliers. Credit is then made viable not only by formal guarantee, but by the structuring of the chain and by the reduction of default risk based on supply contracts. Success cases have been used as reference to guide new enterprises, including in the extraction and processing chains.

In 2023, Banco do Brasil joined the Coalizão Verde (Green Coalition), signed letters of intent with the World Bank, IDB, and Bank of Montreal (BMO) Financial Group, raising over US$ 1 billion for projects of environmental recovery, bioeconomy, and sustainable exports, and established a protocol of intentions with the MMA during COP28, with a focus on investments in bioeconomy and climate resilience. In 2024, the bank promoted the event “Impulsionando a Sociobioeconomia da Amazônia” (Boosting Amazon’s sociobioeconomy), in partnership with Instituto Clima e Sociedade (iCS - Climate and Society Institute) and MMA, announcing a series of agreements and initiatives that aim to foster sustainable production and prepare small farmers, extractivists, and cooperatives for access to credit and to bioeconomy lines.

Lessons learned and Conclusions

With this series of initiatives, Banco do Brasil has sought to transform its role from a financing agent to an inducer of the ecological transition and productive inclusion. By investing in regional structures, adapting products, raising international resources, and qualifying technical assistance, the institution positions itself to respond to the challenges of the Amazonian bioeconomy.

The experience demonstrates that strengthening the Amazonian bioeconomy depends on the adaptation of financial institutions to local realities, on the construction of partnerships, and on the prioritization of sociobiodiversity as a strategic vector for sustainable development.

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5.8. Bank of Amazon – BASA (Banco da Amazônia)

BASA – Strategies and Challenges in Credit for the Bioeconomy

Context and Origin

Bank of Amazon (BASA) is one of the main financial institutions operating in Legal Amazon and has sought to adapt its operation to meet the specificities of bioeconomy in the region. In the bioeconomy sector, the bank offers mainly products linked to Plano Safra that dialogue with sociobiodiversity, with emphasis on Pronaf Floresta and Pronaf Bioeconomia. Both support activities such as SAFs, recovery of degraded areas, and sustainable use of natural resources, with the second also aimed at initiatives such as pasture recovery and crop-livestock-forest integration. With an interest rate of 3% per year, they are attractive options for family farming and traditional communities, even though Pronaf Bioeconomia imposes requirements for real guarantees that limit its reach among producers in irregular land tenure situations.

Situation and Challenges Faced

The low land regularization in the region, the main instrument for offering real guarantees in long-term financing, is pointed out by the bank as one of the main obstacles to credit, especially in the case of farmers without formal title. Among them are those who have only informal purchase and sale contracts, those settled by the Instituto Nacional de Colonização e Reforma Agrária (INCRA - National Institute for Colonization and Agrarian Reform) who are not on the List of Beneficiaries, and those who occupy areas classified as public forest type B not designated – all prevented from offering the property as a guarantee. In the case of Pronaf Floresta, the risk of the operation is fully covered by the Fundo Constitucional de Financiamento do Norte (FNO - Constitutional Financing Fund for the North), allowing greater flexibility. In Pronaf Bioeconomia, the risk is shared between the bank and the fund, with 50% of the operation covered by FNO and 50% by BASA, which leads the bank to require additional guarantees for operations above R$ 30 thousand. This requirement ends up restricting access to credit for family farmers, extractivists, riverside dwellers, and other community-based producers.

It is common practice to use the mortgage of properties as the main guarantee for long-term financing. However, identifying and exploring alternatives to secure these operations represents a necessary advance to provide the operation in the region. This need becomes even more evident considering that the constitutional funds were created precisely to serve the neediest regions of the country, recognizing that, in them, there is a continuous process of evolution, with maturing institutions and a population with characteristics proper to their environment. They are, in general,

remote areas, with precarious infrastructure, lack or absence of technical assistance – often poorly adapted to bioeconomy chains. In summary, if credit management guided by public policies is not capable of incorporating these specificities, such productive chains and their actors will remain on the margins of development.

Even so, land regularization remains one of the greatest obstacles to financing. Farmers who occupy areas of undesignated public forest (classified as type B), for example, are automatically prevented from accessing credit, even when they have consolidated production and interest in regularizing. The very Pronaf line aimed at land regularization – which could help these producers – cannot be accessed by those already in an irregular situation, creating a circular impasse: the credit that would allow regularization cannot be granted precisely because of the absence of this regularization. Furthermore, producers settled outside the INCRA List of Beneficiaries, a common situation in old settlements or with high occupant turnover, also cannot access Pronaf lines. Even purchase and sale contracts without notary registration, frequently used as informal proof of possession, are insufficient to meet the cadastral and documentary requirements.

Another significant bottleneck is related to the provision of technical assistance, whose presence is still limited in remote and hard-to-access areas, where many sociobiodiversity producers are concentrated. Although public technical assistance companies have numerous teams and territorial capillarity, the proportion of credit proposals originated by public technical assistance is still relatively low when compared to private technical assistance. This difference may stem from operational challenges faced by public assistance, such as budgetary limitations. On the other hand, private technical assistance tends to act more intensely in regions of easier access and lower operational cost. Strengthening the operational capacity and the alignment of public technical assistance with the bioeconomy chains may be an important step to increase the number of structured projects eligible for credit, especially in the regions where technical support is scarcer and more necessary.

The structuring of projects for chains such as Brazil nuts, cocoa, and managed fishing also faces relevant challenges. The absence of technical parameters and economic indicators makes it difficult to formulate financing proposals, especially in disorganized chains or with a large presence of intermediaries. Initiatives such as the SAF of dendê palm, supported by companies like Natura and by Embrapa research, show the potential of articulation between producers, cooperatives, buyers, and financiers, but are still exceptions in a scenario marked by institutional disarticulation.

Strategies and Adopted Solutions

Faced with these challenges, BASA has developed innovative risk mitigation models, structuring guarantee arrangements based on integrated productive chains. One of the adopted formats involves the celebration of tripartite agreements between the bank, the purchasing industry, and the producers, in which the industry actively

participates in prospecting farmers who will take credit with the bank, provides technical assistance, and signs a supply contract with the financed producers. As part of the agreement, the industry deposits an amount in a linked account – usually between 3% and 10% of the total financed volume – which functions as a liquidity guarantee fund to cover eventual defaults. Payment to the producer is made by the industry through an account at the bank itself, which allows the financial institution to automatically retain the amount of the due installment.

In addition to models with industries, BASA has been studying similar mechanisms with cooperatives and community associations, in which the sales contract signed between the organization and the institutional buyer (such as food or cosmetics industries) functions as a kind of "commercial collateral". In this model, the cooperative acts as an indirect guarantor: it receives the product from the farmers, makes the sale, and passes the amounts directly to the bank, which deducts the financed amount and passes the rest to the producer. These solutions have allowed expanding access to credit by farmers who, otherwise, would be excluded by the traditional guarantee requirements.

Additionally, BASA has a Sistema de Gestão Socioambiental (SGA - Socio-Environmental Management System) and has been undergoing a process of improvement in the monitoring of socio-environmental indicators, with technical support from the Agence Française de Développement (AFD - French Development Agency) under the Programa de Apoio ao Financiamento de Investimentos Sustentáveis para Implementação da Iniciativa Franco-Brasileira sobre a Bioeconomia (AMABIO - Support Program for Financing Sustainable Investments for the Implementation of the Franco-Brazilian Bioeconomy Initiative). The bank receives support from the program in three initiatives: i) improvements in the Socio-Environmental Risk Management System, ii) structuring of green financial products, such as Green Livestock, Payment for Environmental Services, and Green CPR, and iii) development of an initiative to support innovative bioeconomy projects. Furthermore, it participates in an initiative of the ABDE network, in partnership with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ - German Society for International Cooperation), aimed at structuring a financial product for bioeconomy chains, which incorporates the implementation of socio-environmental impact indicators, such as avoided carbon, area regeneration, and improvement of income of traditional populations.

Lessons learned and Conclusions

For BASA, strengthening bioeconomy in Legal Amazon requires an integrated approach. This involves from the diversification of guarantee instruments – with the development of guarantee funds and models of productive integration – to the strengthening of public technical assistance, which has capillarity and potential to expand its operation in the sociobiodiversity chains. Articulation with institutions such as INCRA and environmental agencies is also fundamental, with a view to overcoming land and regulatory obstacles that still prevent access to credit by a significant portion

of family farmers and traditional communities.
In the bank's assessment, credit is only one of the links in a broader chain, which depends on land regularization, technical training, and productive organization. While these structuring elements are not fully addressed, the development of the bioeconomy will remain conditioned by challenges that go beyond the action of a single financial institution.
References:

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5.9. Analysis of Presented Cases

The first three cases presented share a series of characteristics that allow them to be framed as sociobioeconomy experiences, which, as examined in Chapter 1, represents the variant of Amazonian bioeconomies with greatest potential to offer solutions to the current climate and environmental crisis. In common, they are based on the prevalence of the objective of environmental preservation and traditional knowledge over market imperatives aimed at short-term profit maximization. This is reflected in models of productive organization and financial arrangements in tune with ecosystem balance, which justifies the attraction of resources aimed not only at payment for the offered products but also for the provided environmental services, which contribute to the conservation of the Amazon rainforest and, as a consequence, to the achievement of climate and environmental goals reflected in the Paris Agreement and the SDGs. Even so, there are relevant limitations to the financing of these experiences, which potentially illustrate the challenges imposed on the expansion of the sociobioeconomy in the region.

One example is the predominance of financial support from philanthropy and international donations as enablers for each initiative. For example, for the revitalization of the Amazon rubber chain to occur, philanthropy played a fundamental role in the financial arrangement that connects the three parties involved in the business – rubber tappers, associations, and buyers. In the Amazonbai case, philanthropic investment was essential for the cooperative to structure itself and start operating, in addition to playing a relevant role in training the members. The indigenous funds operate thanks to support from philanthropic and international donations. In fact, in the case of rubber and the indigenous funds, resources of this nature were not only enablers, but each initiative established a relationship of structural dependence on them to continue existing. This represents an important bottleneck for their survival, as far as it is an inherently volatile financing model and subject to abrupt ruptures in its functioning.

Furthermore, dependence on philanthropy and international donations is a symptom of the absence of significant state support for the region's sociobioeconomy. In the rubber chain case, we saw that the only form of public sector support is indirect, based on tax incentives from municipal and state governments for latex production. In the Amazonbai case, although public policies aimed at education and producer training have been fundamental to dealing with one of the main challenges to accessing financing calls for proposals, namely the educational precariousness of the members, access to public financing support calls for proposals remains an unattained goal. Nor do aforementioned indigenous funds have financial resources originating from the State. Despite these indirect actions, there is still the challenge of expanding public mechanisms that channel financial resources for the expansion of the sociobioeconomy.

Chiavari et al. (2024) show that, in Brazil, private sources are responsible for 69% of financing for the bioeconomy – understood here in its broad sense. When considering rural credit, which is a consolidated public financing instrument, financing for biodiversity products amounts to only 2% of the amount channeled to soybeans between 2021 and 2023. Furthermore, despite its importance for achieving climate and environmental goals, the North Region, where most of the Brazilian Amazon is concentrated, obtained only 12% of financing for biodiversity products between 2021 and 2023, ranking only ahead of the Center-West (11%) when considering the five regions of the country. The Amazonian sociobioeconomy still lacks targeted support, where public resource sources play a fundamental role in leveraging initiatives that need financing conditions more compatible with the nature of the business and local conditions.

The launch of the Estratégia Nacional de Bioeconomia (ENB - National Bioeconomy Strategy) by the Brazilian government, in June 2024, represents an important step in promoting a new development model. The ENB aims to articulate and execute public policies aimed at the bioeconomy, understood as a form of production based on justice, inclusion, and ethics. This approach seeks to combine scientific and traditional knowledge to generate sustainable products, services, and technologies, promoting biodiversity conservation, income and employment generation, and contribution to climate balance (BRASIL, 2024). There is, therefore, a strong alignment of this conception of bioeconomy with sociobioeconomy. This is also evidenced by the objectives and guidelines listed in the ENB, which contemplate actions such as payment for environmental services and ecological transformation, valorization of biodiversity, respect for the rights of Indigenous peoples and traditional communities, among others. This is the foundation for economic and financial instruments to foster the national bioeconomy to be launched by the government in the medium term.

A perennial integrated action to develop the sociobioeconomy also involves overcoming challenges in a broader economic context, such as increasing debt in Global South, which pressures public budgets and restricts climate mitigation and adaptation actions (Volz et al., 2021), and reductions in international support for sociobioeconomy projects by USAID (Cassela; Felizardo, 2025), for example, which played an important role for the functioning of indigenous funds and conservation projects in the Amazon.

If on one hand, in the portrayed experiences where there are especially administrative challenges and more informality in the initiatives, there is greater dependence on philanthropic initiatives and international donations, which can be affected by the cited political-economic factors; on the other hand, the experience of startups that integrate into the Amazonian bioeconomy shows a more varied offer of financing mechanisms, especially from the action of impact financial vehicles and other private institutions. This can be explained by the greater ease with which these companies can meet the bureaucratic demands present in the requirements and conditionalities for accessing bioeconomy financing sources. For example, the very structuring of a legal entity enables the contracting of loans or equity participation. Furthermore, it is a financing relationship that meets the parameters of the dominant de-risking paradigm in the current global financial order (Gabor; Braun, 2025).

In the institutional studies (Sebrae, Banpará, Banco do Brasil, and Banco da Amazônia), the four analyzed institutions demonstrate distinct but complementary strategies to make bioeconomy financing viable in Legal Amazon. In common, they share the recognition of the structural obstacles that limit the expansion of sustainable productive models based on sociobiodiversity – especially land tenure informality, the fragility of technical assistance, and the absence of organized productive chains. At the same time, each of them acts in critical dimensions of financing – whether through promotion of innovation (Sebrae), through access to inclusive rural microcredit (Banpará), through the scale of systemic financing with institutional articulation (Banco do Brasil), or through the operational adaptation of public credit instruments to the Amazonian reality (BASA).

The case of Sebrae, through the Inova Amazônia program, stands out as a structuring platform for fostering innovative businesses in the Amazonian bioeconomy. The articulation with FAPs, the use of innovation grants, and the combination of training, mentoring, and connection with investors give capillarity and adaptability to the program. However, it reveals structural bottlenecks that persist and affect the businesses' sustainability: low capacity to absorb risk capital, difficulties with regulatory norms (such as access to genetic resources), and financial literacy challenges on the part of the entrepreneurs. The fragmentation of the innovation financing ecosystem in Brazil intensifies these limitations, requiring greater articulation between public and private sources. Furthermore, the requirement for robust socio-environmental impact metrics represents a new.

Banpará, in turn, focuses on audiences traditionally marginalized by the financial system – Indigenous peoples, quilombolas, artisanal fishers, extractivists, and family farmers. With the creation of the BanparáBio line, the bank enables access to rural microcredit with simplified guarantees and rigorous socio-environmental criteria. The work of local project designers, the use of deforestation indicators, and the requirement for minimum land tenure regularity demonstrate a concern for the socio-environmental integrity of the credit portfolio. However, structural challenges such as the informality of production chains, land tenure obstacles, environmental risks (such as links to deforestation), and the requirement for in-person service limit the reach and scale of the credit policy. Despite these limitations, the bank has

been seeking innovations in new lines, such as carbon credit and green livestock farming, signaling a scope expansion.

The case of Banco do Brasil reveals an institutional effort to adapt to the specificities of the Amazonian bioeconomy by adapting existing products (such as the Pronaf lines) and creating regional support structures, such as Sociobioeconomy Finance Hubs. With over R$ 1.7 billion already financed in bioeconomy projects in Legal Amazon, the bank plays a central role as a large-scale financial agent. Its activities include engagements with buyers, cooperatives, multilateral organizations, and public agencies. Nonetheless, limitations persist related to land documentation, the rigidity of conventional credit lines, and the absence of specific indicators for measuring the socioeconomic impact of bioeconomy projects. The attempt to compensate for these gaps with service task forces, product adaptation, and connection with public policies demonstrates a trend of the bank transitioning from a funding agent to a systemic inducer of the bioeconomy.

BASA stands out for its effort to adapt existing public lines – especially Pronaf Bioeconomia and Pronaf Floresta – to the reality of Amazonian producers, while structuring innovative solutions to mitigate risks and expand access to credit. Among these solutions are models of productive integration with industries or cooperatives, in which supply contracts and guarantee funds function as viable alternatives to traditional collateral. Still, the bank faces major limitations stemming from land and environmental irregularity, which even prevents producers from accessing land regularization lines. The absence of technical parameters for chains such as SAFs (Agroforestry Systems) and cocoa, the low presence of public technical assistance in remote areas, and the lack of robust impact metrics also emerge as central bottlenecks. In response, the bank has been working in articulation with partners like ABDE (Brazilian Association for Development), AFD (French Development Agency), Embrapa, and GIZ (German Agency for International Cooperation), seeking to structure new products with socio-environmental Key Performance Indicators (KPIs) and operational integration solutions.

Despite differences in scope, approach, and target audience, the last four cases highlight a common limitation: the absence of a coordinated, robust financing ecosystem adapted to the specificities of the Amazonian bioeconomy. While Sebrae acts as an initial catalyst for innovation, Banpará enables inclusive microcredit, Banco do Brasil operates on a national scale with inter-institutional articulation, and BASA seeks to make public credit instruments more flexible, all these institutions face barriers that cannot be overcome in isolation. The advancement of the bioeconomy demands effective integration of public policies, the strengthening of technical assistance, land and environmental regulation more coherent with the reality of the territories, a representative budgetary allocation for the contribution of sociobioeconomy to climate resilience and mitigation, and the protection of biodiversity and traditional knowledge in the Amazon.

* * * *

5.10. Main Conclusions

- **In the portrayed sociobioeconomy initiatives, the relevance of philanthropic financial resources was evident.** This reflects the difficulty in accessing public calls for proposals to foster the bioeconomy and obstacles to obtaining private financing. In two cases (indigenous bioeconomy and the rubber chain), there is a structural dependence on donations and philanthropic resources for the initiatives to remain viable.

- **Dependence on philanthropy is a problem recognized by representatives of the initiatives themselves in the interviews conducted, given that it is a less formal source of financing and more vulnerable to instability in its continuity.** It is, therefore, a potential bottleneck for the Amazonian sociobioeconomy, if future research confirms that this is a structural issue for sociobioeconomy experiences in the region.

- **The difficulty in accessing public and private resources appears associated with the low level of education among sociobioeconomy agents.** This makes it unfeasible to access public calls for proposals and to comply with requirements and conditionality often imposed by public and private financing mechanisms. This scenario demonstrates the need for actions aimed at the education and training of sociobioeconomy agents.

- **In two of the case studies (Amazonbai and indigenous funds), there is an expectation that access to public sources of bioeconomy financing will be facilitated in the near future.** This results from the perception of the intention to expand these financing mechanisms based on the National Bioeconomy Strategy, established in 2024.

- **There are relevant differences between sociobioeconomy experiences and startups regarding access to financing.** In the former case, financing sources are predominantly philanthropic. The latter, however, have access to more varied mechanisms, mainly from private sources.

- **Political-economic challenges can restrict the financing of the bioeconomy and, especially, the sociobioeconomy in the Legal Amazon.** From an economic perspective, the constrained fiscal space imposed on developing countries, like Brazil, prevents greater State action in financing the bioeconomy. From a political perspective, it is essential that the implementation of the National Bioeconomy Strategy occurs on a perennial basis, beyond the current government administration.

- **Initiatives with a territorial focus and greater adaptation to the Amazonian reality tend to present better conditions for enabling credit for the bioeconomy.** Experiences such as Inova Amazônia, BanparáBio, and the operational arrangements developed by BASA indicate that elements like the local presence of technical agents, the flexibilization of collateral, and the adjustment of financial products to the land tenure situation can contribute to expanding the reach of financing mechanisms.

- **The complementarity between different sources and financing instruments reveals itself as a recurring point of attention.** The combination of public grants, subsidized credit, private capital, and hybrid mechanisms can be a relevant strategy to sustain enterprises throughout their trajectory. In this sense, broadening the articulation between institutions and programs can help reduce the fragmentation observed today in the bioeconomy financing ecosystem.

- **The capacity of bioeconomy entrepreneurs to access financial instruments still faces significant limitations.** Aspects such as the absence of technical data on certain production chains, the complexity of regulatory requirements, the challenges associated with land and environmental regularization, and the difficulties in offering collateral compatible with the demands of financial institutions suggest the importance of strengthening policies to support productive organization, technical training, and financial literacy.

- **Monitoring the impacts generated by financed projects is a field with development potential.** Although some institutions collect quantitative data, such as disbursed amounts and number of operations, the measurement of socioeconomic and environmental effects remains limited. BASA's experience, in participating in the structuring of financial products with specific impact indicators, may inspire other similar initiatives.

- **The adaptation of financing models to the socio-territorial conditions of the Amazon can be a relevant strategic agenda for the advancement of the bioeconomy.** Recent experiences, such as the Banco do Brasil's Sociobioeconomy Hubs and the shared guarantee models articulated by BASA with cooperatives and industries, illustrate concrete possibilities for action focused on risk mitigation, strengthening technical assistance, and inserting producers into structured chains. The persistent rigidity of traditional financial structures, coupled with land informality and the socioeconomic vulnerability of a large portion of local entrepreneurs, suggests the need to explore more flexible, inclusive formats aligned with the socio-productive diversity of the region.

6.

RECOMMENDATIONS

This chapter aims to present a set of recommendations to expand the supply and access to financing mechanisms aimed at the bioeconomy in the Legal Amazon, with special attention to sociobioeconomy. The recommendations systematized here are the result of an integrated analysis of the previous chapters, which addressed the available financial mechanisms (chapter 3), the involved institutional actors (chapter 4), and case studies illustrating bioeconomy financing experiences in the region (chapter 5). Based on this empirical and analytical material, it was possible to identify recurring patterns, structural gaps, relevant innovations, and opportunities for improvement in public policies, financial instruments, and institutional practices.

The proposed set is organized into two main blocks. The first (6.1) brings together structural recommendations aimed at improving the financial ecosystem as a whole, focusing on governance, regulation, instruments, and inter-institutional articulation. The second (6.2) presents specific recommendations for strengthening sociobioeconomy, recognizing its productive, territorial, and cultural particularities.

In section 6.3, we compare the recommendations emerging from the analysis developed in this study (chapters 3, 4, and 5) with those systematized from the literature review presented in chapter 2. The objective is to highlight points of convergence, as well as to evidence original contributions of this work to the debate on financing the bioeconomy in the Legal Amazon.

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6.1. Structural Recommendations to Improve the Financial Ecosystem of the Bioeconomy in Legal Amazon

The integrated analysis of financing mechanisms (chapter 3), institutional actors involved (chapter 4), and concrete experiences of bioeconomy financing (chapter 5), reveals the existence of a heterogeneous financial ecosystem, still marked by fragmentation, asymmetries of access, regulatory gaps, and low inter-institutional coordination. There is a lack of systemic policies that articulate the diverse types of financing and consider the territorial, cultural, and productive specificities of the region.

This section presents seven structural recommendations aimed at overcoming these challenges, focusing on improving the financial ecosystem. The proposals include governance actions, creation and adaptation of instruments, technical and informational support policies, and intersectoral articulation strategies. Each recommendation is accompanied by:

I. a synthetic description of the identified problem;

II. the proposed solution;

III. the target institutional audience responsible for its implementation.

6.1.1. Establishing a National Bioeconomy Financing Strategy that Articulates Public, Private, Philanthropic, and Multilateral Sources

Identified Problem: Fragmentation of the bioeconomy financing ecosystem in the Legal Amazon, with low articulation between public, private, philanthropic, and multilateral instruments.

Recommendation: Despite the creation of the ENB (National Bioeconomy Strategy) in 2024, there is still no integrated financing framework that defines roles, goals, and instruments to mobilize resources on scale and with territorial capillarity. It is recommended to formulate and implement a national financing strategy, connected to the ENB, that articulates different types of capital (subsidized, philanthropic, hybrid, private) and involves instances such as ABDE, BNDES, regional banks, sectoral ministries, international funds, and civil society organizations. This strategy must define territorial and productive priorities, financing goals, and coordination mechanisms between the different types of funders. It must also guarantee the inclusion of sociobioeconomy as an explicit priority, with specific goals for its promotion.

Target Audience: Federal Government, National Financial System (SNF), philanthropy, multilateral agencies.

6.1.2. Expanding Dedicated Bioeconomy Financing Mechanisms with Specific Criteria Adapted to the Amazonian Reality

Identified Problem: Low proportion of mechanisms aimed exclusively at the bioeconomy (23% of the mapped mechanisms), with scope and criteria poorly adjusted to the productive and territorial specificities of the region.

Recommendation: Expand the supply of dedicated financial mechanisms, with clear scope, criteria adjusted to the production chains and territorial arrangements of the region. This includes specific credit lines, investment funds with a sectoral focus, public calls for

proposals structured for community enterprises, and innovation calls with rules adapted to sociobiodiversity.

Target Audience: Federal Government, public banks, innovation promotion agencies, impact investors, and philanthropy.

6.1.3. Developing Innovative Guarantee Models Adapted to the Bioeconomy and the Land Tenure Context of the Amazon

Identified Problem: The requirement for traditional collateral, combined with land informality, prevents Amazonian enterprises from accessing existing financial mechanisms, especially in sociobiodiversity chains.

Recommendation: Develop innovative collateral models, such as public guarantee funds with specific criteria for bioeconomy, shared guarantees with partner cooperatives or industries, and the use of supply contracts and future revenues as collateral.

Target Audience: Federal Government, public banks, regulatory agencies such as the Central Bank of Brazil (BCB), guarantee funds, and credit cooperatives.

6.1.4. Strengthening Technical Assistance as a Public Policy Complementary to Financing

Identified Problem: The limited coverage and specialization of available technical assistance hinder the structuring of fundable projects, the adequate allocation of resources, and the full utilization of credit instruments. This is a persistent bottleneck especially for community, family, and traditional peoples' initiatives, which could benefit from a more capillary and locally adapted service.

Recommendation: Strengthen the public policy of Technical Assistance and Rural Extension (ATER) aimed at the bioeconomy, with priority for the continuous training of technicians, articulation with universities and research centers, and direct integration with financing instruments. Technical assistance must be recognized as a structuring policy for access to credit, focusing on sociobiodiversity chains, training of local agents, and articulation with universities and research centers.

Target Audience: Federal Government, public ATER institutions, universities and federal institutes, cooperatives, and civil society organizations active in the bioeconomy.

6.1.5. Establishing Specific Socio-Environmental Impact Indicators and Metrics for Bioeconomy Projects

Identified Problem: The absence of robust socio-environmental impact metrics compromises the measurement of project results, hindering risk assessment, accountability, and the mobilization of resources from impact investors and climate capital.

Recommendation: Develop and adopt standardized socio-environmental impact indicators aligned with the specificities of the Amazonian bioeconomy, including sociobiodiversity products, community chains, and diverse territorial contexts. The development must consider indicators that can be adopted by public banks, investment funds, philanthropic organizations, and multilateral organisms. Their use should be gradual, with support for the technical qualification of entrepreneurs.

Target Audience: SNF, investment funds, philanthropic organizations, and multilateral organisms.

6.1.6. Creating an Integrated Public Platform of Information on Bioeconomy Financing

Identified Problem: The fragmentation and low accessibility of information on financial mechanisms make it difficult for potential beneficiaries to navigate and generate information barriers, especially for small entrepreneurs and traditional communities.

Recommendation: Develop a public information platform that brings together, in accessible language, the available mechanisms, access requirements, deadlines, and institutional contacts. The platform can be integrated into the SNF service systems and adapted to the reality of Amazonian territories.

Target Audience: Ministries responsible for bioeconomy and regional development, state, and municipal governments, SNF.

6.1.7. Stimulating the Creation of Hybrid Financial Mechanisms with Shared Governance

Identified Problem: The low integration between financing sources and the absence of multi-sectoral governance instances limit the effectiveness and scale of investments in bioeconomy. The analyzed experiences evidence the potential of hybrid arrangements to respond to complex bottlenecks in specific production chains and territories.

Recommendation: Stimulate and support the creation of hybrid financial mechanisms

– which combine public, private, philanthropic, and multilateral resources – focusing on systemic solutions for bioeconomy production chains and with shared governance instances. The solutions can include structured funds, co-financing platforms, or consortia with the participation of diverse actors.

Target Audience: Subnational governments, SNF, investment funds, philanthropic organizations, and multilateral organisms.

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6.2. Specific Recommendations to Strengthen Sociobioeconomy

As demonstrated in previous chapters, sociobioeconomy-based enterprises face particular barriers to accessing financing, which are not limited to the scarcity of instruments but also involve institutional, land tenure, technical, and cultural challenges. At the same time, **sociobioeconomy plays a strategic role in confronting the climate crisis by promoting low-carbon productive models, biodiversity conservation, and the valorization of traditional knowledge.** Although the structural recommendations of this study propose the expansion of mechanisms dedicated to bioeconomy and the development of innovative collateral models, it is essential to recognize that sociobioeconomy segments demand even more specific solutions. **Thus, a set of recommendations that recognize and act upon these specificities is necessary.**

This section presents six specific recommendations aimed at overcoming the challenges faced by sociobioeconomy.

6.2.1. Strengthening Instruments Dedicated to the Sociobioeconomy, with Conditions Adapted to the Amazonian Reality

Identified Problem: The low proportion of financial instruments with specific scope for sociobioeconomy limits the access of Indigenous peoples, traditional communities, and family farmers to financing, due to the inadequacy of eligibility criteria, documentary requirements, and collateral incompatible with their socio-productive realities.

Recommendation: Develop and expand financial instruments with an explicit focus on sociobioeconomy, incorporating eligibility criteria adapted to the diversity of community productive arrangements, the multifunctionality of activities, and the generated socio-

environmental benefits. These instruments must foresee greater flexibility in collateral, deadlines, and documentary requirements, considering the land tenure, environmental, and administrative specificities of Amazonian territories.

Target Audience: SNF, public funds, and philanthropic organizations.

6.2.2. Structuring Financing Mechanisms Based on Results and Ecosystem Services

Identified Problem: Despite the potential of results-based mechanisms – such as PES (Payment for Ecosystem Services), conservation contracts, and restoration funds – to remunerate sustainable practices, their implementation in the Amazon is still incipient and hardly accessible to communities and traditional peoples. There is a lack of criteria adapted to the region's socio-productive diversity and technical support for access and monitoring.

Recommendation: Structure and expand results-based financing mechanisms, which allow remuneration for practices that conserve the forest, regenerate ecosystems, and contribute to confronting climate change. This includes strengthening PES policies, designing conservation contracts linked to verifiable targets, and creating public and private funds for restoration and forest bioeconomy. These mechanisms must be accessible to different beneficiary profiles and accompanied by adequate technical and legal assistance, aiming to guarantee their effectiveness and inclusion.

Target Audience: Federal Government, Amazonian states, environmental funds, philanthropy, public banks, and multilateral organisms.

6.2.3. Expanding Support for Grassroots Organizations and Sociobioeconomy Cooperatives

Identified Problem: Many community organizations face difficulties in accessing financing and operating efficiently due to the fragility of their institutional structure, absence of formal regularization, low management capacity, and logistical difficulties. These obstacles compromise local leadership and the sustainability of sociobioeconomy initiatives.

Recommendation: Expand technical, financial, and regulatory support for cooperatives, associations, and community consortia in the Amazon. This support should include specific credit lines for institutional strengthening, training programs in management and commercialization, access to equipment and infrastructure, legal and fiscal regularization, and support for the certification of sociobiodiversity products. Such measures must recognize the strategic role of these organizations as articulators of local production chains.

Target Audience: Federal Government, SNF, civil society organizations, public banks, and philanthropic foundations.

6.2.4. Fostering Territorial Financing Arrangements with Qualified Local Presence

Identified Problem: The absence of institutional presence in the territories and the centralization of credit processes limit the reach and effectiveness of financing instruments, making it difficult to serve remote communities and consider their socio-productive specificities.

Recommendation: Foster territorial financing arrangements for the bioeconomy that guarantee qualified local presence and articulation between different actors. This includes the work of community credit agents, decentralized offices, bioeconomy hubs, support networks, and intermediary organizations. Such arrangements should combine diverse instruments (credit, grants, technical assistance) and be connected to sustainable territorial development strategies, promoting coordination between financial institutions, philanthropic organizations, local governments, and cooperatives.

Target Audience: Public banks, state and municipal governments, credit cooperatives, NGOs, and local bioeconomy support networks.

6.2.5. Developing Adequate Indicators for Evaluating Sociobioeconomy

Identified Problem: The absence of specific metrics to evaluate the impacts and value generated by sociobioeconomy enterprises limits their recognition by funders, compromises resource allocation, and renders relevant results such as environmental conservation, cultural valorization, and community institutional strengthening invisible.

Recommendation: Develop specific and contextualized indicators for evaluating the sociobioeconomy, focusing on environmental conservation, food security, local income generation, gender equity, transmission of traditional knowledge, and strengthening of community organizations. These indicators must be built participatively, adopted by public and private funders, and integrated into credit instruments, calls for proposals, and promotion programs.

Target Audience: SNF, public banks, civil society organizations, universities, investment funds, and multilateral organisms.

6.2.6. Advancing the Land Regularization of Sociobioeconomy Territories as a Condition for Access to Financing

Identified Problem: The legal insecurity of land tenure – aggravated by land conflicts, absence of collective titling, and slowness in regularization processes – is one of the main obstacles to access to credit by Indigenous peoples, quilombolas, riverine communities, and family farmers. Without land documents, enterprises face barriers to accessing credit lines, formalizing their organizations, and guaranteeing long-term stability. An identified impasse refers to the impossibility of accessing specific lines of financing for land regularization, such as purposes of Pronaf, by families living in undesignated public forests (type B), which generates a vicious cycle: without title, they cannot access credit; without credit, they cannot regularize.

Recommendation: Prioritize the land regularization of sociobioeconomy territories as a strategy for sustainable development and an instrument facilitating access to financing. This includes accelerating collective titling, integrating land regularization policies with financial programs, and recognizing models of traditional and collective land use in the eligibility criteria of public and private funds. It is also necessary to review rules that limit access to financing for regularization by populations in situations of legitimate and sustainable occupation.

Target Audience: Federal Government, INCRA (National Institute for Colonization and Agrarian Reform), State Institutes of Land, environmental agencies, SNF, investment funds, and philanthropic organizations.

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6.3. Comparison with Literature: What is New and What Persists

The comparison between the recommendations presented in this study and those systematized from the literature review (chapter 2) allows for the identification of important points of convergence regarding the challenges and strategic paths for strengthening the bioeconomy in the Legal Amazon. At the same time, it evidences original contributions of this work, originating from the empirical analysis of the financial mechanisms, institutional actors, and concrete experiences mapped in chapters 3, 4, and 5.

6.3.1. Convergence Points

There is broad convergence between this study and the literature regarding the need to expand access to financial instruments adequate to the Amazonian reality, overcome structural barriers that limit the action of local entrepreneurs, and strengthen the articulation between different financing sources. The creation of dedicated mechanisms,

the strengthening of alternative collateral such as guarantee funds, the recognition of technical assistance as a public policy complementary to financing, and the development of adapted metrics for impact measurement are recurring themes in various analyzed studies (Chiavari et al., 2024, Pinsky; Marcovitch; Val, 2024, Marcovitch; Val, 2024 and STCP, 2023).

The literature also already highlights the importance of land regularization, technical training, collaborative governance, articulation between sectoral policies, and the valorization of traditional knowledge as pillars for the advancement of the bioeconomy (Lopes; Chiavari, 2022, Veríssimo et al., 2023 and Saes et al., 2023). In general, the recommendations of this study converge with these diagnoses, reaffirming that the Amazonian bioeconomy requires integrated public policies, mechanisms adapted to its territorial and productive specificities, and financing models capable of operating in contexts of high sociocultural diversity.

6.3.2. Novel Contributions and Differentiators of This Study

Despite the convergences with the existing literature, this work contributes originally by proposing a typology of institutional actors based on an empirical survey (chapter 4), which allows for a more qualified analysis of the diversity of strategies, instruments, and priorities adopted by different groups of funders. By mapping 111 institutions and 159 financial mechanisms based on primary (interviews) and secondary data, the study offers an updated and systematized evidence base, contributing to expanding the level of detail in the literature on financing the Amazonian bioeconomy.

Another differentiator lies in the adoption of the sociobioeconomy category as an analytical key for evaluating the adequacy of instruments and institutional strategies. By distinguishing between bioeconomy in a broad sense and sociobioeconomy, the study explicates the productive, territorial, and cultural specificities that condition access to financing by Indigenous peoples, traditional communities, and family farmers, proposing recommendations focused on this segment. This focus contrasts with part of the literature that still treats the bioeconomy generically, concentrating on industrial sectors and larger-scale chains.

Another relevant aspect is the identification, in the mapped mechanisms and actors, of a mismatch between the wide diversity of instruments potentially compatible with the bioeconomy and the reduced number of financial products with a scope truly directed – either for the bioeconomy as a whole, or for sociobioeconomy. In this sense, the study advances in detailing structuring bottlenecks specific to the sociobioeconomy, such as the legal impasses related to land regularization (including in accessing credit for regularization), the difficulty in operationalizing alternative collateral, and the limits of current financial instruments to capture and value the positive impacts generated by sociobioeconomic

production models.

Additionally, the study advances in identifying innovative institutional solutions that contribute to expanding the reach and effectiveness of bioeconomy financing in the Legal Amazon:

- **Hybrid financial models with shared governance,** as observed in the Partners for the Amazon Platform (PPA), combine resources from different sources – philanthropic, public, and private – under multi-sectoral decision-making arrangements, promoting greater coordination and scale in Amazonian sociobiodiversity production chains.

- **Territorial arrangements with qualified local presence,** as in the case of BanparáBio and Banco do Brasil, involve the direct work of community agents, decentralized offices, and specific regional lines, favoring the adaptation of financial products to local realities.

- In the BASA case, the experience with **guarantees specifically structured** to expand access to rural credit for sociobiodiversity producers stands out, through supply contracts with partner industries and future revenues as collateral.

- **Funds and platforms structured for co-financing,** such as AMAZ (impact accelerator), articulate impact investors with technical support and results monitoring, contributing to strengthening early-stage sociobioeconomy businesses.

- **The use of local project designers and community technical assistants** – evidenced in the operational models of Banpará and Banco do Brasil – has proven essential to support small entrepreneurs in structuring projects, preparing proposals, and interacting with funders.

These solutions were systematized from empirical analysis and offer practical subsidies for the improvement of public policies and financial instruments aimed at the Amazonian bioeconomy.

Finally, by proposing a national bioeconomy financing strategy that articulates public, private, philanthropic, and multilateral sources – with goals, territorial priorities, and inter-institutional coordination mechanisms – the study contributes to filling an important gap in the literature and public policy: the absence of a structured financial framework coherent with sustainable development objectives for Legal Amazon.

6.3.3. Convergence Between the Structural Recommendations of This Study and the Recommendations from the Analyzed Literature

Below, Box 8 presents a synthesis of the convergences between the structural recommendations developed in this study and those systematized in the literature analyzed in chapter 2. The box is organized by recommendation from this chapter, followed by the identification of the thematic categories from the literature with which there is correspondence, as well as the associated specific recommendations.

This comparison evidences two central contributions of the study: on one hand, it reinforces recommendations already recognized as strategic for strengthening the bioeconomy in the Legal Amazon; on the other, it explicates analytical advances and operational proposals still little explored, contributing to a more directed and responsive agenda to the particularities of the region.

Box 8

Convergence between the structural recommendations of this study and the recommendations from the analyzed literature

Recomendação	Convergência com a literatura	
	Categoria	Recomendação da literatura
Establishing a national bioeconomy financing strategy that articulates public, private, philanthropic, and multilateral sources	Guiding Principles (G20)	• Adopting the 10 G20 principles to guide public policies and partnerships in bioeconomy (G20 INITIATIVE ON BIOECONOMY, 2024).
	Public-Private Partnerships	• Expanding financial instruments such as CBIOs, thematic bonds, and blended finance for underserved sectors (CPI, 2024; PAMPLONA, SALARINI e KADRI, 2021).
	Others	• Promoting collaborative and coordinated governance between ministries and sectors (LOPES e CHIAVARI, 2022; STCP, 2023).
Expanding dedicated bioeconomy financing mechanisms with specific criteria adapted to the amazonian reality	Public Policies	• Incentivizing the creation of mechanisms such as CBIOs and thematic bonds to expand and diversify financing for underserved sectors and regions (CPI, 2024).
	Public-Private Partnerships	• Expanding financial instruments such as CBIOs, thematic bonds, and blended finance for underserved sectors (CPI, 2024; PAMPLONA, SALARINI e KADRI, 2021).
	Financial Incentives	• Creating specific credit lines and tax incentives for bioeconomy (CPI, 2024; USP/INPA, 2024). • Offering working capital and advanced payment strategies (STCP, 2023).

Strengthening technical assistance as a public policy complementary to financing	Public Policies	• Expanding technical support and capacity building via ATERF (USP/INPA, 2024; PINSKY et al., 2024; STCP, 2023).
	Others	• Establishing an information base, advisory, and specific technical assistance for sociobiodiversity (SIMÕES, ALMEIDA e COSTA, 2021). • Fostering exchanges and teacher training for environmental education and bioeconomy development (USP/INPA, 2024).
Establishing specific socio-environmental impact indicators and metrics for bioeconomy projects	Failure Factor	• Lack of sustainability criteria and impact metrics (SAES et al., 2023; PINSKY et al., 2024).
	Others	• Establishing monitoring, evaluation, and traceability systems (LOPES e CHIAVARI, 2022; STCP, 2023).
Creating an integrated public platform of information on bioeconomy financing	Financial Incentives	• Promoting the dissemination of existing financing mechanisms (STCP, 2023).
	Others	• Establishing an information base, advisory, and specific technical assistance for sociobiodiversity (SIMÕES, ALMEIDA e COSTA, 2021).
Stimulating the creation of hybrid financial mechanisms with shared governance	Public-Private Partnerships	• Expanding financial instruments such as CBIOs, thematic bonds, and blended finance for underserved sectors (CPI, 2024; PAMPLONA, SALARINI e KADRI, 2021). • Stimulating inclusive and sustainable value chains through partnerships between companies, cooperatives, and communities (USP/INPA, 2024; LOPES, CORLETO e CHIAVARI, 2024; SILVA, SOLIANI et al., 2025).
	Others	• Promoting collaborative and coordinated governance between ministries and sectors (LOPES e CHIAVARI, 2022; STCP, 2023).

Strengthening instruments dedicated to the sociobioeconomy, with conditions adapted to the amazonian reality	Public Policies	• Expanding rural credit for sociobiodiversity products, improving sustainability criteria for concession (CPI, 2024; SIMÕES, ALMEIDA e COSTA, 2021). • Implementing a fiscal redistribution policy for sociobiodiversity products (SIMÕES, ALMEIDA e COSTA, 2021).
	Financial Incentives	• Creating specific credit lines and tax incentives for bioeconomy (CPI, 2024; USP/INPA, 2024). • Offering working capital and advanced payment strategies (STCP, 2023).
Structuring financing mechanisms based on results and ecosystem services	Public Policies	• Supporting policies for specific sectors such as meliponiculture, fishing, restoration concessions, and PSA (USP/INPA, 2024; STCP, 2023). • Creation of Protected Areas in undesignated public forests to generate revenue from PSA and forest-based businesses under management regimes and non-timber forest products (VERÍSSIMO, BRITO, et al., 2023).
	Financial Incentives	• Expanding and facilitating access to international climate funds and PSA mechanisms (CPI, 2024; VERÍSSIMO, BRITO et al., 2023).
Expanding support for grassroots organizations and sociobioeconomy cooperatives	Public-Private Partnerships	• Stimulating inclusive and sustainable value chains through partnerships between companies, cooperatives, and communities (USP/INPA, 2024; LOPES, CORLETO e CHIAVARI, 2024; SILVA, SOLIANI et al., 2025). • Developing differentiated markets for sociobiodiversity products, connecting small producers to buyers who value sustainable attributes (USP/INPA, 2024).
	Others	• Strengthening meso-institutions to fill technical and governance gaps (SAES et al., 2023).
Fostering territorial financing arrangements with qualified local presence	Others	• Promoting collaborative and coordinated governance between ministries and sectors (LOPES e CHIAVARI, 2022; STCP, 2023). • Strengthening meso-institutions to fill technical and governance gaps (SAES et al., 2023).

Developing adequate indicators for evaluating sociobioeconomy	Failure Factor	• Lack of sustainability criteria and impact metrics (SAES et al., 2023; PINSKY et al., 2024).
	Others	• Establishing monitoring, evaluation, and traceability systems (LOPES e CHIAVARI, 2022; STCP, 2023).
Advancing the land regularization of sociobioeconomy territories as a condition for access to financing	Políticas Públicas	• Advancing land regularization, including Indigenous lands, quilombola territories, conservation units, and settlements (USP/INPA, 2024; LOPES e CHIAVARI, 2022; VERÍSSIMO, BRITO et al., 2023). • Implementing contextualized policies for the different Amazons with local participation (LOPES e CHIAVARI, 2022; SAES et al., 2023).

7.

CONCLUSIONS

This study sought to offer contributions to the analysis of the bioeconomy financing ecosystem in Legal Amazon. Among them, the following stand out: (i) the systematization of a comprehensive and updated overview of existing mechanisms and institutions, with the proposition of a typology of actors and financial instruments; (ii) the systematic comparison between the recommendations of this study and those present in the literature, allowing for the identification of both consolidated convergences and analytical and operational advances still little explored; (iii) the identification of structuring bottlenecks specific to sociobioeconomy, highlighting regulatory, land tenure, and credit access obstacles; and (iv) the systematization of concrete examples of innovative operational and financial arrangements – such as structured guarantees, territorial hubs, and hybrid funds –, which offer practical inputs for designing instruments more adapted to the realities of Amazonian sociobioeconomy and for overcoming the bottlenecks mapped throughout the study.

Some limitations of the study, however, should be noted. Firstly, financial institutions and mechanisms tracking was not exhaustive. Although it adopted a broad data collection strategy – combining research in secondary sources, consultation of public documents, interviews, and circulation of a questionnaire – it is possible that relevant institutions, especially those with localized operations or initiatives not yet documented, were not captured in the study. **The systematized data should, therefore, be interpreted as a qualified sample, but not representative of the entire universe of existing actors and instruments.** Among the subsidized rural credit mechanisms, for example, the considered lines were those offered by the most relevant institutions in rural credit or in regional operation, not the totality of institutions offering this type of mechanism. The research on the three largest commercial banks prioritized specific products for bioeconomy, not including generic lines from these institutions that serve any business. On the other hand, generic lines from public development institutions with a strong presence in the region and serving bioeconomy related audiences were considered, given the greater attractiveness of subsidized rates for nature-based businesses.

Secondly, the study's focus was the identification and typological analysis of financial mechanisms, and not on the volume of resources effectively disbursed by each one. This methodological decision aimed to understand the diversity of formats, capital origins, and operational strategies in the financing ecosystem, but implies a limitation in the ability to estimate the relative financial weight of each type of instrument or institution.

An important limitation related to the availability and level of disaggregation of the data was also identified. **Much public information about financial mechanisms may not be**

updated or may lack sufficient detail to allow for more precise comparative analyses. Whenever possible, we sought to verify the validity of the mechanisms in the present year (2025); however, there may be cases where sources were outdated, and it was not possible to confirm the continuity of operations with the responsible institutions. Furthermore, for several mechanisms, in-depth data on eligibility criteria applied in practice were not obtained, which limits the assessment of the effectiveness of these instruments.

Additionally, a possible bias related to the concentration of information on more formalized or institutionalized projects is acknowledged. **Informal or early-stage community initiatives, often with less visibility or public documentation, tend to be underrepresented in the survey,** which may generate a distorted perception of the real degree of access to financing by grassroots organizations.

Another important limitation refers to the nature of the identified financial mechanisms. Most mapped instruments were not originally conceived based on the specificities of the Amazonian bioeconomy or sociobioeconomy. In most cases, these are generic instruments – such as traditional credit lines, innovation calls for proposals, or investment funds – that are compatible with the concept of bioeconomy adopted in this study but were not designed with an exclusive focus on this sector. This finding is relevant for a critical reading of the data, as it reveals both the breadth of existing possibilities and the absence of instruments specifically aimed at the reality of Amazonian territories.

Finally, although the study sought to represent different perspectives and institutional profiles through interviews and case analyses, the limited scope of these interactions does not allow for generalizations about the entire ecosystem. The study favors a qualitative and interpretative approach, aimed at identifying patterns, bottlenecks, and opportunities, but does not aim to build an exhaustive statistical portrait of bioeconomy in the Legal Amazon.

Based on this, opportunities for further development of this study are presented below, aiming to promote an open agenda for the creation, monitoring, and dissemination of financial mechanisms, to be developed in partnership with public, private, philanthropic, academic, and civil society institutions that share the commitment to a more inclusive, territorialized, and transformative bioeconomy.

7.1. Financing Volume Analysis of Mapped Mechanisms

This study focused on the typological characterization of mechanisms and institutional actors. **Future studies on the volume of resources effectively disbursed by each type of mechanism – including historical series, average size of operations, allocation criteria, and territorialization of investments – could help identify which instruments, among those mapped, concentrate the largest financial flow and which remain underutilized or have limited reach.**

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7.2. Creation of a Public, Interactive, and Continuously Updated Database

The database created by this study can be used as a basis for an interactive tool with continuous updating to:

- Facilitate access for entrepreneurs and local organizations to available financing opportunities.
- Allow operating institutions of the mechanisms to update their data regularly.
- Support the formulation of public policies based on updated evidence.
- Foster transparency and articulation between different funding sources.

The creation of aggregate indicators and dashboards for monitoring the bioeconomy financing ecosystem is also suggested, with periodic updates and disaggregation by type of mechanism, institution, territorial focus, and beneficiaries. Such dashboards can support strategic planning, public transparency, and accountability among actors. The governance of this system could be shared among public institutions, philanthropic networks, and civil society organizations operating in the Amazon.

7.3. Development of Specific KPIs for Sociobioeconomy Projects and Impact Evaluation of Financed Projects

The construction of KPIs adapted to the dynamics of sociobiodiversity – such as environmental conservation, strengthening of community governance, transmission of traditional knowledge, local income generation, gender equity, and food sovereignty – is essential to:

- Enable consistent project monitoring.
- Facilitate accountability to public, private, and philanthropic funders.
- Foster the recognition and valorization of these productive models in public policies and promotion calls for proposals.
- Increase the capacity of community organizations to negotiate with funders under more symmetrical conditions.

The collaborative development of these KPIs is recommended, involving universities, funding agencies, civil society organizations, and collectives of local producers. This agenda can benefit from participatory methodologies and the incorporation of traditional knowledge into evaluation criteria.

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7.4. Mapping of Non-Institutionalized Community Experiences

The development of complementary field research and financial ethnographies is recommended, aimed at identifying community financing forms, informal support networks, cooperative arrangements, and solidarity models that currently sustain sociobioeconomic initiatives.

7.5. In-Depth Analysis of Specific Financial Instruments

It is proposed to conduct specific studies on:

- Mechanisms with the greatest potential for adaptation to the sociobioeconomy, such as community guarantee funds, flexible microcredit lines, and instruments based on supply contracts.

- Innovative instruments already in operation, such as Green CRA (Agribusiness Receivables Certificate), Green CPR (Rural Product Note), Fiagro (Agribusiness Investment Funds), blended finance, and payments for ecosystem services, focusing on their viability for Amazonian contexts.

- Experiences of hybrid and multi-sectoral funds, with shared governance and criteria adapted to contexts of low land tenure formalization.

8.

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9.

ANNEXES

9.1. Annex 1 – List of Mapped Actors and Mechanisms

Institution	Mechanism
No associated institution	
	Green CPR (Rural Product Certificate) (CPR verde)
	Green CRA (Agribusiness Receivables Certificate) (CRA verde)
	Fiagro
	Títulos Amazônia
AB InBev	
	100+ Accelerator
Agência de Desenvolvimento de Roraima (Desenvolve RR)	
	Banco do Povo
	Rural credit for costing or investments (Crédito Rural para Custeio ou Investimentos)
	Industrial development fund of the State of Roraima – FDI (FDI – Fundo de Desenvolvimento Industrial do Estado de Roraima)
	State Guarantee Fund – FEA (FEA – Fundo Estadual de Aval
	Fixo Empreendedor
	Social and Economic Development Fund of ths State of Roraima – FUNDER (FUNDER - Fundo de Desenvolvimento Econômico
	e Social do Estado de Roraima)
	Giro Empreendedor (Entrepreneurial Working Capital)
	Jovem Empreendedor (Young Entrepreneur Program)
Agência de Fomento do Estado de Tocantins (Fomento Tocantins)	
	Microcredit
Agência de Fomento do Estado do Amapá (Afap)	
	Afap Microempresa e empresa de pequeno porte

Agência de Fomento do Estado do Amazonas (Afeam)	
	+Crédito Amazonas – Afeam Agro (Demais Atividades Agropecuárias)
	+Crédito Amazonas – Afeam Agro (Pesca Artesanal e Pesca Manejada)
	+Crédito Amazonas – Fundação Estadual dos Povos Indígenas do Amazonas - FEPIAM
	+Crédito Amazonas – Secretaria Executiva de Trabalho do Amazonas – SETEMP
	+Crédito Amazonas +CRÉDITO INOVAÇÃO
Agência de Fomento do Estado do Mato Grosso (Desenvolve MT)	
	Desenvolve Empreendedor
	Desenvolve Invest Rural - Invest Rural Equipamentos
Amazon	
	Climate Pledge Fund
Amazon Investor Coalition	
	Amazon Bioeconomy Small Grant Evaluation Facility
Anjos do Brasil	
	Investimentos-anjo em startups
Aqua Capital	
	Ag & Food PE Fund III
ASN Impact Investors	
	ASN Biodiversity Fund
Banco da Amazônia (BASA)	
	Amazônia Empresarial Verde
	Amazônia Rural Verde - FNO ABC/Biodiversidade
	Pronaf Bioeconomia
	Pronaf Floresta
Banco do Brasil (BB)	
	Crédito de Investimento - Pronaf ABC+ Bioeconomia
Banco do Estado do Pará (Banpará)	
	Banpará Capital de Giro
	Banpará Comunidade - Batedor de Açaí
	Crédito do produtor
	Microdrédito Banpará Bio

Banco do Nordeste (BNB)	
	FNE Inovação
	FNE Verde
Banco Itaú	
	ABC + Bioinsumos
Banco Nacional de Desenvolvimento Econômico e Social (BNDES)	
	Finem Meio Ambiente
	Floresta Viva
	Fundo Amazônia
	Fundo Clima - Florestas Nativas
	Programa BNDES Florestas
	Programa Crédito Agropecuário Empresarial de Custeio
	Pronaf Agroindústria
	Pronaf Bioeconomia
	Pronaf Microcrédito
Bezos Earth Fund	
	Grants
BID	
	Amazonia Sempre
BID / Banco do Brasil / CAIXA / BNDES	
	ETF Amazonia para todos (a ser implementado)
BID Lab	
	Amazon BeEco
	ReGenerate para a Amazônia
Brazil-UK Pact	
	Brazil-UK PACT Country Fund
BTG Pactual	
	Timberland Investment Group
Caixa Econômica Federal (Caixa)	
	Fundo de Desenvolvimento da Amazônia
	Fundo Socioambiental Caixa
	Programa de Fomento às Atividades Produtivas Rurais
	Pronaf Agroindustria
Campo Capital	
	Campo Impact Fund
CAPDA/SUFRAMA//ME	
	PPBIO
Catto Shaw Foundation	
	Grants

Centro de Empreendedorismo da Amazônia	
	Amazônia B/ Amazônia Up
CertiAmazônia (Fundação Certi)	
	Sinapse da Bioeconomia
Charles Stewart Mott Foundation	
	Mott Foundation's Environment program
Climate and Land Use Alliance (CLUA)	
	CLUA - Brazil Initiative/ Global Initiative
ClimateWorks Foundation	
	Sustainable Finance Programme
Comissão Europeia	
	AL-INVEST Verde
	Latin America Investment Facility (LAIF)
Conexus	
	CrediAmbiental
	CX Investimentos Socioambientais
	Fundo Socioambiental Conexsus
Conselho Indígena de Roraima	
	Fundo Rutî
Conselho Nacional das Populações Extrativistas	
	Fundo Puxirum
Cooperativa de Crédito Rural com Interação Solidária (Cresol)	
	Proagro
Din4mo	
	Programa Inovadores de Impacto
EcoEnterprises Fund	
	Fundo de Investimento para Soluções Baseadas na Natureza
Ecotierra	
	URAPI Sustainable Land Use Fund
ELAS – Social Investment Fund	
	ELAS Social Investment Fund
Embrapii / BNDES	
	Inova+
Embrapii / Sebrae	
	Inovação para pequenos negócios e start-ups
European Union "Global Gateway"	
	European Fund for Sustainable Development+ (EFSD+)
FARM Rio/Instituto Regatão Amazônia	

	RE-FARM CRIA Coração da Floresta
FASE	
	Fundo DEMA
Federação das Organizações Indígenas do Rio Negro	
	Fundo Indígena do Rio Negro
Finance in Motion	
	Arbaro Fund
	eco.business Fund
	LAGreen
Finep	
	Finep start up
Finep / MCTI	
	Pró-Amazônia/ FNDCT
	Projeto Centelha
Força-Tarefa de Governadores sobre Clima e Florestas	
	Janela de Financiamento para a Inovação GCF
FUNBIO	
	Fundo da Amazônia Oriental
	Projeto Copaíbas
Fundação Amazônia Sustentável	
	Aporte em projetos
Fundação Banco do Brasil	
	Programa ECOFORTE
Fundação CERTI	
	Jornada Amazonia/ Sinergia Investimentos
Fundação Toyota do Brasil	
	Editais anuais
Fundación Avina (coordinator)	
	BASE (Building Approaches to fund local Solutions with climate Evidence)
Fundo Brasil	
	Transição justa e trabalho digno: bem viver para trabalhadores dos campos das águas e das florestas
Fundo Casa e FSA CAIXA	
	Teia da Sociobiodiversidade
Fundo Casa Socioambiental	
	Programa Casa Amazônia
Fundo de Sustentabilidade Hydro	
	Editais variados

Gávea Angels	
	Investimentos-anjo em startups
Global Environment Facility (GEF)	
	GEF Small Grants Programme
	Programa Paisagens Sustentáveis da Amazônia
Gordon and Betty Moore Foundation	
	Andes-Amazon Initiative
Green Climate Fund (GCF)	
	Amazon Bioeconomy Fund
Grupo JBS	
	Fundo JBS pela Amazônia
Hewlett Foundation	
	HF Environment Program
Idesam	
	Aceleradora Amaz
Impact Earth	
	Amazon Biodiversity Fund
Instituto Amazônia+21	
	Facility de Investimentos Sustentáveis (FAIS)
Instituto Clima e Sociedade (ICS)	
	Portfólio economia de baixo carbono
Instituto Conexsus	
	Fundo Socioambiental Conexsus
Instituto Humanize	
	Programa Uso Sustentável
Instituto Ibirapitanga	
	Programa Sistemas Alimentares
Instituto Ouro Verde	
	Banco Raiz
Instituto Sociedade, População e Natureza	
	Fundo Paisagens Produtivas Ecossociais (PPP-ECOS)
Kaeté Investimentos	
	FIP Empresas Sustentáveis na Amazônia
Kaszek Management	
	Fundos VC
KPTL	
	Amazonia Regenerate Accelerator and Investment Fund
KPTL/ Fundo Vale	

Institution	Mechanism
	Fundo de Floresta e Clima
Latimpacto	
	Programa ecossistêmico Pan-Amazônico
MAPA/GIZ	
	Bioeconomia e Cadeias de Valor
Maritaca Fund	
Mirova	
	Brazilian Biodiversity Strategy
MMA/PNUD	
	Projeto Piloto Floresta + Amazônia
Moringa	
	Moringa Fund
MOV Investimentos	
	MOV - FIP MOV II
Movimento Interestadual das Quebradeiras de Coco Babaçu (MIQCB)	
	Fundo Babaçu
Natura	
	Amazônia Viva Financing Mechanism (Mecanismo de Financiamento Amazônia Viva)
Natura, VERT e FUNBIO	
	Mecanismo de Financiamento Amazônia Viva
NESsT	
	Acceleration Portfolio
	Lirio Fund (Latam)
	NESsT Amazônia
Nia Tero	
	Grants for Indigenous People
Norwergian Agency for Development Cooperation (NORAD)	
	Norway's International Climate and Forest Initiative (NICFI)
Oak Foundation	
	Environment Programme
ONU, Brasil e Consórcio dos Estados da Amazônia Brasileira	
	Brazil-UN Fund for Sustainable Development of the Amazon
Petrobras / Régia Capital	
	Fundo Petrobras de Bioeconomia
Podáali	

	Indigenous Fund of Brazilian Amazon (Fundo Indígena da Amazônia Brasileira)
Porticus	
	Parcerias
Purpose Earth	
	Purpose Earth Grant Award
Rainforest Trust	
	The Brazilian Amazon Fund
Rede de Produtores Orgânicos da Amazônia Matogrossense (REPOAMA)	
	Fundo Rotativo Solidário
Régia Capital	
	Plataforma de investimentos sustentáveis
Sebrae	
	Inova Amazônia
Sistema de Cooperativas de Crédito do Brasil (Sicoob)	
	Pronaf - Bioeconomia
	Recursos Próprios Livres (RPL)
Sistema de Crédito Cooperativo (Sicredi)	
	Seguro Floresta
SITAWI	
	Forestry Insurance (Seguro Floresta)
The Nature Conservancy	
	NatureVest
United Nations	
	International Fund for Agricultural Development (IFAD)
	UN Multi-Partner Trust Fund for Sustainable Development in the Legal Amazon (Amazon MPTF)
World Transforming Technologies (WTT)	
	Centro de Orquestração de Inovações (COI)
WWF/ South Pole	
	Landscape Resilience Fund (LRF)
Wyss Foundation	
	Wyss Campaign for Nature

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ABDE

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