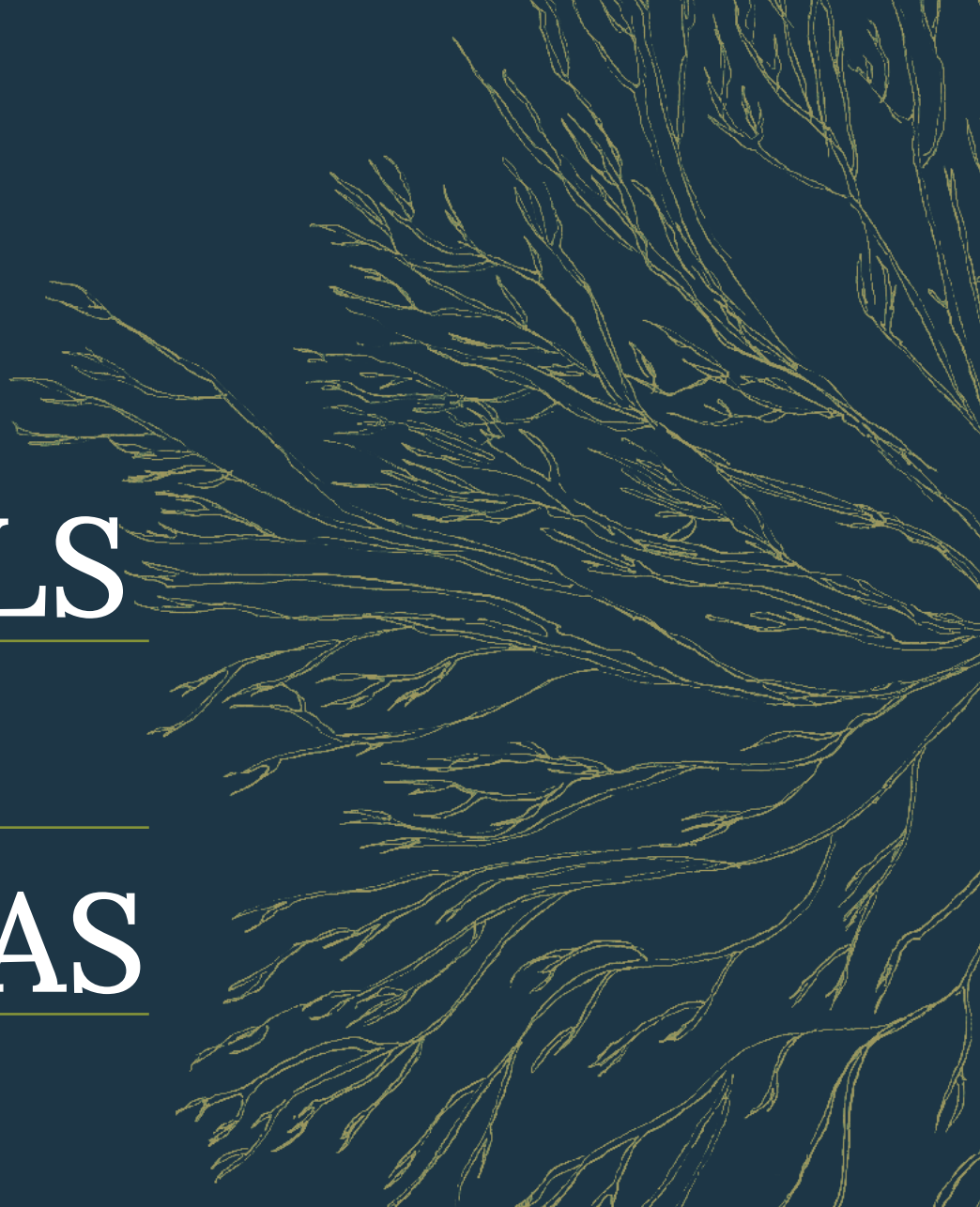
AMAZON
CONCERTATION

PROPOSALS FOR THE AMAZÔNIAS

AN INTEGRATED APPROACH



Proposals for the Amazônias:
an integrated approach

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an integrated approach

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Towards an ambition for the Amazônias

Anyone who sees the exuberance of the Amazon and its enormous cultural and biological diversity may not notice the frantic activity that takes place under their feet. It is in the soil that tiny beings - the fungi - form extensive networks, creating a connection capable of nourishing and sustaining all life forms that comprise the largest tropical forest in the world.

The way the Amazon Concertation works, seeking to foment transformation, mimics this vital function of fungal networks. By building bridges among those who dream of greater ambitions for the Amazônias and for Brazil, the Concertation helps support the changes that must occur beyond the surface. Our objective is above all to ensure the well-being of those who live in the Amazon region, while respecting all life forms. Thus, the Concertation strives to offer a democratic space for proper debate on Amazonian issues to further reflect on what Brazilian society wants for the Amazon.

The present document consolidates everything the Concertation has delivered since its creation, in 2020. It also reflects the advances and maturation of debates in this forum, which brings together different views of society regarding a region that is of strategic importance for Brazil and for the world.

More than just putting them together, this document improves on the main messages of two previous documents released by the network: *An Agenda for the Development of the Amazon* and *The first 100 Days of Government: proposals for an integrated agenda for the Amazônias*. The first document was presented at the 26th United Nations Conference of the Parties (COP26) on Climate Change in 2021. And the second was prepared in 2022, based on an intense process of listening and collective creation involving network members, through thematic rounds of conversation.

The Agenda outlined major courses of action needed for the development of the region through a bigger-picture lens, considering the diversity of territories and with a long-term horizon in view. The second document turned this agenda into concrete proposals, with regulatory support. These proposals might be implemented by Brazil's 2023 elected representatives for the executive and legislative branches in their first 100 days in office, as well as throughout their 2023-2026 term.

After a troubled period in which Brazilian democracy and its institutions were threatened, the country is now experiencing a new political context, which opens up broader perspectives for dialogue, particularly for cooperation in the implementation of structuring and concrete initiatives in the Amazon region, explored in previous documents. But for this to be effective, there are some unavoidable assumptions.

It will be crucial to understand the correlations among the themes of the Amazon development agenda and to place the local population at the center of this building process. Inclusion must encompass all the nearly 30 million inhabitants of the various Amazônias. This new perspective subverts the outdated logic of separate sectors, addressing interdependent issues instead. It also overthrows the view that has historically imposed "progress" from the outside to the inside and "from the top down", not considering local demands and particularities. Such a view served as a model for plundering substantial resources for the benefit of a few. At the same time, the region went through environmental degradation, climate imbalance, and still ranks among the worst in terms of socioeconomic indicators in the country.

The paths contained in this document, therefore, stem from serious reflection on a more integrative and inclusive approach for the region. An approach based on the value of natural and human capital, in search of political and economic equations that may contribute to the well-being of local populations. This entails sanitary, education, security and infrastructure conditions equivalent to the best in the country, at the same time guaranteeing the protection of the region's natural and cultural heritage.

Providing quality of life for its inhabitants, with social justice and reduced inequalities is, above all, an ethical imperative. And this is also what may afford the region higher levels of economic, technological and scientific development. In that sense, the present document proposes to frame and understand relationships among interdependent themes for formulating policies, initiatives and actions. This is in line with integrated development approaches, such as the UN 2030 Agenda – a necessary step beyond combating and curbing deforestation and forest degradation. For this agenda to materialize, the business sector must play a fundamental role, as well as must public and non-governmental organizations.

The first section of this document updates the priority fronts and proposals for related initiatives, considering the Four Amazônias: Conserved Amazon, Transition Amazon, Converted Amazon and Urban Amazon. The second section presents key connections within the Amazon development agenda. We consider six structuring themes - among many others - in the context of the Brazilian Legal Amazon: bioeconomy, indigenous peoples and traditional communities, education, health, security, and science, technology and innovation (STI). The exercise of framing and understanding the correlations among themes will continue

within the scope of the Concertation, guiding and filling up future documents.

Throughout this publication, illustrations by Hadna Abreu blend into the content and invite us to reflect on how connections, not always visible, may reveal synergies and paths to cooperation. Inconspicuously, tiny organisms interconnect and feed the ecosystems that sprout from the ground and make it possible for all life forms - including humans - to prosper.

With the same stroke of Hadna Abreu's art, the publication about the first 100 days of government had used graphic representations to sow the seeds in the form of initiatives and public policy. Jointly and combined in a farming technique known as muvuca, these seeds may give rise to a rich and biodiverse forest.

That forest, however, needs a connecting activity in its substrate. Fungi and their networks, working as an actual internet of the natural world, interconnect life and ensure its maintenance. Likewise, the Concertation hopes that the "Proposals for the Amazônias: an integrated approach" will result in a resilient landscape for all Amazônias and their inhabitants.

Enjoy your reading!
Fernanda Rennó and Lívia Pagotto
Executive Secretariat

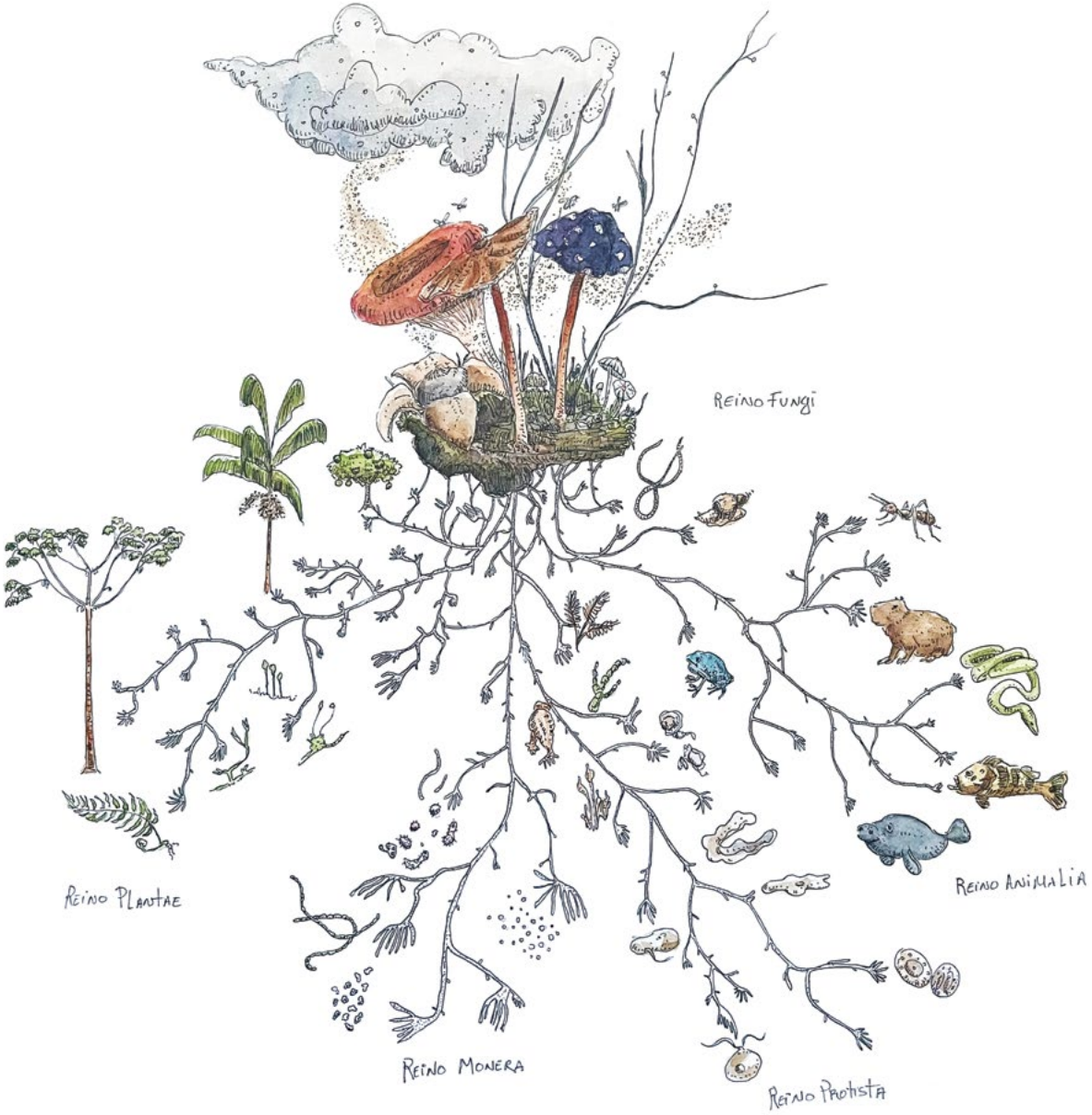
Mycena cristinae

Bioluminescent, dubbed "forest sparkles", they indicate paths in the dark nights; they are also great recyclers of organic matter in their environment.

The process of evolution produces a pattern of relationships among species, of biological links among individuals and generations, often graphically represented in the form of a tree. The tree of life is a sacred symbol in different cultures. In different ways, it depicts the relationship between heaven and earth, where the leaves and branches multiply and mature and the trunk and roots support the permanence of these movements. A symbol that represents immortality, fecundity and creation. However varied the versions of this representation might be, fungi have always been present, and they inspire this new version of the tree of life in the present document.

The Tree of Life, Art & Science, free representation of the Tree of Life, based on Margulis, 1982.

Illustration by: Hadna Abreu, 2023


Reino Fungi
Reino Plantae
Reino Animalia
Reino Monera
Reino Protista

Summary

Executive Summary

The present document proposes initiatives for the Amazon region through an integrated and inclusive approach, based on the simultaneous appreciation of natural and human capital. This approach seeks political-economic-environmental-and-social equations that could promote the well-being of local populations and original peoples. It includes sanitary, education, security and infrastructure conditions equivalent to the best in the country. And, at the same time, it must ensure the conservation of the megabiodiversity of the Amazon as well as climate protection.

Providing quality of life with social justice and reduced inequalities is, above all, an ethical imperative. And this assurance should concomitantly afford the region higher levels of economic, technological and scientific development. Only then can the Amazon become a true green power in Brazil, thus enabling the country to take on an increasingly vital role on the international stage.

The proposals are organized under 19 themes, along with a practical exercise on an application of the integrated approach. Connections are observed initially from the perspective of six themes: bioeconomy, science, technology and innovation (STI), education, indigenous peoples and traditional communities, health, and security. Although not the only ones – new structuring themes should emerge from the continuity of this work –, these are key issues. They are frequently at the center of local, regional, national and international public debate focused on environmental conservation and on improving the quality of life in the Amazon region. Moreover, these themes connect to a host of other

environmental (such as biodiversity), social (food and nutrition security), and economic (financing) issues.

By identifying connections among themes and observing their interdependence, this document provides inputs to untangle critical knots in the complex web of human, political, economic and environmental factors that prevent the advancement of sustainable development in the Brazilian Legal Amazon. Inspired by the Amazonian fungal networks, a powerful underground mesh that nourishes the forest, this report takes a step further regarding the deliverables of the Amazon Concertation network since its inception in 2020. It also reflects the advances and maturation of debates in this forum, which brings together different views of society regarding a region that is of strategic importance for Brazil and for the world.

This report consolidates and enhances key messages from two previous documents released by the Concertation: *An Agenda for the Development of the Amazon*, presented at the 26th United Nations Conference of the Parties (COP26) on Climate Change in 2021; and *The first 100 Days of Government: proposals for an integrated agenda for the Amazônias*, prepared in 2022. And it advances in the application of a new perspective on the Amazon development agenda that considers the connections among themes. This is essential because many of the themes and sectors on that agenda are interdependent. Initiatives in one of them may lead to synergistic and powerful interactions among sectors. But these same initiatives may also cause overlaps and trade-offs with other themes and sectors connected to the first, blocking or halting advances. Currently including more than 600 participants and 250 organizations, the Concertation has consolidated a space for reflection and propositions about what Brazilian society wants for the Amazon. Its reason for existence is to encourage concerted cooperation among people and organizations that want a sustainable present and a sustainable future for the Amazônias and for Brazil.

The knowledge network mobilized through and by the Concertation devises the Amazon as a landscape, that is, as a space perceived differently by the multiple players that comprise it. According to the relationship mesh woven among these different populations and their territory, space is apprehended, planned and dreamed of in different ways: science and technology analyze what is visible, whereas the local community shares knowledge and feelings related to the places. And art can represent this landscape in different ways and at different points in time. When one looks at a space through its landscapes, there is a dialogue with colors, sounds, topography and traditions, with past history and with the desired future.

In the Amazon, this landscape materializes in at least four configurations: the well-preserved forest, the forest at risk due to changes in land use, the areas already converted for the produc-

tion of agricultural and mineral commodities, and the urban Amazon, which is home to a major share of the nearly 30 million inhabitants of the region. Far from simplifying a complex scenario, the model comprising these Four Amazônias contributes to listing prevailing activities for each of these realities, as well as to identifying inequalities and establishing priorities for targeted action.

The Concertation realizes that, in addition to the work of organized civil society, the business sector plays a fundamental role, together with public and non-governmental organizations, so that the agenda presented here becomes a reality. This implies integration among different dimensions: the chain of command and control, such as environmental inspection and the fight against crime; the agenda to reduce inequalities and guarantee basic services; economic opportunities in line with decarbonization; and the appreciation of environmental and cultural assets.

There are no single or simple answers to this challenge, nor are there definitive conclusions. In this sense, the Amazon development agenda may be considered a wicked problem – difficult to understand and, because it is dynamic, difficult to manage. Even when the dimension of a wicked problem is minimally well-defined, the solutions adopted to face it are never categorical, as they also arise during the action process. Each attempt to come up with a solution contributes to changing the understanding of that problem, which is in turn redefined in light of the emerging alternatives, in a constant process of transformation. Likewise, the debate on the Amazon is ongoing and cannot be resolved with a silver bullet.

At the same time, the Amazon offers a unique opportunity regarding the formulation of public policies for the future that would reconcile climate regulation, biodiversity protection and appreciation of the culture of original peoples and traditional communities. In addition to its importance for the country, the region has global reach and is a key element for climate balance and for the conservation of biodiversity. This requires efforts from different players in different places.

Therefore, the perspective for this region needs to be integrative, and by no means fragmented. Drawing on the metaphor of fungal networks, knowledge does not have a single root, but is created simultaneously from all points, under the influence of different observations and contexts, in a permanent process of transformation.

In this draft of roadmaps, structuring proposals, both specific and cross-sectional, and the correlations among them and the context in which they unfold are presented through a summary table, inter-thematic networks, infographics and sector snapshots/profiles. This document also shows the way the Concertation network operates, in addition to the assumptions and elements used in this integrated approach to the Amazon.

The Amazon Concertation

An environment for continually building an ambition for the Amazônias.

The Concertation integrates a space for reflection and propositions about what we want for the Amazon. And it does so by promoting exchanges among different views, congregating representatives of different groups, catalyzing resources for structured action and projects, and informing society about what is on their agenda.

Since its inception in 2020, the Amazon Concertation network has sought to deal with the complexity of this region, which is unique on the planet, strategic for Brazil and fundamental for the world and its climate balance. The Concertation is fully aware that the various Amazônias require a systemic approach, one that acknowledges and values the interdependence of its elements, and hence is invested in growing and evolving the debate on the model(s) of sustainable and inclusive development in the region.

The Legal Amazon is multifarious, spreading over 60% of Brazil, comprising nine states, and is home to almost 30 million people. The Amazonians include indigenous peoples, *quilombo-la* communities, traditional peoples-collective subjects, small and large rural landowners, residents of small and large cities, loggers and miners. Furthermore, it harbors a myriad of plant physiognomies, such as upland forests, floodplain and igapó forests, in addition to lavrado and cerrado savannas; from the perspective of the Concertation, the region unfolds into at least four distinct Amazônias. They range from conserved forests to urban centers, including transition areas at risk of deforestation, and others already converted due to human activity.

A place marked by such biological, physical and sociocultural heterogeneity requires an integrated approach, to be put into practice through a new framework. An approach in which different

views on development/envelopment coexist, in consonance with the diversity contained in these Four Amazônias. This approach must necessarily and above all guarantee the well-being of people, generating income and valuing natural capital.

From the perspective of engaging a wide variety of players in pursuit of quality of life in the region, the Concertation highlights the importance of strengthening the institutional capacities of indigenous peoples and traditional populations in their various dimensions. This includes their culture, their relationship with environmental conservation, their history and their political role. For this reason, we believe in Brazil's potential as a megadiverse country, both environmentally and culturally. And we endeavor to transform the Amazon into a paradigm that appreciates the role of the so-called Global South.

Far from trivial, this mission requires a joint effort from the many players and segments of Brazilian society. And it also calls for pan-Amazonian and international cooperation. This is why the Concertation network is steadily seeking to offer a space that allows for the creation of converging views to untangle critical knots about Amazonian issues. Our objectives are to encourage exchanges of opinions, building bridges among different views, to inform society about what is on the public agenda, and to bring together representatives of different groups to discuss cooperation strategies. The Concertation therefore stands as a space for reflection, proposition and action for the Amazônias.

Pillars

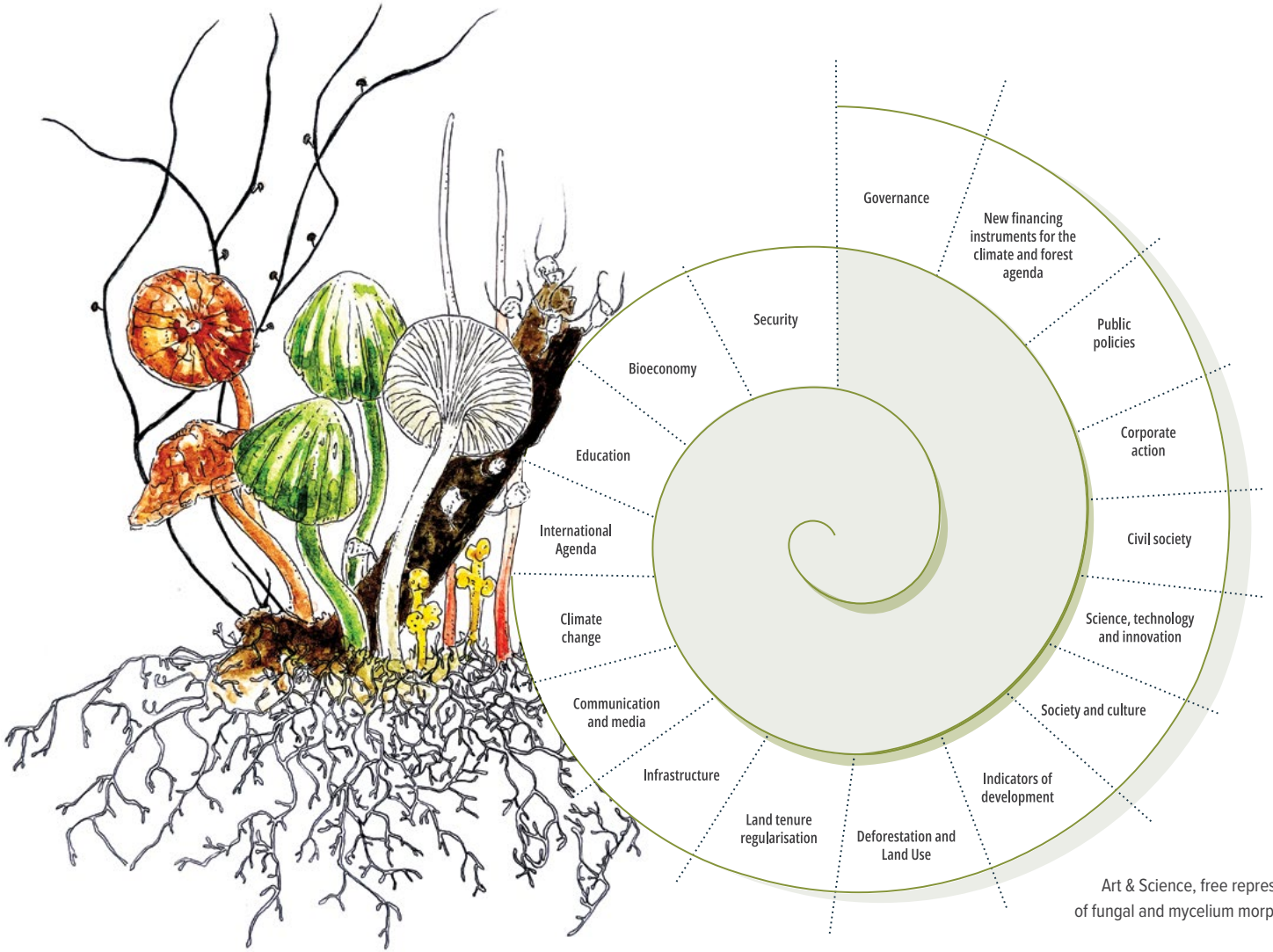
Development
Understanding development visions capable of curbing environmental degradation while reconciling natural capital and social justice.

Business
Businesses as key players in the development of the Amazon.

Governance
Collaboration and engagement with political forces at the federal, subnational and local levels.

Institutional
Strengthening the institutional capacities of both state and non-state public organizations.

Culture
A crucial and cross-cutting dimension for bridging technical and sensitive aspects of the landscapes.



Art & Science, free representation of fungal and mycelium morphologies

This space is created through direct dialogue in which members share knowledge and practices on the 17 major themes identified as essential to boost the development of the Amazônias. These themes are presented through the image of a spiral shape. This figure expresses a continuous and inexhaustible process of (re)cognition and deepening reflections.

Discussions on some of these topics have advanced to include the creation of working groups (WGs). These WGs focus on bioeconomy, education, youth, land tenure regularization and land use planning, social and territorial infrastructure, mining and political intelligence. It is through these groups that structuring projects are designed, framed, developed and monitored.

Since its inception, the network has already assembled more than 650 people from 250 organizations. Periodic meetings make it easier for participants to share knowledge and practices. At the same time, the dynamics of these meetings allow for participants' obtaining information and gaining a more comprehensive and qualified understanding of key issues for the Amazônias. Their common goal is to find the most efficient, effective and adequate paths for the development of the Amazônias.

The only requirement for participating in this valuable forum is to demonstrate a genuine interest in the Amazônias. This makes the initiative a democratic network that welcomes different views, with no need for consensus but for converging ideas.

The Concertation consolidates a space for reflection and propositions about what we want for the Amazônias. And it does so by promoting exchanges among different views, congregating representatives of different groups, catalyzing resources for structured action and projects, and informing society about what is on their agenda.

When it comes to the Amazônias, such a characteristic makes room for plural opinions on a topic that is in itself quite fragmented already and spread over many sectors. This fragmentation is what the Concertation strives to overcome in favor of a more integrative vision, so that some strands of the complex web of the Amazônias are weaved together, in all their characteristic interdependencies. In doing this, the network envisages a long-term structural change for the region. The first step in that direction was materialized through the publication of *An Agenda for the Development of the Amazon*, presented at the 26th United Nations Conference of the Parties (COP26) on Climate Change in Glasgow, in 2021. In that document, the Concertation proposed that the Legal Amazon be regarded as four Amazônias, so as to encompass the complexity and diversity of its territories. The document has also identified key issues on the development agenda and listed strategies to move forward with a regional development agenda.

The Agenda then gave rise to the report *The first 100 of government: proposals for an integrated agenda for the Amazônias*. In that report, a series of proposals regarding normative instruments for different topics on the agenda, prepared based on listening to various stakeholders in Brazilian society, were presented to the new federal and local representatives, elected in 2022. The reports released by the Concertation are prepared with the expectation that they will be appropriated in the process of collectively building institutional capacities to deal with the development of the Amazon. And that they may be incorporated by our representatives in office just like seeds that, when properly cultivated, will grow to produce flowers and fruit for society at large.

The document on the first 100 days of government drew upon the image of seeds and the *muvuca*, an assorted set of seeds with the potential to become a “forest” of public policies. The present document, in turn, through its visual narrative with the use of watercolors that accompany the text, explores the delicate – and at the same time powerful – fungal networks. They demonstrate the importance of interconnections that support and sustain socio-environmental ecosystems.

In all environments, natural or built by people, fungal networks connect and nurture communications among living beings through an activity that is often invisible and silent, but constant and vital. Fungal networks establish connections among beings. This is the image that inspires the Concertation from 2023 onwards.

Such an effort begins in this document, in which relevant connections among structuring themes for an Amazon development agenda are identified. It is based on the assumption that a good understanding of these relationships can prompt specific institutional cooperation and endorse synergistic strategies. And hence promote the advancement of the agenda as a whole.

Assumptions and elements of an integrated approach

It is imperative that we all embrace the complexity of the Amazon, establish connections and understand the territory as a landscape where rational and sensitive aspects supplement each other.

In addition to the network initiative set in motion by the Amazon Concertation, if we want to consider the region with an integrated and systemic approach, taking into account its various and diverse dimensions, we must reconcile quality of life and forest conservation. The growing crisis caused by multiple factors, such as the climate emergency, loss of biodiversity and increase in poverty, requires a change of mindset so as not to address interconnected issues in an isolated and linear way.

There are biological, geopolitical, geographic, cultural, socio-environmental and economic variables, among others, that are intrinsic to the occupation of the Amazônias and motivate reflections on public policy and investments. Keeping up with such complexity and diversity requires acknowledging the organic nature inherent to the formation of Amazon territories. Likewise, it requires incorporating these territories when preparing responses that may have a positive impact on local-regional-global socio-environmental challenges.

Other perspectives

On the threshold between the search for and the exchange of knowledge, a key element emerges: the landscape regard. A space with multiple players, as is the case in the Legal Amazon, is perceived differently by the people who belong to or are in it. That is, according to the relationship that exists among these different populations and this large territory, space is apprehended and planned in different ways.

Geastrum inpaense

Found in the Inpa area, they have a star shape; they grow in the soil and on leaves, and they do nutrient cycling and organic matter decomposition; species in this group are related with pharmacological active substances and with potential enzymatic degradation of waste. Discovered in 2014, the type locality of the species is in the state of Amazonas.

The landscape approach rests on three dimensions: time, space and people. And its source is the integration among: science and technology, which analyze what is visible, what is found in the form of data; listening to local communities, which share knowledge and feelings about places; and art, which expresses different languages and represents diverse ways of life. When one sees the world through its landscapes, there is a dialogue with colors, sounds, topography and traditions. And also with the imagination and myths that underlie the memory, the present and the future of this region.

In addition to bringing in this wealth of views and perceptions, the application of integrative perspectives in dealing with complex issues allows us to see not only the elements that make up the landscape, but also the relationships and connections among them. This invites us to build a more comprehensive and reliable view of the whole. This is how the Concertation sees these territories – as a landscape, bringing culture to the forefront of discussions and of action. Art is more than mere illustration; it is a source of sensitive information about the territory and its desired future.

The Four Amazônias

From the urban fabric of inland towns and capital cities to more isolated areas, the region encompasses different challenges imposed on public policy and on devising investment strate-

gies. Identifying sub-regions with their different spatial, temporal and human dimensions is fundamental for planning under an integrative paradigm.

In view of this, the Concertation identifies Four Amazônias, which, although connected, have characteristics that tell them apart. The first is the **Conserved Amazon**, notably found in the western portion of the biome. Direct access through roads is precarious and there is a greater expanse of protected lands, such as Conservation Units (UCs) and Indigenous Lands (TIs). The second is the **Transition Amazon**, in the center-east portion, where the forest is under pressure from changes in land use due to agricultural and livestock farming expansion. There is also the **Converted Amazon**, marked by intensive production of agricultural, energy and mineral commodities; and the **Amazon of cities**, which concentrates approximately 70% of the nearly 30 million inhabitants of the region.

Far from trying to simplify or isolate a complex scenario, the regionalization proposed by the Concertation lists prevailing activities for each of these areas. It also identifies regional inequalities and establishes priorities for initiatives with a positive socio-environmental impact. This examination of the Legal Amazon from the perspective of the Four Amazônias has also made it possible to clarify measures that should be part of a cross-sectional work agenda – a compilation in constant evolution.

This comprehensive view of the various Amazônias converges with that of the Amazônia 2030 project, which uses the categorization proposed by the Amazon Institute of People and the Environment (Imazon). That initiative identifies five areas for analyzing the region: the forested Amazon (39% of the Legal Amazon), the forested Amazon under pressure (29%), the deforested Amazon (11%) and the non-forested Amazon – *Cerrado* (21%), in addition to the urban Amazon.

Command and control policies, combating violations, land use planning, and incentives to research and entrepreneurship are some of the many needed action fronts for the entire region. Similarly, social and regional inequalities are common to the different Amazônias. They must be at the center of any development proposal aimed at keeping the forest standing, with social and productive inclusion, recognition of the role of local populations, and climate mitigation initiatives.

Connections among themes

Planning the sustainable development of the Amazon using the logic of a new economy that is more inclusive and in line with mitigation and adaptation to global climate change requires understanding the synergies and trade-offs among themes. Establishing connections among them is a strategic element, when

we become aware, for instance, that the untapped and manifold potentialities of the much desired “bioeconomy of the standing forest” are a consequence of the socio-biodiversity of the Amazon. And the latter, in turn, depends on protection to ensure the sustainability of new economies.

In the integrated view proposed by the Concertation, education in all its levels is directly associated with the prosperity of the economy, nourished by the ecosystem of science, technology & innovation. And there is also a connection with the appreciation of culture and traditional knowledge. The web of interdependencies and the links among themes show that responses can be amplified, and noise can be reduced if the relationships among connected sectors are considered.

Just as in the case of education, public security, the forest economy and health rely on access to energy and connectivity. In addition to quality of life in remote areas, all these elements are basic for making the Amazon context – in the capital cities and countryside areas – suitable and attractive for projects by local communities, scientists, entrepreneurs and investors seeking a new development model.

Integrated approaches[1] have become popular throughout the scientific and technical literature due to their potential to create a broader understanding and more effective responses to the management of contemporary crises, such as the climate emergency, water scarcity and food insecurity. These issues typically involve multiple, interconnected and dynamic factors. Reductionism and disciplinary approaches that isolate and focus on individual components tend not to be successful in coping with them.

The Amazon takes on a leading role when it comes to reconciling the economy of climate protection, of biodiversity and of valuing the culture of its original and traditional peoples with the reduction of social inequalities. Because contradictions have long dwelled in that region. From a broad perspective, it is home to the world’s largest reserve of biodiversity and regulates regional hydrological cycles, essential to the productivity of global commodities. At the same time, it has some of the worst socioeconomic indicators in Brazil.

In this sense, the advancement of development in the region requires the adoption of other perspectives to support planning and action in the various territories. By the logic of an integrated approach, the Concertation expands its regard to consider demands from the Four Amazônias. And thus coordinate collaborations from different sectors of society as well as timelines needed to manage a systemic transformation.

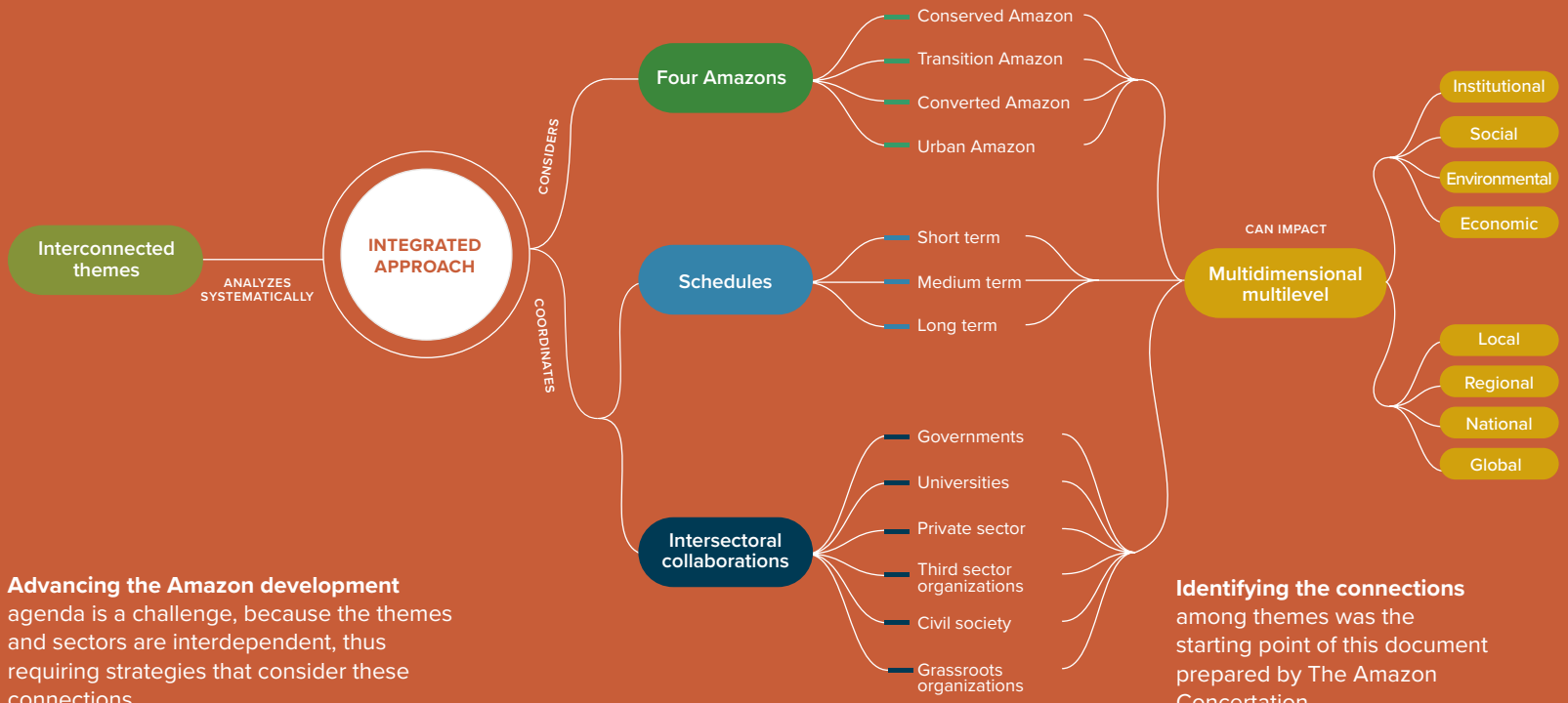
In this third document by the Concertation, we expect to provide a closer look at the relationships that emerge among themes in the Amazon development agenda. This framework may offer the grounds for reflection and for the elaboration of more inclusive and long-lasting solutions to untangle critical knots, with im-

Integrated Approach

Assumptions

It consists of a strategy that supports the analysis, planning, and management of the Amazonian development agenda and has the potential to systematically analyze interconnected topics.

It is an approach capable of considering the diversity of Amazonian landscapes and that coordinates sectors and schedules to maximize positive impacts across dimensions of development and at different geographical scales.



Advancing the Amazon development agenda is a challenge, because the themes and sectors are interdependent, thus requiring strategies that consider these connections.

Identifying the connections among themes was the starting point of this document prepared by The Amazon Concertation.

Knowledge does not have a single root, but is built collectively from the intersection of different interpretations and observations.

pacts on environmental, social and economic dimensions. This means examining interactions among different themes. It is a relevant change in perspective, as it allows sectors to observe synergies and trade-offs among their initiatives, which may increase their impact and reduce political and economic conflicts of interest. It may also guide intergovernmental cooperation and cooperation among sectors of society, boosting the concomitant advancement of various issues on the agenda.

Managing complexity

The Amazon Concertation initiative is one example of successful network articulation as well as application of an integrated landscape approach. Unlocking the Amazon development agenda entails dealing with complex, ambiguous and volatile environments in planning and decision-making. When facing the various, ever-changing elements, the question is not only the specific problem to be solved, but ongoing evaluations of the broader context - environmental, social, cultural and political - in which those elements are inserted.

In a scenario full of complexities and with a global reach, the Amazon demands efforts from different players in different places for devising new economic models that could reconcile, in a more balanced equation, the value of natural and social capital and income generation. The many sectors of society must cooperate with each other for the survival and evolution of the environment as a whole.

Drawing once again on the metaphor of the fungal network, knowledge does not have a single root, but is collectively built from the intersection of different interpretations and observations. However, for an enhanced understanding regarding which solutions would be best for the Amazônias - solutions that are continuously redefined in the light of emerging alternatives -, coordination is key: vertical, among spheres of government; and horizontal, among sectors and territories, in the short, medium and long term. Institutional arrangements must be able to articulate interests and capabilities consistent with the heterogeneity of local social structures (LOTTA E FAVARETO, 2016)[2].

PART 01

AN INTEGRATED AGENDA THEMES AND INITIATIVES

part 01

An integrated agenda
Themes and initiatives

The table below organizes the main initiatives proposed in this document. They are distributed into specific, structuring and cross-cutting fronts of action for the Four Amazônias. To a large extent, these fronts are linked to the activities of the Government, but they also call for the control of society so that they are more effective for all social groups in the coming years. The table reflects the evolution of proposals that have been continually discussed among members and partners of The Amazon Concertation network, through its Working Groups, plenary sessions and webinars.




CONSERVED AREAS	TRANSITION AREAS	CONVERTED AREAS	CITIES
General			
• Forest conservation • Socio-bioeconomy • Extractivism, activities with low environmental impact	• Curbing deforestation • Regeneration, restoration, sustainable forest management • Mosaics (forest fragments, productive systems, agroforestry systems - SAF) • Sustainable biomass production	• Agricultural and mining commodities • Integrated Crop-Livestock-Forestry Systems (ILPF) • Sustainable forest management, recovery of native and exotic species, food growing and animal husbandry • Traceability, impact mitigation • Sustainable biomass production	• Services, manufacturing, entrepreneurship • Research hubs, RDI, industrial hubs for high-tech sectors (drugs, cosmetics, green chemicals) • ST: making production systems more complex and integrated (extractivism, handling and processing, use of molecules and sophisticated industrial processes)
Specific fronts			
ECONOMY			
• Amazon as a catalyst region for Brazil's low-carbon economy • Path to decarbonizing the economy of the Legal Amazon, creating opportunities, generating income and employment, and valuing local cultures			
• Forest conservation • Socio-bioeconomy • Creative economy • Solidarity economy • Nature-based tourism	• Forest restoration • Nature-based Solutions (NbS) • Sustainable forest management • Agroforestry systems (AFS) • Integrated Crop-Livestock-Forestry Systems • Socio-bioeconomy • Forest concessions • Native forestry • Strengthening existing agri-food supply chains • Nature-based tourism	• Forest restoration • Agroforestry systems (AFS) • Nature-based Solutions (NbS) • Forest concessions • Production of agricultural and mineral commodities • Integrated Crop-Livestock-Forestry Systems	• Services • Manufacturing • Creative economy • Solidarity economy • Entrepreneurship • Public-Private Partnerships (PPPs) (e.g.: urban infrastructure)
FISCAL INSTRUMENTS AND FINANCIAL MECHANISMS			
• Financial mechanisms aimed at conservation, not limited to carbon • REDD+ projects • Carbon market adjusted to the demands of the Amazon reality	• Payments for Environmental Services (PES) • Tax incentives for the low-impact bioeconomy	• Payments for Environmental Services (PES) (positive externalities) • Sustainable agriculture incentive program (e.g., ABC Program) • Tax and financial incentives with compensation for conservation • Elimination of funding for unsustainable activities which are untracked over time • Blended finance agenda that combines subsidy and assisted credit, aimed at strengthening bioeconomy supply chains	• Tax incentives that link industry and services with conservation activities and distribute benefits to other areas of the Amazon • Incentives for the circular economy (e.g., solid waste) • Urban initiatives inspired by Nature-based Solutions

LAND TENURE REGULARIZATION AND LAND USE PLANNING

• Land Tenure Regularization and Land Use Planning as a State Policy • Land administration with land title regularization of right holders, individual and collective rights and conflict resolution • De-bureaucratization of land title verification process • Continuity of land governance and land title regularization programs and integration of land data among federal and subnational entities • Robust land administration system, integrating public institutions and executing public land policies for land use and environmental conservation • Review of initiatives such as the Terra Legal Program • Guarantee of transparency mechanisms in the process of allocation of public lands • National Traceability Program, with full disclosure of information (GTAs, DOFs, management authorizations, prospecting, SIGEF certification, etc.) • Cancellation of irregular registrations in the CAR, especially those overlapping conservation units and indigenous lands

- Strengthening and effective application of command-and-control actions to fight land grabbing and deforestation
- Public land management plan, with territorial diagnosis of areas with land title vulnerability
- Public concessions for economic use of Conservation Units
- Collection of public lands and registration in the land administration system
- Destination of public forests
- Consolidation and expansion of Conservation Units and Indigenous Lands
- Recognition of collective rights of indigenous peoples and other traditional communities
- Full compliance with the Forest Code
- Encouraging the participation of the private sector and diagnosis of production chains
- Review of Amazon Master Plans
- Urban land title regularization
- Incentives for the reoccupation and restoration of real estate properties that are vacant/deteriorated to achieve the goals of compact and connected cities

SCIENCE, TECHNOLOGY AND INNOVATION

• Creation of a National STI Program focused on the Amazon biome • Greater integration of traditional populations and their knowledge into universities and the research environment • Appreciation of indigenous researchers, continuing the project for the first Indigenous University in Brazil • Pedagogical pathways aimed at connecting Amazonian youth with regional realities (e.g. forest conservation, bioeconomy) • Strengthening the teaching of grassroots entrepreneurship, with practice-oriented learning • Production of knowledge that promotes social inclusion and income generation, in addition to being compatible with forest conservation • Basic conditions for scientific research, such as security and infrastructure • Creation of a supranational Amazon fund focused on STI and high-level research • Financing models for RDI considering non-reimbursable funds • Technologies and methodologies for carbon measurement in activities related to land use and biodiversity monitoring • Fostering innovation in the private sector, with increased investment in applied research • Support for innovation by companies established in Brazil and the Amazon, focusing on new products, processes and functionalities • Incorporation of new technologies in the industry aligned with the decarbonization trend and the appreciation of inputs from the Amazon biome • Incentive to innovation ecosystems, with investment in technology-based startups and education for entrepreneurship • Organization of existing knowledge about the Amazon and dissemination of technology • Strategy guided by missions and elaborated with broad social participation, recognizing the particularities of the region • Review and reformulation of the legal framework for the Amazon, with incentives for science and technology and collaboration mechanisms between universities and the private sector • Plan for strengthening institutions in the Amazon • Innovative arrangements to promote greater collaboration between public research institutions and non-governmental players • Transdisciplinary initiative that brings together various types of Amazonian knowledge, based on priority themes such as bioeconomy

- Support for protected areas to become fundamental to the development of research in the conservation of the biome, for bioprospecting, bioeconomy and biotechnology
- Deepening knowledge of nature and local cultures
- Social technologies
- Inclusion of local populations, especially youth
- Native forestry
- Sustainable land management
- Science applied to low-impact bioeconomy
- Strengthening traceability systems (blockchain, remote sensing, etc.)
- Development of technology that is more suitable for commodity – forest integration
- Food systems compatible with the maintenance of biodiversity
- Creation of technology parks focused on the biodiversity economy
- Appreciation of traditional knowledge and its integration with production chains
- Attention to solid waste solutions, circular economy, creative economy, energy
- Representation of local researchers
- Decentralized expansion of research and innovation centers
- Creation of technology parks focused on the biodiversity economy




CONSERVED AREAS	TRANSITION AREAS	CONVERTED AREAS	CITIES

INFRASTRUCTURE

• Infrastructure geared towards care, culture and well-being • Public investments in social infrastructure • Planning and implementing infrastructure policies with a local perspective, integrated with other ministries • Reassessing and revamping the General Licensing Law and regulation of the infrastructure policy • Formulation of the concept of green/sustainable infrastructure for the Amazon context • Integration of energy generation systems • Initiatives for adaptation to climate change

- Effective basic logistics for accessing remote locations
- Circulation/flow of biodiversity products
- Green, low impact infrastructure
- Clean logistics (ports, rivers, roads)
- Urban infrastructure planning suited to a harmonious relationship among cities, rivers and forests, especially regarding basic sanitation solutions
- Active participation of local populations in developing solutions for construction works, housing and sanitation
- Restoration of the Popular Housing Policy

INDIGENOUS ISSUES

• Demarcation of Indigenous Lands and securing land rights • Fostering integrated, participative and collective land management to reflect the interests of the indigenous peoples themselves • Fostering development and enforcement of autonomous land management plans as a public policy • Promoting intercultural dialogue and interdisciplinary science to ensure equality of knowledge systems • Empowering female indigenous leaders • Supporting initiatives by indigenous peoples and their organizations that combine sustainable income generation activities with preservation of a standing forest, with full respect for their uses, customs and traditions • Efforts to protect genetic resources and traditional knowledge related to indigenous peoples • Developing indigenous science programs, aiming to foster education of indigenous youth in fields that are key for the protection of their lands: biology, forests, climate change, waters and soil • Improving digital access programs targeted at indigenous peoples in their lands • Securing budget funds that ensure full implementation of evictions from Indigenous Lands • Introducing innovative financial mechanisms designed to support projects for the future of indigenous peoples, through the National Development Bank (BNDES), the Bank of the Amazon (BASA), *Caixa Econômica Federal* [Federal Savings Bank], and private banks, with the provision of guarantees by the Brazilian National Treasury or through a Credit Guarantee Fund (FGC)

- Full protection of Indigenous Lands (TI) and their sociobiological diversity
- Removal of invaders that threaten Indigenous Lands in the expanding areas of economic borders
- Recovery of Indigenous Land ecosystems that have been modified or invaded
- Protection programs aiming at indigenous people living in Amazon cities, with a focus on income generation and guarantee of rights

MINING

• Inspection and control in the fight against illegal mining activities • Joint action with the financial market (bonds and securities brokers - DTVMs and the Central Bank) and with the international community to combat the illegal gold trade • Articulation of organized civil society with local politicians and productive sectors as well as with the National Congress to combat illegal activities • Distinction between illegal (predatory) and legal (that promote development) activities, strengthening the reputation of business activities aligned with the ESG agenda • Establishment of ESG metrics for the mining sector • Restructuring the National Mining Agency • Introducing measures for social support and developing economic alternatives to absorb the labor force and prevent the recurrence of illegal mining

Structuring fronts

EDUCATION

• Designing public policies based on a sense of community and for a socioenvironmental context • Including traditional knowledge systems in education and in the assessment metrics • Valuing education as an option to illegal and predatory activities • Providing connectivity with high quality Internet, intensified use, and equipment • Improving school infrastructure, particularly in indigenous facilities and in rural areas • Expanded availability of technical and vocational education• Effective implementation of the Youth and Adult Education (EJA) guidelines • Implementation of the Pedagogy of Alternation *(Pedagogia de Alternância)* (enhanced interaction between school and everyday life of students in their lands) • Developing an Amazon curriculum for bioeconomy • Revising the Brazilian National Common Curricular Base, adjusting it on the Amazon reality

HEALTH

• Recognition of the socioeconomic and cultural particularities of territories and sub-regions • Strengthening primary care to ensure access to health in remote areas • Review of the normative design of the SUS in its governance and performance models, with instruments suited to the particularities of the Amazon • Attention to invisible groups, such as LGBTQIAP youth, women and young black people from the low-income city outskirts • Recognition and appreciation of the knowledge of the populations that live in the forests about medicinal plants • Provision and retention of health professionals in the Amazon region • Communication between medical students and traditional forest communities with notorious knowledge in the use of natural medicine • Organization and improvement of analytical capacity regarding data about health in the region • Implementation of initiatives focused on telemedicine • Connection between the concepts of human and planetary health (and nexus between investment in health and forest conservation) • Mental health policy for the Amazon

PUBLIC SECURITY

• Understanding the complexity of public security in the Amazon (different types of crimes, ordinary and environmental) • Incentives for those who work in environmental conservation and protection of people • Leading role of indigenous peoples, *quilombolas* and other traditional populations in public environmental management • Fighting predatory economic activities (e.g. illegal mining) • Communication strategy and strengthening of Amazon data collection on security • Integration between the Unified Public Security System (Susp) and the National Environmental System (Sisnama) • Logistics structure for the operations of environmental agencies in the Amazon • Titling environmental services to represent the contribution of indigenous, riverine and other traditional peoples to environmental preservation • Classification of the crime of public land grabbing • Interruption of the flow of money that finances violations • Cancellation of CAR registrations conflicting with and overlapping protected areas • Training of civil servants, including judges, the police, prosecutors, attorneys, and customs officials, in fighting environmental crimes and related violations • Institutionalization of work flows and protocols between the Federal Police and Ibama, with the purpose of investigating large organizations involved in environmental crime and drug trafficking • Combining governance with strategic planning, intertwining policies among federal and state entities to conceive an agenda that is not exclusive to the police • Expansion of coverage and improvement of the quality of records on criminal occurrences and violence, including environmental crimes, for all regions of the Legal Amazon • Computerization of Military Police stations and posts in the Legal Amazon and expansion of electronic registration via the Internet • Permanent audits in the CAR and integration with other inspection, monitoring and traceability systems, to expand control of production chains and prevent fraud • Prioritizing the Tactical Operational Program in Public Security within the scope of the Interstate Consortium for Sustainable Development of the Legal Amazon

FOOD AND NUTRICION SECURITY

• Increasing the resilience of agriculture to climate change • Nature-based Solutions (NbS) • Strengthening the National Food and Nutrition Policy • Flexibilization of Pronaf criteria • Resumption of the original design of the Food Acquisition Program • Prioritization of traditional populations and indigenous peoples in the National School Food Program • Research and development of alternative proteins with less environmental impact • Resuming and reviewing public procurement policies prioritizing small farmers and traditional communities • Access to credit, market and technology for family-based, agroecological and low-carbon agriculture • Guaranteed transportation of family and agroecological products • Strengthening short production chains (direct producer-to-consumer sales) in food systems to ensure financial autonomy, especially for women

CONECTIVITY

• Access to basic rights • Access to health (telemedicine) • Access to education (access to knowledge and distance learning) • Strengthening territorial protection and cultural ties • Expanding job opportunities and entrepreneurship

Cross-sectional fronts

GOVERNANCE

• Adjusting the dysfunctional balance among federal, state and municipal powers • Strengthening local and subnational institutional capacities • Further expansion of the participation of civil society and the business sector in public governance contexts • Institutional empowering of the Superintendency for the Development of Amazonia (SUDAM) • Articulation of organizations in a supranational level • Collaboration among Amazon countries through the Leticia Pact and ACTO • Improved governance of income transfer mechanisms (e.g.: ZFM, FPE and FPM)

CULTURE

• Valuing and disseminating the sociocultural wealth of the Amazonias and building a collective imaginary that values landscapes and local identities.

FIGHT AGAINST DEFORESTATION

• Concomitantly strengthening the four axes of the Action Plan for the Prevention and Control of Deforestation in the Legal Amazon (PPCDAm): 1. Sustainable production activities; 2. Environmental control and monitoring; 3. Territorial and land use planning; and 4 Normative and Economic instruments

CLIMATE CHANGE

• Strengthening and integrating mitigation and adaptation strategies

Economy

- The Amazon needs capital in the broadest sense of the word. Technical assistance must come early on in order to build firm foundations to attract resilient, impactful and green capital.

- Bioeconomy is not a silver bullet, but it must be contemplated in all possible ways, so that a set of integrated initiatives for the different Amazônias is formed.

- Cities must be regarded as vectors of creativity and change, projecting culture to another level.

Although a perception of scarcity prevails in the Amazon – lack of credit, infrastructure and skilled labor, among other factors – the region has an abundant, invaluable, and socially diverse wealth of people. In addition, it is rich in natural resources and has a vast amount of underutilized land that could create wealth. Of the 70 million hectares of pasture, 25 million are degraded areas. The term “scarcity”, therefore, does not capture the economic reality of the Amazon.

Some of these problems are associated with waste and lack of coordination, in a scenario aggravated by inequalities. These inequalities are both internal (for example, 80% of rural jobs are informal, against 60% in cities) and in relation to the rest of the country, which explains the region’s current poor socioeconomic indicators. Behind these difficulties is Brazil’s servile view of the Amazon. The region usually exports primary products and consumes more complex goods and services, in a dynamic that deepens inter-regional inequalities (WRI BRASIL, 2023).

The Amazon, however, must be recognized as a catalyst region for the low-carbon economy. And that could create opportunities, generate income and secure employment, in addition to valuing local cultures.

Solutions range from what not to do or what to prevent, such as illegal mining and speculative cattle ranching, to developing a green and inclusive economic base. One that would also be

less dependent on the significant amount of resources received via state and municipal participation funds (FPE and FPM) and income transfer mechanisms.

Without neglecting the income generated by conventional activities, such as mining, livestock farming and agriculture, public and private investments should strengthen the local economy, with emphasis on the creation and permanence of wealth in the territory (WRI BRASIL, 2023). The Amazon economy, therefore, needs investment in the broadest sense of the word, with the greatest possible mobilization of patient capital in the short term, bringing with it technical assistance, so as to build firm bases for its constitution.

There is no "silver bullet" to encourage economic development in the Amazon, but rather a set of initiatives that supplement each other throughout the Four Amazônias. In the conserved Amazon, Brazil must think beyond the economy of protected areas: it also needs to allocate public lands and resume the creation of conservation units (UCs), with ensuing economic activities and job creation.

Expressions such as socio-bioeconomy and socio-biodiversity economics designate the wide variety of activities compatible with forest conservation. And, above all, these are activities that provide for the social and productive inclusion of indigenous peoples, traditional communities, and family farmers, besides involving guarantee of the rights of these peoples to land (COSTA *et al*, 2022; OBSERVATÓRIO DA ECONOMIA DA SOCIOBIODIVERSIDADE [Socio-biodiversity economy observatory], 2022).

Considerable knowledge has already been built up regarding various value chains with export potential (COSLOVSKY, 2021), solutions related to pre-competitive arrangements or sectoral shared resources (ReCS), innovative production techniques, certification protocols, and trade promotion.

In view of this, governments can play a relevant role, for instance implementing policies aimed at the bioeconomy and stimulating markets in the region, with the creation of seals of approval and the organization of systems of designation of origin. In the field of technical assistance, some proposals to foster a socio-bioeconomy involve the creation of an "Embrapa for Biodiversity", with the production of knowledge focused on conservation.

When economic activities involve access to genetic heritage and the related traditional knowledge, it is essential to improve benefit sharing mechanisms in order to ensure greater equity in negotiations. The current legislation establishes that sharing applies only to the final product, and not to intermediate inputs, which are generally those produced by traditional communities. Thus, these materials leave the region in their raw state to be processed in other regions of the country, without adding value in the Amazon.

Investments in sustainable forest management must promote the forestry of native species on a scale comparable to that of agro-industrial sectors in the country. And, in this way, stimulate the tropical wood market and also contribute to the recovery of degraded areas (SOARES, *et al*, 2021).

In areas of the transition Amazon, which are under intense pressure from land grabbing and other activities that result in deforestation, the restoration of degraded areas could be done for ecological or productive purposes. In both cases, there is a market for inputs and services that would create jobs and generate income for traditional peoples and communities, family producers, and young workers (PINTO *et al*, 2021).

Investing in restoration with native species is a priority for reversing losses from deforestation. Increased economic attractiveness of restoration requires reinforcing the positive aspects of this agenda, giving visibility to opportunities for environmental, economic and social gains. Currently, there are about 15 million hectares that are not being used and, therefore, available for restoration in the Legal Amazon (VERÍSSIMO, ASSUNÇÃO E BARRETO, 2022).

In converted areas, that is, areas already deforested for agriculture or other activities, it is a basic condition to reorienting strategies, policies and incentive instruments that favor a carbon-intensive economy to favor a fair economic transition for local peoples (WRI BRASIL, 2023) (see the Food and Nutrition Security section, on page 56).

To ensure the position of Brazilian agriculture as one of the most competitive in the world, it will be vital to accelerate the transition to low greenhouse gas emission models. And also establish control over the use of agrochemicals so as to comply with international standards. This transformation needs to be attuned both to trends in demand for healthier food – which contribute to the regeneration of ecosystems – and to the future of the Brazilian industrial park. That is, it must be aligned with opportunities to add value to the biomass in the fields of bioenergy and biochemistry (DERRUBANDO MUROS, 2022).

But it is in cities that essential sectors that promote economic dynamism in the region are found, such as services and manufacturing. This requires the formulation of programs aimed at increasing productivity in these sectors. It is in the urban Amazon that more than 70% of the population of the Legal Amazon live. The 2022 Census shows Manaus as the city that gained the most inhabitants in absolute numbers (261.5 thousand), along with seven other forest cities that recorded strong expansion.

In order to take advantage of the demographic bonus that, according to some authors, should extend until 2030, vocational education programs aimed at young people are essential, since this subgroup faces difficulties in entering the formal job market.

To attract and retain good professionals in the region, creating job opportunities and improving infrastructure and leisure options in cities is essential. This necessarily involves the availability of high-speed internet infrastructure to improve basic services, such as education and health. And it also involves better opportunities for local workers and entrepreneurs (VERÍSSIMO, ASSUNÇÃO E BARRETO, 2022) (see the Connectivity section, on page 58).

Although not restricted to the urban Amazon, the creative economy has great potential for providing formal jobs, especially for a portion of the population with low education levels, and thus not qualified for the industrial sector. Manaus, for example, sees positive results from the Amazonas Opera Festival, which has been taking place for over 20 years and gives visibility to Teatro Amazonas. The event promotes a variety of services associated with tourism, transport, gastronomy and commerce in its surroundings.

Fiscal instruments and financial mechanisms

- In many cases, the economic viability of sustainable projects is only achieved with tax incentives, subsidies or monetization of the environmental services they provide.
- It becomes necessary to review existing incentive structures and improve their governance.
- Financing and lines of credit for the recovery of degraded pastures and restoration of landscapes should be increased.

The analysis of revenues and expenses of the states of the Legal Amazon reveals that local governments have little margin to carry out investments in logistics and social infrastructure, environmental management and science and technology. This prompts a reflection on how to finance the transition and sheds light on the role of private resources as well as trends in the financial sector, private investment and philanthropy. A blended finance agenda, for example, could strengthen bioeconomy chains. In many cases, the economic viability of sustainable projects is only achieved with tax incentives, subsidies or monetization of the environmental services they provide. In this sense, fiscal policy plays a fundamental role in guiding the desired transition, through compensations linked to the conservation of ecosystems.

The consideration of negative externalities – such as taxation of pollutants – may also affect this equation. In view of this, it is important to revise the way conventional activities are implemented, review existing incentive structures and improve their governance, in order to obtain sustainable economic growth.

Environmental services provided by the forest benefit people and productive sectors in different regions of the continent and the world. The discussion on payments for environmental services (PES) must therefore be conducted in a comprehensive manner, aiming to generate income for the Amazon as a whole. To that end, it is fundamental to deepen our understanding about hydrological cycles and carbon absorption capacity, among others, so that the possible remuneration of activities that strengthen these environmental services is well grounded.

The Brazilian Coalition on Climate, Forests and Agriculture makes recommendations to regulate Law 14.119/21, which institutes the National Payment Policy for Environmental Services, including its financing. The Coalition suggests potential sources of funds, such as transactions involving environmental assets in regulated and voluntary markets; public, private or multilateral sources; payments of environmental compensations, among others.

In the so-called conserved Amazon, it is possible to generate income from payment systems that remunerate conservation activities, such as the mechanism for reducing emissions from deforestation and forest degradation (REDD+). This instrument considers the conservation of forest carbon stocks, the sustainable management of forests, and the increase in forest carbon stocks.

In converted areas, on the other hand, it is important to increase financing lines for the recovery of degraded pastures, set forth in the Programa ABC (Low-carbon Agriculture Program), as well as for the restoration of landscapes proposed by Planaveg (OC, 2022). And also watch the role of PES in the restoration economy.

In family farming and in all agribusiness, the guideline is to increase productivity with sustainability. Instruments for the transition to low-carbon agriculture include linking credit lines to com-

mitments and targets for reducing emissions on rural properties. This is especially important within the scope of the Crop Plan, with the expansion of the Sectorial Plan for Adaptation and Low Carbon Emissions in Agriculture and Livestock Farming. Such expansion must be accompanied by a broad and revamped supply of technical assistance and rural extension (Ater) and management (Ateg) to producers and cattle ranchers, particularly those in family farming.

Fostering sustainable production activities is associated with the inclusion of circular economy and digital economy elements. And also with the guarantee of greater security and transparency in the commodity production chains. The integration of inspection, monitoring and traceability systems, in addition to full disclosure of data, will enable greater social control of those chains (OC, 2022).

Another important measure is to restrain extensive livestock farming that deforests, degrades, and repeats this cycle. In addition to traceability, there are proposals such as linking the granting of public rural credit to increased productivity (BRITO E GOMES, 2022). Similarly, land speculation can be discouraged with the use of taxes, such as the Rural Real Estate Tax (ITR) (IMAZON, 2022).

Therefore, it is essential to discuss shifts in subsidies that currently fund low-productivity activities and that exert pressure on deforestation. These activities need to be in line with sustainability and value-added criteria. Based on these analyses, the purpose would be to formulate targeted policies and incentives.

The Manaus Free Trade Zone (ZFM) is a model with the potential to strengthen the local economy with emphasis on the generation and permanence of wealth in the territory. A good example is the Bioeconomy Priority Program (PPBio), which raises funds from mandatory investments in RD (Information Technology Law) to develop new products, services and businesses associated with the bioeconomy (IDESAM, 2022).

If the interest of companies already installed in Manaus in promoting a sustainable relationship with the forest is proven, incentives must be aligned with this objective. The Basic Production Process (PPB), for instance, needs to incorporate environmental criteria and other incentives to take advantage of local diversity (SCHUTZE, HOLZ E ASSUNÇÃO, 2021).

Still in cities, it is advisable to adopt tax incentives for the circular economy, involving urban initiatives inspired by nature-based solutions. And also for industry and services to be linked to conservation activities and distribute benefits to other areas of the Amazon.

Land tenure regularization and land use planning

- Land tenure regularization and land use planning are complex guidelines, which do not advance due to the ineffectiveness of the State, which limits the enforcement of existing laws.

- It is essential to turn land use planning and land tenure regularization into a State policy, with a robust system of land management and well-structured planning, with transparency and effective social participation.

The occupation of land in Brazil has been disorganized since before the enactment of the Land Law in 1850. This occurred due to the inability of the State to implement an effective registry – integrated with a system of public records – to overcome the land title chaos. In the Amazon, the debate on land title regularization usually draws attention within the scope of proposition of laws – a scenario that involves the use of stratagems to avoid setbacks and keep rules flexible that perpetuate incentives for land grabbing.

A study of the Amazônia 2030 project (BRITO E GOMES, 2022) points out that conducting land use planning in the Amazon – in addition to eliminating deforestation – is a necessary condition for the region to be able to reconcile quality of life and environmental conservation. Without resolving land title and land use issues, it will neither be possible to increase agricultural productivity, thus eliminating deforestation, nor to attract good investors and entrepreneurs. In addition, it will not be possible to take advantage of opportunities related to the bioeconomy and forest restoration, nor to guarantee the provision and remuneration of ecosystem services provided by the forest.

In the Amazon, 143.6 million hectares of public land – almost one third of the region – do not have a destination in terms of purposes and uses. As a result, these areas are prone to land grabbing. The basis for defining the use of these lands is already laid down in current Brazilian legislation. It is, therefore, fundamental

to have a policy that aligns the procedures for the allocation of public lands with the priorities identified based on the interpretation of the Constitution and national legislation.

Decision-making procedures on the destination of public lands have not ensured that legal priorities are met, thus putting forests at risk. Since 2009, federal legislation expressly prohibits the issuance of land titles and the granting of real right of use for land regularization in public forests.

Decisions on what to do with federal lands goes through the Technical Destination Chamber (CTD), composed of several federal agencies. To ensure that these areas are allocated in a way that is compatible with their conservation, sustainable use and reduction of deforestation, the CTD's operating rules must be improved and decisions that violate the legislation must be revoked. Among corrective measures is the proposal to revoke requests for land title regularization for areas that overlap public forests. Currently, land grabbers use the Rural Environmental Registry (CAR) to prove ownership of land in public forest areas. The area corresponding to these illegal declarations reached 16 million hectares in 2020.

On the one hand, it is vital to reduce bureaucracy in the regularization for those who are deprived of rights. And, above all, to overcome the impasses reached due to the informality of land use and occupation, such as conflicts in the countryside, hindrances in accessing capital goods and markets, and lack of funding for land and agricultural products. It is estimated that 40 to 50% of the legitimate documents that could have been transformed into titles in the Amazon were not. In addition, the perpetuation of land grabbing often occurs to the detriment of the rights of indigenous peoples and *quilombolas*, who are awaiting the demarcation and recognition of their territories.

The proposal for land regulation is not tackling the problem of small and medium landowners, it is instead seeking to expand the parameters so that larger areas might be regularized. Land grabbing must be understood as a corruption process that produces extremely negative social and environmental impacts. In addition, it is a violation of public property and a tax evasion crime.

After much reflection, the Work Group on Land Tenure Regularization and Land Use Planning (OTRF WG) of the Concertation concluded that the policies have not advanced due to the absence of a set of structuring initiatives, which hinders the enforcement of current laws. The two main questions are: What uses do we want for the territory, as set forth in the Constitution? And what is the desirable degree of control to be exercised by the State and by society?

Today, information on land possession and ownership is fragmented and dissonant. It is essential to integrate the registries linked to land governance in the country, as well as to ensure social participation and transparency in decisions regarding land allocation and regularization.

Science, Technology and Innovation

- The recovery of teaching and research institutions in the region is a priority, starting with the reorganization of the staff of researchers and employees. Financing models for STI must consider that non-reimbursable resources are still extremely important.

- Without biome conservation, proposals for bioprospecting and biotechnology will not have room for development. The absence of fundamental elements, such as security and infrastructure, prevents the progress of research.

- Innovative arrangements for public research institutions are needed to promote greater collaboration with non-governmental players.

From monitoring environmental impacts to prospecting for biodiversity and innovations for the bioeconomy - along with improving quality of life -, science, technology and innovation (STI) is strategic for the future of the largest tropical forest on the planet. The issue became even more challenging after the first report by the Science Panel for the Amazon, released in 2021, with the warning that the Amazon Rainforest is reaching a point of no return that will entail global impacts and threaten conservation and sustainable development of the region.

In addition to investments in forest restoration and demarcation of indigenous lands, the complexity of solutions requires a new level of knowledge generation to face these challenges. A multi-institutional effort is needed, and it must combine traditional knowledge with academic knowledge, in addition to involving the public and private sectors to provide inputs in the formulation of public policies. In the climate emergency, financial contributions to scientific research must be proportionate to the size of the risks to agriculture, to water supply in urban regions, to health and to the protection of biodiversity.

Since 2013, budgets for STI have been reduced. In the Amazon, the situation is even more alarming: the region represents 60% in terms of surface area and accounts for almost 10% of the GDP, but receives less than 1% of national expenditure on science, according to data from the Legal Amazon Observatory.

Adding to the absence of labor rights, among other factors, this situation explains the evasion of highly qualified human resources to other sectors or countries. In addition, the STI agenda suffers from the little involvement of the private sector, which makes meager investments in applied science, in contrast with that of developed countries. The business world is fundamental for the bioeconomy not to be seen with a bias of primary extractivism, but for it to take a leap forward and undergo a profound transformation within 10 to 15 years.

In parallel, institutional models are inadequate for collaboration with non-governmental players. There is a lack of teaching on basic entrepreneurship, with practical learning – and this is where the interaction with the private sector could make a difference. Current programs aimed at creating startups also lack territoriality, as they do not always consider the specific needs of the region.

There is also a lack of basic conditions, such as security and infrastructure, especially in the most isolated regions, where violence has made it difficult to carry out field research. This scenario makes it difficult to integrate traditional populations and their knowledge – indigenous, *quilombola*, riverine people – into universities and the research environment. As a reflection of this, there is insufficient effort to monitor species and diagnose the situation of ecosystems in the long term, so as to set boundaries and conditions for exploration. This problem also affects the experiments about the effects of climate change, which are still limited in the country, despite the planetary importance of the Amazon.

Brazil has an enormous capacity to be a rising power among the new economies that are guided by the goals of climate protection and biodiversity, but its advance depends on investments in STI. The productive and financial sectors, civil society organizations, philanthropic institutions, traditional communities and international cooperation, among others, have roles to play for a strategic agenda in this direction. Along with them, the Federal Government has the ability to direct efforts and coordinate them with other policies. The development of STI systems is related to other social, political and economic challenges, such as ensuring compliance with laws, education, public security and the environment. Furthermore, without conservation of the biome, proposals for bioprospecting and biotechnology will not have room for development.

In this scenario, the network articulation of the Amazon Concertation has favored reflections around propositions such as the creation of a National STI Program focused on the Amazon biome. A greater integration of traditional populations and their knowledge into universities and the research environment is key, with appreciation of indigenous researchers and learning resources geared to connecting Amazon youth with regional demands.

In summary, the strategy must be based on the production of knowledge that promotes social inclusion and income gener-

ation, in addition to being compatible with forest conservation. To reach this standard in science and technology, new financial instruments are needed, such as the creation of a supranational Amazon fund focused on STI and high-level research. Financing models that take into account non-reimbursable resources remain essential for emerging innovations on different topics.

The demand for technologies and methodologies to measure carbon emissions and reserves in activities related to land use and biodiversity monitoring is growing. This context requires support to innovation by companies established in Brazil and in the Amazon, with a focus on new products, processes and functionalities. Encouraging innovation ecosystems, with investment in technology-based startups and education for entrepreneurship, is a strategy that is growing stronger in the region. There is, however, the challenge of moving forward with the legal framework for incentives to science and technology in the Amazon, with a plan to strengthen institutions and innovative collaboration arrangements.

Infrastructure

- Allocating funds to infrastructure projects does not necessarily result in local socioeconomic development. This sector must have a view to care, culture and well-being.

- Decision-making processes require integrity procedures based on technical criteria in order to break the agenda's historical relationship with corruption.

- It is vital to study infrastructure policies with an integrated approach, including other ministries and regional stakeholders. The Amazon is itself an infrastructure that offers solutions to Brazil and to the world, and plans must be in place for climate change adaptation initiatives.

Discussing infrastructure means also discussing development models. The current infrastructure, for instance, is the response to a model mostly based on the flow of commodities. And instruments such as the 2035 National Logistics Plan (PNL) reflect exactly this, they do not contemplate projects geared towards conservation economics. These projects are "territorially blind" and "socially deaf": they have scarce social participation, and are limited to environmental licensing processes. There is a lack of prior listening to the affected populations on what they understand and desire in terms of development.

A critical element is the need to underline Amazonian perspectives when thinking about the future. The current picture shows that, throughout history, financial support to infrastructure projects does not necessarily mean local socioeconomic development for the Amazon.

According to data from the Institute for Energy and the Environment (IEMA), the Amazon exports energy to the rest of the country, whereas almost 1 million people living in the region do not have steady access to electricity. Another 3 million rely on diesel-fueled thermoelectric plants that are isolated from the national integrated system. At the same time, the construction of dams and roads and the exploitation of oil and gas entail multiple social and environmental impacts: hydroelectric power plants, for example, lead to the need for opening roads which, in turn, lead to increased deforestation and degradation. The synergistic effects of these impacts may compromise the functioning of ecosystems, with important consequences on lifestyles and on human health.

Proposed changes to the model should start by making people visible from a physical and geographic point of view. The territoriality of infrastructure projects in the Amazon is greater than previously imagined and far more difficult to tackle through legislation. The area of influence of construction works needs to include changes triggered by the implementation of those projects. The challenge is not limited to licensing processes, which of course need to be improved. Anticipatory measures to prevent negative impacts are needed, in addition to strengthening territorial governance and ensuring social participation, as well as transparency and monitoring so as to build trust among the various parties.

The demand for infrastructure in the Amazon goes beyond the basic apparatus of social and economic life, such as water, sanitation, energy, internet access and mobility. Transcending the fight against poverty and hunger, there is an immaterial dimension that includes social cooperation, institutional capacities, knowledge, technology, education revolution, and even combating environmental crimes.

Changing regulations and inviting society to get involved in

the decision-making process is not enough. Public environmental management must also be rearranged. Among other factors, infrastructure must be seen as a solution to achieve the goals of the Paris Agreement and the Sustainable Development Goals (SDGs). It must be in step with a new model of economic development that combats deforestation, inequalities and violence, one that contributes to keeping the forest standing and protects its watercourses.

Besides licensing, there are ongoing discussions such as the energy transition in the Amazon, which needs large-scale public policy. Given the challenge of decarbonization, energy planning in the region must focus on reducing dependence on fossil fuels – yet with the awareness that, without access to energy, there is no way to develop the bioeconomy or expand access to health.

Indigenous Issues[1]

- Although the Brazilian Constitution acknowledges the right of indigenous peoples to their lands, political and economic interests prevent its full consolidation.
- The relevance of indigenous peoples and traditional communities is directly correlated with curbing deforestation, conserving biodiversity, regional and global climate regulation, and with maintaining their cultural heritage.
- No activity conducted without deliberation and guidance by indigenous peoples will be beneficial to their territories.

Although the Brazilian Constitution acknowledges the right of indigenous peoples to their lands, political and economic interests prevent its full consolidation. The native peoples and *quilombola* people, extractivist and riverine communities face a scenario of constant fight for self-determination and autonomy over their territories. Indigenous and traditional peoples living in the Amazon are threatened by advances in agro-extractivism. Such threat translates into increased land invasion and grabbing, expansion of agribusiness, prospecting and exploitation of mineral resources and installation of large infrastructure works.

Under a Eurocentric and colonial view, a notion that the Amazon is only (economically) valuable if exploited according to the capitalistic logic still prevails. But for indigenous and traditional peoples, their territories are a key component of their world views, which are based on identities built historically from ancestral knowledge.

In the Brazilian Amazon, protected natural areas and indigenous lands occupy 42.2% of the biome. They are home to 190 indigenous peoples – including 54 isolated groups –, amounting to 752,421 individuals, the greatest diversity and the largest population in the entire Pan-Amazon region (RAISG, 2020).

These groups are relevant for curbing deforestation, preserving biodiversity and regulating both the regional and the global climate. These native peoples and traditional communities are even more relevant as their lifestyles and land use management approaches strengthen and preserve a valuable local cultural heritage. However, during the formation of the Brazilian State, both indigenous peoples and traditional communities had little or no voice in conceiving and implementing public policies aimed at them. The State apparatus has promoted homogenous ethnic and racial groups. A new approach to the Amazon development has to consider that no economic activity conducted without the active voice and participation of these people will benefit their territories.

Initiatives in this direction start with demarcating indigenous lands and securing them the right to their territories. They must include integrated, participative and collective territorial management, a type of management that reflects the indigenous peoples' own interests. They must involve intercultural dialogue and interdisciplinary science, thereby ensuring equal knowledge. And they also require empowerment of female indigenous leaders.

It is equally necessary to support the initiatives of indigenous peoples and their organizations, which combine sustainable income generation activities with forest preservation. Such support has to be materialized through digital access, use of innovative financial mechanisms, and deep respect for their culture, customs and traditions.

In the Amazon transition areas, facing pressure from the economic border expansion, it is imperative to expel invaders that threaten the integrity of indigenous lands. As for the converted territories, those ecosystems within indigenous lands that have been modified or invaded must be recovered. In the Urban Amazon, programs aimed to protect the indigenous peoples living in urban areas, especially those intended for income generation and the guarantee of rights, must be put into practice.

Mining

- Along with the fight against illegal mining, a strategic agenda for mining activities must be put into practice.
- The removal of occupants from mining areas needs to be coupled with support measures and economic alternatives.
- It is important to enhance dialogue with organized civil society, with the financial and production sectors, with governors, the National Congress, and the international community.

With regard to mining in the Legal Amazon, it is useful to distinguish two fronts that run in parallel. The first is the fight against illegal operations in all types of mining activities. The second is establishing a strategic agenda for mining in the region, in compliance with ESG (environmental, social and governance) criteria and with national interests. Any predatory mining activity, regardless of the scale, is a threat not only to civil society, but also to private business, because it affects the reputation of the sector as a whole.

Between 1985 and 2020, the area occupied by mining in the country increased sixfold, jumping from 31,000 to 206,000 hectares. Much of that increase took place in the Amazon Forest, where 72.5% - nearly 150,000 hectares - of mining areas were located in 2020. Small-scale mining, specifically, is almost entirely concentrated in the Amazon and has dramatically expanded in recent years, occupying an area larger than that of industrial mining. In addition, small-scale mining has advanced over indigenous lands (TI) and conservation units (UC) in the Amazon. Between 2010 and 2020, the area occupied by small-scale mining within indigenous lands increased by 495%, and in the conservation units that growth reached 301% (MAPBIOMAS, 2022).

On the front of enforcement against illegal mining, the role of government bodies, such as the Central Bank, is key. The Central Bank should duly fulfill its role in the inspection and control over the production and trade of gold in the country. For the implementation of a socio-environmental compliance and traceability system, there are available technologies, such as blockchain and molecular marking with silver isotopes (INSTITUTO ESCOLHAS, 2022). In addition, the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA) should prepare reports on the import and sale of mercury, used in gold extraction, in order to tighten control and increase transparency in the value chain (OC, 2022).

Nevertheless, simply curbing illegal activities is not enough. In some cases, small-scale mining is the only livelihood option for countless families. In order to be effective and long-lasting, the removal of miners from invaded areas must be planned so as to accommodate this workforce, with emergency financial assistance and income and employment alternatives.

On the industrial mining front, there is a strategic agenda to be drawn up regarding ores that are crucial for energy transition and for the digital economy. This includes the generation of energy from renewable sources and the development of batteries and electric engines. Another strategic theme for the country is reducing dependence on imported fertilizers. Given its rich geodiversity, Brazil can be at the forefront of this technological path, jointly leveraging the mineral and agricultural sectors (FEBRAGEO, 2022).

Brazil is hardly aware of its geological potential, and hence it is crucial to encourage research at scale (IBRAM, 2022). This would facilitate orderly and transparent exploitation of mineral resources, with socio-environmental safeguards and respect for the rights of indigenous peoples and local communities.

Yet, in order to determine these directions, lengthy and open conversations between organized civil society and elected governors, the financial sector, the production sector, the new National Congress and the international community is a must. The regulation of article 231 of the Federal Constitution, which established the main rules for the protection and use of indigenous lands, for example, leaves room for different legal interpretations and impasse. This calls for wide-ranging discussions with society, with indigenous peoples playing a leading role. One suggestion is that public consultations start from a demand from indigenous peoples themselves, in a type of “reverse consultation”, with the support of the Brazilian Geological Survey (FEBRAGEO, 2020).

Education

- The State, public policies and schools must commit to ensuring the right to quality education as an alternative to illegal and predatory activities.

- Traditional knowledge should constitute learning and educational evaluation metrics. No one knowledge is worth more than any other.

- An Amazon curriculum should be devised for the bioeconomy and the National Common Curricular Base should be revised according to local realities.

Most education indicators in the Legal Amazon lag behind those in the rest of Brazil. Data from the Continuous National Household Sample Survey (PNAD), as disclosed by the IBGE, show that the Amazon is still the second worst Brazilian region in terms of illiteracy. The rate of "neither-nor" young people in the region was 21.1%, whereas in the rest of Brazil it was 14.4%, with a downward trend. The Legal Amazon Education report – diagnoses and critical issues – produced within the scope of the Amazônia 2030 project – evidences that higher and upper secondary education are virtually non-existing in the Amazon countryside areas. Additionally, indigenous peoples have no access to higher education.

Quality education and training, however, will be key to creating work and professional development opportunities, by pushing young people and adults away from predatory activities, such as deforestation and illegal mining. The Government, education policies and schools must commit to ensuring the right to quality education and advancement in school. These guarantees should become alternatives to illegal activities, starting with early childhood education, advancing to elementary and secondary school and reaching vocational training and higher education. Families and communities must be engaged in this process.

Rendering such engagement as effective as possible involves a dialogue between education in the Amazon and its local characteristics. Traditional knowledge should be included in the learning processes and assessment metrics, and interactions between students' school life and everyday life should be encouraged in these territories. Moreover, school infrastructure has to be improved, particularly in indigenous and non-urban areas.

The Amazon regions have particularities that are not properly considered in public policy and formal statistics. The concept of "rural", for instance, cannot capture the rich diversity of inhabitants of "non-urban" areas, such as indigenous, *quilombola* and riverine peoples, and also the immigrant and caboclo populations.

One possible path to deal with such reality is the adoption of experiments with the Pedagogy of Alternation (Pedagogia da Alternância), already in use for basic education. It employs instruments to promote interactions between school and everyday life for students living in the various communities. In this context, an Amazon curriculum targeted at the bioeconomy should be considered, and the Brazilian Common National Curriculum Base should be revised based on the Amazon's various realities.

Improving institutional capacities of municipalities is a means to providing better public education services and strengthening bonds between populations and their own realities. At the same time, it is vital to link together global and local realities - which makes digital connectivity so relevant -, ensuring access to quality broadband Internet in education contexts.

Health

- The quality of health in the Amazon is not on par with improvements in other Brazilian regions.
- Strengthening primary health care is key to ensure access to health in remote areas.
- It is essential to acknowledge the social, economic and cultural particularities of the territories and sub-regions.

Health indicators in the Amazon show less quality than those observed in the rest of Brazil. In addition, the region has unique health-related characteristics in different geographic, cultural, social and economic contexts. Life expectancy, an indicator that has an upward trend all over the country, advances at a slower pace in the Amazon when compared to other regions. This is due to the mortality rate among the elderly as a result of diseases such as diabetes and circulatory problems, to mortality among youth and adults as a result of violence or accidents, and to persistently high levels of infant mortality resulting from infectious diseases. Among the indigenous population, indicators are even more alarming: infant mortality rate is 6.5 higher than that observed in the country as a whole.

Health-related challenges affect other agendas, such as basic sanitation, which requires investments in order to reduce waterborne diseases; and that of the economy, as early childhood care reflects on the development of skills and abilities of future adults.

There is also a link between health and the connectivity infrastructure, given the demand for telemedicine in remote areas. Long distances entail costs regarding logistics and stays in cities for free treatment by the SUS health care system. Acknowledging these circumstances underlines the fact that inequality in that region stems from numerous absences that directly or indirectly affect population health.

The Amazônia 2030 project has mapped out the health picture in the region, observing very poor and worrisome indicators. Concurrently, the provision of health care services is quite precarious: the number of community agents is six times less than Brazil's average; the number of cardiologists per capita, just to mention one single specialty, is three times less in the Amazon.

To ensure minimum support to health care agents and other frontline workers, it is crucial to coordinate policies among federative bodies, with the purpose of strengthening local capabilities and planning. In this sector, funding should serve as a tool to foster articulation among municipalities, civil society, riverine communities and indigenous leaders. Bearing in mind that contracting and purchasing is more expensive in the Amazon, and given the lack of financial means of municipalities, diversifying sources of funds is a short-term option to reverse the health picture.

There are numerous stakeholders in Amazon spaces who are not always included in problem-solving discussions, and this is also the case with respect to health issues. It is urgent to bring these people who are still made invisible to the spotlight. They include the LGBTQIAP+ youth, women, and young black people living in the low-income outskirts of cities – and this also highlights the importance of including mental health issues in these debates.

In view of the social, economic and cultural realities of the various Amazônias, a need to revise the SUS normative design regarding its governance and operations arises – which calls for the creation of instruments more suitable to the region's particularities.

In addition to initiatives related to qualified use of data and technologies with a view to disease prevention, the knowledge of forest-dwelling people on medicinal plants must be acknowledged. This type of knowledge could be formally introduced in the curriculum of health-related courses. That would reinforce an important axis in the Science, Technology & Innovation agenda, one that addresses genetic heritage and the associated traditional knowledge (more on STI on page 42).

Public Security

- Public security means dealing with common, environmental, and highly complex crimes in an integrated manner.

- Thinking about security in the Amazon is thinking about protecting people and their territories, especially the most vulnerable, such as indigenous peoples, *quilombolas*, riverine communities and those who live on the outskirts of large cities.

- Security goes beyond the penal and criminal scale and must be understood as a fundamental right. In addition, legal certainty is a key element in making the entire environment favorable to monitoring and control.

The determinants of criminality are associated with both economic and social aspects. Deprivation of opportunities, inequalities and the absence of structuring public policies, which might withdraw groups from certain situations of vulnerability, are some of the factors that lead to a subculture of violence.

In the Amazon, given its particularities, the issue of public security requires a new model of understanding and coping. The current approach is systematically urban and focused on homicide rates. Thus, crimes considered “common” in the region, such as deforestation, land grabbing and timber trafficking, are not perceived by part of the population.

In 2019, four out of the 10 most violent municipalities in Brazil were located in the region. If the Amazon were a country, it would rank 4th in the global homicide ranking based on 2017 data. According to data from 2022, presented by the Brazilian Public Security Forum, the rate of intentional violent deaths (30.9 per 100,000 inhabitants) was 38.6% higher than the national average. However, these numbers derive from the sum of different types of crimes – and deprivations – that occur before a violent death. The absence of a public security agenda that encompasses environmental and social issues is a latent challenge.

It becomes necessary to shed light on “invisible” crimes that affect Amazonians, such as the enticement of young people by criminal factions and sexual crimes involving children and ado-

lescents. Homicides cases in traditional communities, in black populations in the outskirts of cities and among environment defenders are not isolated incidents. Populations residing in more remote locations are targets for intersections between violations and violent criminal groups in the territory.

Public security in the Amazon needs to be understood in all its complexity, because different types of crimes coexist with environmental violations. The coexistence among people, the environment and illegal activities is a challenge for governments. A possible consequence of this overlap is the interpretation that offenses that derive from an environmental crime are second class, with lesser importance. In this sense, it becomes relevant to think about public security in a multidisciplinary and multisectoral way that goes beyond state police forces.

In addition to the titling of environmental services provided by the contribution of indigenous, riverine, and other traditional peoples for environmental preservation, the demands with a view to security include the classification of the crime of public land grabbing and the interruption of the flow of money that finances illegal activities.

The fight against predatory economic activities, such as illegal mining, is an essential element for quality of life, in addition to incentives for those who work in environmental conservation and in the protection of people. The improvement of security indicators can be achieved by granting leading roles to traditional populations in public environmental management.

As connections are established between public security and the environment, we advance in accountability, promotion, traceability and control of economic activities that impact deforestation in the Amazon. Environmental crimes are related to issues such as corruption and money laundering, and thus require intelligence to be investigated and directed to court.

Ensuring public security means also ensuring legal certainty and civil rights. So, this theme expands its scope and connects with other sectors of public management. Bioeconomy businesses in communities, for example, depend on a property title or registration in the Rural Environmental Registry (CAR), in addition to environmental licenses that currently imply long delays, and face other hindrances that open the door for illegal activities. To weave public policies together, it is key to revive the notion of territory and use the territorial base to redesign governance, thinking in an inter-federative and inter-branch way.

The Amazon factor imposes new governance arrangements for public security. Biodiversity, together with the different forms of land occupation in the Amazon, imposes unique complexities for planning in the region. The result is the reactive logic of police forces, in a context that is also imposed on the work of justice bodies and agencies that protect the environment and

forest communities, such as Ibama and Funai. They all need an enhanced logistics structure to operate in the region.

In the articulation of players, including the main stakeholders – the Amazonians –, the flow of governance must start from the forest, with the people and public equipment that are there. In addition, it is crucial to intensify data collection on security in the Amazon and expedite better integration between the Unified Public Security System (Susp) and the National Environmental System (Sisnama).

Food and Nutrition Security

- In the Amazon, the infrastructure and logistics solutions are focused on the flow of commodities and does take into account the integration of communities.

- Access to healthy food and food systems must be accompanied by the debate on the right to land, to public health and the discussion on climate change.

- The resumption of public procurement policies, in addition to prioritizing small farmers, indigenous peoples and traditional populations, must provide for differentiated criteria to meet the needs of specific cultural and social realities.

The most recent report by the Brazilian Research Network on Food and Nutritional Sovereignty and Security (Pensann) shows that in 2021, of the 33 million people in a situation of moderate or severe food insecurity, 18.6% lived in households located in rural areas and 26% in the North Region, which includes eight of the nine states of the Legal Amazon (REDE PENSSAN, 2022).

In the Amazon, the infrastructure and logistics solutions are focused on the flow of commodities and does not take into account the integration of communities. The growth of cities is suppressing vegetation in the interstices. This constitutes yet another vector of social exclusion, as it creates difficulties for people to grow and manage their own food in the surrounding areas. These realities affect local supply and are reflected in the issue of sovereignty and food security.

The human right to adequate nourishment is not just a health issue. It is deeply connected to climate and to the environment, sharing many of their related causes and solutions. Therefore, access to healthy food and food systems must be accompanied by the debate on the right to land, to public health and the discussions on climate change.

The implementation of an infrastructure that enables the development and flow of production based on family farming and agroecological agriculture must be ensured.

Building climate resilience necessarily involves strengthening low-carbon agriculture. This requires policies that guarantee access to credit, market and technology. Such policies, however, must be preceded by the strengthening and implementation of public procurement programs.

The new Crop Plan for Family Farming (Plano Safra da Agricultura Familiar) pointed to significant advances in this regard. The budget for the National Policy for Family Farming and Rural Family Enterprises (Pronaf) had an increase of 34% compared to the previous period, representing the largest volume of resources ever recorded. The program now includes traditional and indigenous peoples and communities in lines of credit previously intended only for agrarian reform settlers and *quilombolas*. In addition, specific brackets were created for the promotion of socio-biodiversity, organic and agroecological products (or in agroecological transition), as well as for the productive inclusion of low-income family farmers, women and youth.

Announced at the beginning of the year and recently enacted by law, the Food Acquisition Program (PAA) was resumed, with priority given to encouraging family production by indigenous peoples, *quilombola* and traditional communities, land reform settlers, black people, women and the rural youth. In the hypothesis of participation of indigenous peoples and traditional communities, the program provides for the establishment of differentiated framing criteria to meet specific cultural and social realities.

Finally, following the recommendations of the Concertation, the National Council for Food and Nutrition Security (Consea), the main civil society channel for dialogue on federal public policies geared to food and nutrition security, was restructured. Meanwhile, there is a new frontier to be explored in the field of research: the development of alternative proteins with less environmental impact, which could pave the way for income and employment generation in the Amazon.

Connectivity

- The internet is exceptionally valuable for monitoring the region, for social productive processes, for land use management, and for access to essential public policies, such as education and health care.

- Universalization of connectivity in the Amazon is a challenge that is not limited to access only: it includes use, equipment, quality and supply.

- The Fund for Universalization of Telecommunications Services (FUST) should prioritize the allocation of resources to strategic regions of the Legal Amazon.

Data from the National Household Sample Survey (PNAD), consolidated on the Legal Amazon in Data platform, clearly show the discrepancy between digital coverage in the Amazon region versus the Brazilian average. While the percentage of households with broadband internet is 58.5% in the Amazon, in Brazil as a whole it is 77.9%. Access to 3G and 4G internet in urban areas is 68.7%, against the 70.7% country average. In rural areas that difference is more dramatic: 25.1% versus 35.5%.

The 2020 ICT Education survey also highlights how poor access to the Internet is in schools located in the North Region (51%), in rural areas (52%) and in small schools with up to 50 students (55%). This mismatch has harmful effects on access to basic rights, such as education, health care and culture, as well as to jobs and entrepreneurial opportunities by the Amazon population.

The National Council of Extractivist Populations proposes three perspectives for connectivity in the Amazon. The first is about the region: deforestation and fires, biodiversity, and the effects of climate change. The second is a territory perspective, one that may contribute to social productive configurations, and enhance land use management and governance. And the third is a perspective on public policy, as connectivity increases access to health (especially telemedicine), education (including distance learning) and technical assistance (SAFATLE, 2022).

Moreover, one trend for the coming years is convergence between the age of nature and the digital technology age. This could completely reposition the Amazon and its biotech assets.

One vision for the future is thus universalization of connectivity in the Amazon – a challenge that is not limited to access only: it includes use, equipment, quality and supply. For example, during school closures due to the Covid-19 pandemic, only 31% of rural schools in the North Region adopted remote learning. In other words, 7 out of 10 students from rural schools had their learning impaired or discontinued during the pandemic due to lack of Internet access. When schools resumed face-to-face activities, they also entailed challenges: schools and teachers were not prepared for hybrid teaching models, either due to lack of digital literacy or due to the lack of technology resources or higher-speed Internet (TIC EDUCAÇÃO, 2020).

These data might be hiding an even dimmer reality: there is little information and research on Internet access for isolated, village, *quilombola*, riverside and traditional populations in general. For this reason, bringing widespread access to quality Internet across the Amazon region requires emergency and transformative actions by the public sector.

Several initiatives in that direction, undertaken by the third sector and through public-private partnerships, are currently in motion. Recently, the allocation of at least 18% of the resources

of the Fund for Universalization of Telecommunications Services (FUST) to public education institutions was approved.

The proposition is for FUST to prioritize the application of these funds in strategic regions of the Legal Amazon, specifically for education. This measure needs to be combined with coordinated policies for the universalization of electricity and expansion of fiber optic coverage. In addition, it is important to promote and support projects at the regional and local levels for the acquisition of technology resources, for paying Internet providers for schools, and for the digital literacy of teachers and administrators.

Governance[2]

- The so-called federative pact must be resumed in order to support local and subnational governments in strengthening their institutional capacities.
- Institutional strengthening of SUDAM is crucial for regional projects to be conceived, planned and managed based on the Amazon reality, and not from an outside viewpoint.
- It is up to Brazil to take over this leadership in the articulation of supranational governance contexts.

The Amazon has numerous governances, which are heterogeneous and asymmetrical. At the institutional level, there is a wide range of organizations with differing mandates and weights in regional initiatives. Contexts entailing continental, national, regional or local scopes overlap.

The institutional context in the Amazon is capped with the presence of a heterogeneous and vibrant civil society, increasingly engaged in sustainable development. And a business community still split into segments and regions, which makes it difficult to articulate an inclusive regional project for economic transformation. Original peoples, riverine communities, *quilombola* populations, religious organizations, and enterprising youth are the powerful voices of the region, now made to be heard nationally and internationally.

Everyone will need to have proper conversations with the forces committed to reversing the region's destruction, to promoting prosperity and well-being, and to contributing to global climate balance.

Thus, it is essential to discuss the mechanisms and circumstances through which civil society and public administrations could take action jointly. This reflection should be an input for a new national policy on social participation. It would be the rise of a new institutional arrangement that strengthens the processes of formulation, execution, monitoring and assessment of public programs and policies, and one that democratizes public management altogether.

The challenge begins with local governance, as the municipality is the most structuring space and the closest to the lives of citizens. There is no way for any long-term project to be implemented in the region without taking root at the local level, that is, without being welcomed by the administrative structures of local authorities. The 772 municipalities that make up the Legal Amazon share the traditional capability and resource deficits that characterize the reality of local governments all over Brazil. They have, however, five common particularities: wide geographic extension; isolation from the rest of Brazil; the fact that they are predominantly rural; low population density; and historical deficiencies in terms of both public policies and institutional articulation. For these reasons, the so-called federative pact needs to be retrieved, so as to support local and subnational governments, together with other spheres of government, civil society, universities and the private sector. This way, their institutional capacities are reinforced so that they can comply with climate legislation and agreements as well as adopt municipal policies that are resilient to climate and economic vulnerabilities. This implies coordinated action to implement integrated, planned and prioritized initiatives within their budget, with well-defined targets and indicators. The governance of income transfer mechanisms, such as the Manaus Free Trade Zone and state and municipality participation funds, must be improved (read more in the section on the Economy, page 34).

Such actions must be taken cross-sectionally, including local policies such as health care, education, social development and assistance, urban mobility, information and communications technology, supply chain, agriculture and fishing, environment, economic development, employment, income, and many more. The current moment affords a favorable opportunity for mobilizing national and international resources to finance projects. At the national level, it is vital to rethink the performance of a number of prominent institutions, both individually and in their articulation. One of them is SUDAM, a Federal Government organization created to support development planning in the Amazon region. SUDAM's activities are based upon articulation, public policy, and instruments such as tax incentives and government funds aimed at attracting investments. Unfortunately, the agency was downplayed and still seeks to recover its planning capacity and decision-making power. This institutional strengthening is crucial so that regional projects are not conceived, planned and managed by external technicians and politicians who are distant from the Amazon realities.

The region has a sparse but not negligible institutional network. In recent years, this network was expanded with the addition of the Interstate Consortium for the Sustainable Development of the Legal Amazon. This ecosystem of government organizations includes research support foundations, public security forces, environmental and land-use authorities, besides the traditional administrative structures of state governments.

Still regarding the public arena, it is important to take into account the legal establishment, both at the federal and state levels, constituted by the Federal and State legal systems, State and Federal Prosecution Offices, and Federal and State Accounting Courts. In addition to these authorities, there are still the Notary Public offices, which play a crucial role in land tenure regularization.

Added to this ecosystem are initiatives that connect subnational governments in the Amazon with their counterparts in other countries. Examples include the Governors' Climate and Forests Task Force (GCF Task Force) and the Forum of Pan-Amazonian Cities. Both were created with the purpose of exchanging knowledge and experiences that might contribute to reducing GHG emissions and to the advance of sustainable development.

At the supranational level, organizations such as the Amazon Cooperation Treaty Organization (ACTO), the Inter-American Development Bank (IDB), the LEAF initiative (a coalition that seeks to reduce emissions through the acceleration of forest financing), and the Economic Commission for Latin America and the Caribbean (ECLAC), among others, have an important role to play in the region. And the only possible leadership to rise up to the challenge of this articulation is that of Brazil.

Culture

- It is important to (ac)know(ledge), value and disseminate the sociocultural wealth of the Amazon.
- Contemporary Brazil needs to strengthen its identity(ies) and this entails buttressing cultural and artistic symbols that represent the Amazon.
- The precision of science must be drawn closer to the power of art so that a balance between rationality and sensitivity indicates new paths.

The main challenges of the different Amazônias are related to sociocultural appreciation and to their corresponding identities. In view of this, the Amazon Concertation regards this territory as a landscape, placing culture at the center of discussions and action. Culture expresses sensitivity and contemplates ways of life, ways of doing things and ways of representing this space. Similarly, art is more than an illustration: it is a source of sensitive information about the territory, making it possible to update collective imaginaries and break stereotypes.

According to the study “Identification of social groups in the Legal Amazon”, the challenge lies not in mapping, but in characterizing the Amazon society. And in doing this with all its contradictions and complexities, its different flows and networks, based on sometimes dispersed and inaccurate information, or on invisible data, invisible groups, controversy and interests that hover over this region. A daring proposal that binds these people through time in this space is called for. This is the bond that weaves culture and forms society.

Each group that was already there, or that for different reasons arrived and settled in those lands, has a unique relationship with this territory, led by different ambitions and affections. These identities are ever-shifting, time-transcending, activated and deactivated according to the moment, the context and the conflicts that arise.

The Amazon does not afford simplifications. It is imperative to address the complexity of thinking about these peoples – almost 30

million individuals – without ripping them out of their places or leaving them stuck in time. These people who live in the land replicate ancestral references and influences that persist in their memories and in their ways of life. This inseparable triptych (time/space/people) contributes to the process of forming the identities of these peoples, be them traditional, native populations or representatives of generations that migrated from other regions of the country to these new lands.

There is no one single Amazon culture, but several. Understanding the articulation between culturally different appropriations of the territory and of the activities carried out therein is a fundamental aspect in formulating and implementing policies, projects and initiatives in the Legal Amazon. Fluid borders, territories and identities are supplemented by sedimentations: the rooting of sociocultural experiences in structures, ways of life and relationship patterns. Flows and sedimentations form cultural webs, networks of multiple interactions that intertwine meanings and practices by assessing experiences in the territory. The Amazon needs to be understood through a plural lens. Thus, "the Amazônias" represent the way The Amazon Concertation refers to this territory, not only because of its natural environment, but also because of its culture. Culture represents who we are, it shapes our identities. And for this reason, it must be at the heart of development policies that promote an agenda that can containing forest degradation, reconciling environmental protection and social justice.

The fight against deforestation

- Initiatives should not be restricted to command and control, undeniably strategic to detecting and curbing deforestation, but should include economic alternatives geared to sustainable development, particularly to advance the bioeconomy.

- The challenge of curbing deforestation is one example of the interconnection among agendas, such as that of public security, of reducing social inequalities and of agricultural and forestry production, with benefits for small producers.

- The new Action Plan for Prevention and Control of Deforestation in the Legal Amazon (PPCDAm) is the main federal program devised to achieve the deforestation target by 2030, with positive impacts on income generation and quality of life in the forest.

The Brazilian Legal Amazon lost 11,594 km^2 of forest in 2022, an area equivalent to the size of Jamaica. According to data from the annual Prodes survey, conducted by the National Institute for Space Research (INPE), that number dropped by 11% when compared to the previous year, which recorded 13,038 km^2 of lost forest, but is still the second highest figure since 2008. Pará (34.6%) and Mato Grosso (31.5%) were the states with the highest deforestation rates.

Forest clearing, which began to rise in 2012, accelerated from 2018 on, with a rate above the 10,000 km^2 threshold, and today it shows a 60% increase compared to four years ago. In total, the Legal Amazon lost 12% of its forests in 34 years, according to MapBiomas.

The main instrument for reversing this curve is the new Action Plan for Prevention and Control of Deforestation in the Legal Amazon (PPCDAm), announced in June 2023 by the Federal Government, with initiatives on several fronts. Launched for the first time in 2004, when the region had reached a record 27,800 km2 of felled forest, the plan was responsible for a historic 83% reduction in deforestation by 2012.

A study by the Amazônia 2030 project concluded that environmental control initiatives were critical for that drop. The improvement took place thanks to inspection and monitoring systems, in addition to the adoption of environmental and land tenure requirements in granting rural credit and in ownership protection.

In its new version, the PPCDam will have 13 ministries working together in its execution and will be the basis for achieving the goal of zero deforestation in the Amazon by 2030. The plan is structured around four axes: sustainable production activities; environmental monitoring and control; land tenure regularization and land use planning; and normative and economic instruments. There are 12 general objectives and 36 expected results, broken down into 176 lines of action.

In addition to monitoring and enforcement to punish environmental crime related to deforestation and forest degradation, the strategy provides for encouraging sustainable forest management and for recovery of deforested or degraded areas. The PPCDAm also provides guidance for articulation with the states in the Legal Amazon in initiatives to promote sustainable production. Emphasis on the development of the bioeconomy, thus keeping the forest standing, is a differentiating factor of the new plan.

Concerning land tenure regularization and land use planning, the objectives are: to guarantee the protection of non-allocated public lands against land grabbing; to expand and strengthen the management of protected areas; to improve the National Rural Environmental Registry System (SICAR); and to align the planning of large infrastructure projects with the goal of zero deforestation by 2030. The Action Plan also intends to create and improve

normative and economic instruments aimed at curbing deforestation. Traceability mechanisms for forest supply chains and public procurement policies for the benefit of small producers are some related examples.

The PPCDam, with its axes and planned initiatives, is in line with the proposals for curbing deforestation devised by experts in the working groups and thematic rounds of discussion of The Amazon Concertation. This theme is a remarkable example of the interconnection among agendas, namely the biodiversity economy, the fight against violence and violations, and the reduction of social inequality by strengthening small producers and traditional populations.

Climate change

- Climate change can bring about disruptive transformations, threatening not only ecosystems, but all forms of social coexistence.

- The Amazon plays a central role in regional climate regulation and exerts a crucial influence on the global climate system.

- It is of utmost importance to immediately stop deforestation in the region as well as to implement restoration strategies to avoid ecosystem collapse. Deforestation must not overshadow the climate agenda, which encompasses challenges such as energy and industrial transition, along with adaptation.

The Amazon Forest, due to its size and relevance to the regional hydrological cycle, exerts enormous influence on the climate of South America, and it also interacts with climate variables at a global level. In addition to its role in biodiversity and in water regulation and supply, the Amazon also functions as an immense carbon reserve, which threatens to reach the atmosphere if forest degradation continues. Reduction in native vegetation affects essential processes in the regional hydrological cycle and in the global atmospheric balance. This is the case with of the so-called "flying rivers", which transport moisture responsible for the rains that irrigate crops and livestock farming and supply water to cities and manufacturing in the Center-South of the country.

Between 1985 and 2021, the Amazon lost 12% of its forest area, a net loss of 44 million hectares, 35.2% in Pará state alone. In parallel, in 2020, deforestation in the Amazon was responsible for the emission of 782 million tons of CO_2 equivalent.

In a scenario of more intense emissions, temperatures in the Amazon could increase by up to 6ºC by the end of the 21st century. Increase in temperatures, deforestation, and forest degradation from fires, combined, change the seasons in the region, with more intense extreme events. These impacts impair ecosystem functions in the biome, undermining for instance its ability to absorb carbon from the atmosphere. Furthermore, these processes culminate in forest fragmentation, which, in turn, makes the forest more vulnerable to "edge effects", such as fires and strong winds.

As a result, the Amazon Forest is approaching the point of no return, or tipping point – the threshold at which a small disturbance may cause irreversible imbalances, perhaps increasingly rapid and severe ones. In that scenario, negative synergistic effects among deforestation, fires and temperature increases may lead to a cascading effect towards savannization. According to estimates, 20% to 25% of deforestation is the limit above which portions of the Amazon cease to be forest formations. To avoid ecological collapse and its effects on a global scale, deforestation in the region must be immediately stopped and strategies must be sought to regenerate its vital hydrological cycle.

This context is marked by a confluence of factors beyond environmental issues, such as deficient structuring social policies (health, education, sanitation, among others), the advance of unlawful or illegal activities in the forest, and the frailty of democratic institutions. It is a carbon-intensive model based on the degradation of ecosystems.

One solution path is the implementation of protected areas (conservation units, indigenous lands, and agro-extractivist farming and sustainable development settlements) that contribute to reducing deforestation and to capturing carbon from the atmosphere. Yet, these territories are increasingly vulnerable to the ad-

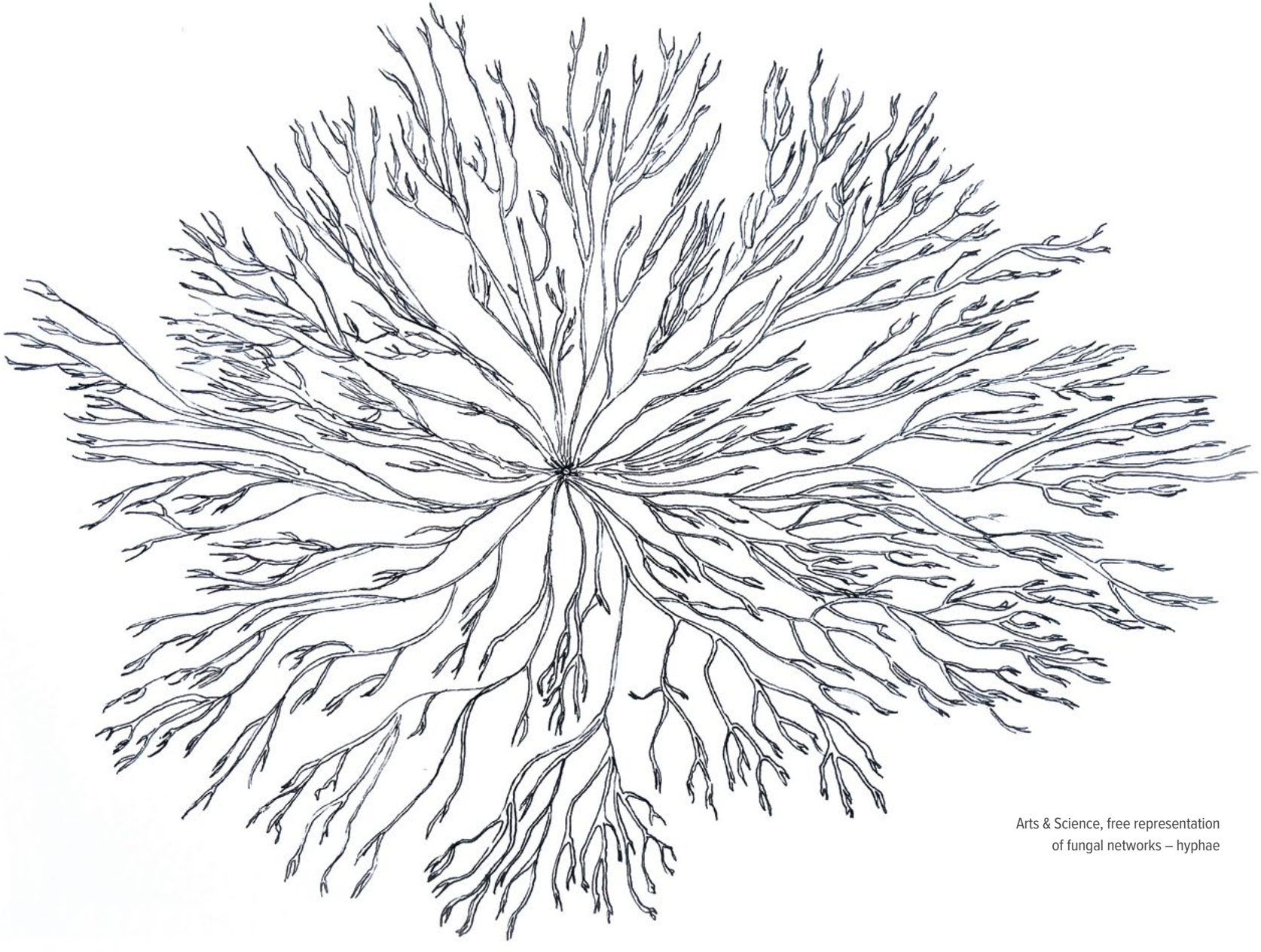
vance of environment-degrading activities and subject to greater climate variability. One consequence is the negative impact on the lifestyles of people who inhabit these places – indigenous, riverine and *quilombola* communities –, precisely those who contribute the most to climate mitigation and, at the same time, who most feel the effects of climate change.

Climate change compromises food security for the population in 62% of the municipalities in the Legal Amazon, according to data from the Ministry of Science, Technology and Innovation (MCTI). This and other diagnoses point to the need to tackle the issue with a bias towards climate justice.

Therefore, in addition to national policies to curb deforestation, the climate emergency challenge requires intersectoral and interstate collaboration and coordination, including both mitigation initiatives and adaptation to the effects of existing changes. Although the weight of emissions from deforestation and land use is considerable, the climate agenda should undoubtedly include initiatives in the manufacturing, energy and transport sectors. In metropolitan areas, waste disposal in dumps or landfills is one of the main sources of greenhouse gas emissions.

Along with energy and industrial transition, there is the added challenge of incorporating trends such as the circular economy and digitalization, which may drive new development models and create job opportunities. This requires planning in other sectors, such as education, with greater effort towards climate literacy, starting with educators.

At the state level, it is essential to advance policies for climate change adaptation, with permanent alert and contingency protocols for monitoring hydrometeorological hazards. Besides participation of civil society in the formulation of public policy, these strategies call for transparency of data on climate governance.



Arts & Science, free representation
of fungal networks – hyphae

PART 02

AN AGENDA FOR THE AMAZON
CONNECTIONS AMONG THEMES AND CONTEXTS

part 02

An agenda for the Amazon: connections among themes and contexts

The attempt to understand the world around us involves recognizing that seldom is knowledge isolated. Various disciplines, concepts and ideas are interconnected, forming a complex network of themes. It is particularly important that we broaden the look at this interconnectivity and identify the relationships among themes when the solutions we want to achieve involve the so-called "wicked problems".

Wicked problems are complex, ambiguous, contradictory and volatile (RITTEL AND WEBBER, 1973). With no delimited boundaries, they cannot be defined in their entirety, which makes them difficult to formulate, measure and, of course, manage.

In addition, the decision-making process is hampered by the lack of a complete assessment of the situation. The advancement of development in the Amazônias may be considered an example of a wicked problem in an environment of bounded rationality. In this case, the complexity of a problem with a global scope requires efforts from different players in different places. And each adopted solution changes the understanding of the problem, resulting in a new context.

Even when the dimension of a wicked problem is minimally defined, the solutions to overcome it are never unique or definitive. Every attempt to work out a solution contributes to changing the understanding of the problem, which is redefined in the light of alternatives that emerge, in a constant process of transformation (WAACK *et al*, 2023). For this reason, the debate on the Amazon is continuous and does not end with a conclusion.

The permanent discussion about relationships among structuring themes of the Amazon development agenda and its strategic issues keeps the Concertation network mobilized. This mobilization, in turn, contributes to co-creating and developing skills and resources geared towards solving problems. And also to nurturing innovation processes capable of producing multidimensional solutions and creative institutional arrangements.

A more complete view of the whole

Fragmenting the Amazon development agenda into isolated knowledge silos entails the risk of missing the big picture. But by exploring structuring themes and their relationships, a more comprehensive and holistic understanding of various subjects is reached. The interconnection among themes enables us to see patterns, relationships, social agents and influences that shape our understanding.

For example, studying interactions among the fight against deforestation (environmental dimension), extractivism (economic dimension) and education (social dimension) helps us understand the challenges posed by the climate emergency in the Amazônias. And thus achieve more appropriate solutions for local contexts.

Causalities and implications

Observing interdependent themes allows us to realize the causality among them and to identify the implications of one on the other. For example, the theme of public security is linked with the dimensions of human development and environmental conservation (WAISBICH *et al*, 2022). By identifying these connections, it is possible to track down the causes of problems, identify hidden risks, and anticipate possible consequences.

This knowledge is invaluable for policy makers, scientists and decision makers working in the Amazon. It allows for greater precision in the execution of proactive and preventive measures, in the mitigation of negative socio-environmental impacts and in the identification of “win-win” strategies.

Stimulus to innovation

Connecting themes encourages cross-pollination of ideas. When concepts from different domains converge, new perspectives emerge, leading to new ideas and creative solutions. Many groundbreaking innovations have emerged from interdisciplinary collaborations. By transcending disciplinary boundaries, decision makers can leverage their knowledge and ideas to make transformative breakthroughs.

The interdisciplinary project Itinerários Amazônicos (Amazon Itineraries), arising from exchanges initiated within the scope of the Amazon Concertation, is an emblematic example. In this project, the exploration of related themes has already resulted in important social advances for the inhabitants of the Amazon region.

Considering relationships among structuring themes is therefore consistent with an integrated approach to understanding the contemporary Amazônias. This broad perspective makes it possible for the Concertation to build and strengthen its capacity, as an institution, to deal with socio-environmental challenges in the

Amazon and design cooperation paths. This includes improving responses by government entities in order to provide a future with quality of life for its residents, guardians and for humankind.

The six structuring themes: connections and centralities

The application of the integrated approach by the Concertation starts with identifying the relationships among six themes of the Amazon development agenda: Bioeconomy, Science, Technology and Innovation, Education, Indigenous Peoples and Traditional Communities, Health, and Security.

These themes are considered key to the Concertation because they are frequently at the center of local, regional, national and international public debate. And they are also explored in the forums and events in which the network has a presence, when the subject is environmental conservation and the improvement of the quality of life in the Amazon. Furthermore, they connect to a numerous issues: environmental (biodiversity, for example), social (food and nutrition insecurity) and economic (financing). And because these are all interdependent issues, they "hold back" the advancement of regional development agendas.

Two supplementary analytical perspectives were used to connect the themes: the overall perspective and the perspective of each of the six themes.

The overall perspective is presented through the network of relationships among structuring themes that opens the collection of networks in Section 2. Its configuration consolidates the themes and the relationships among them. In this network, there is a set of 19 themes, which differ in relevance (indicated by the size of the circle), and which are interconnected based on different relationships.

The general network: connections among themes

The general network includes structural themes, themes of the Amazon development agenda explored in Section 1, and the indication of themes that are not yet on the radar or in the forums promoted by the Concertation, such as family farming, territorial management and biodiversity.

The size of theme circles indicates the number of connections to other themes. In the general network, the centrality of the themes Indigenous Peoples and Traditional Communities and Science, Technology and Innovation is evident. Their large number of connections indicates that the development of projects and initiatives in these sectors could have a major impact on the political, economic and social scenario of the Amazônias in 2023. This becomes clear due to their potential to leverage the progress of the analyzed agenda as a whole.

In the context of scarce financial and human resources, this type of analysis can guide and support a system, or even a timetable for developing and implementing impactful projects for the region.

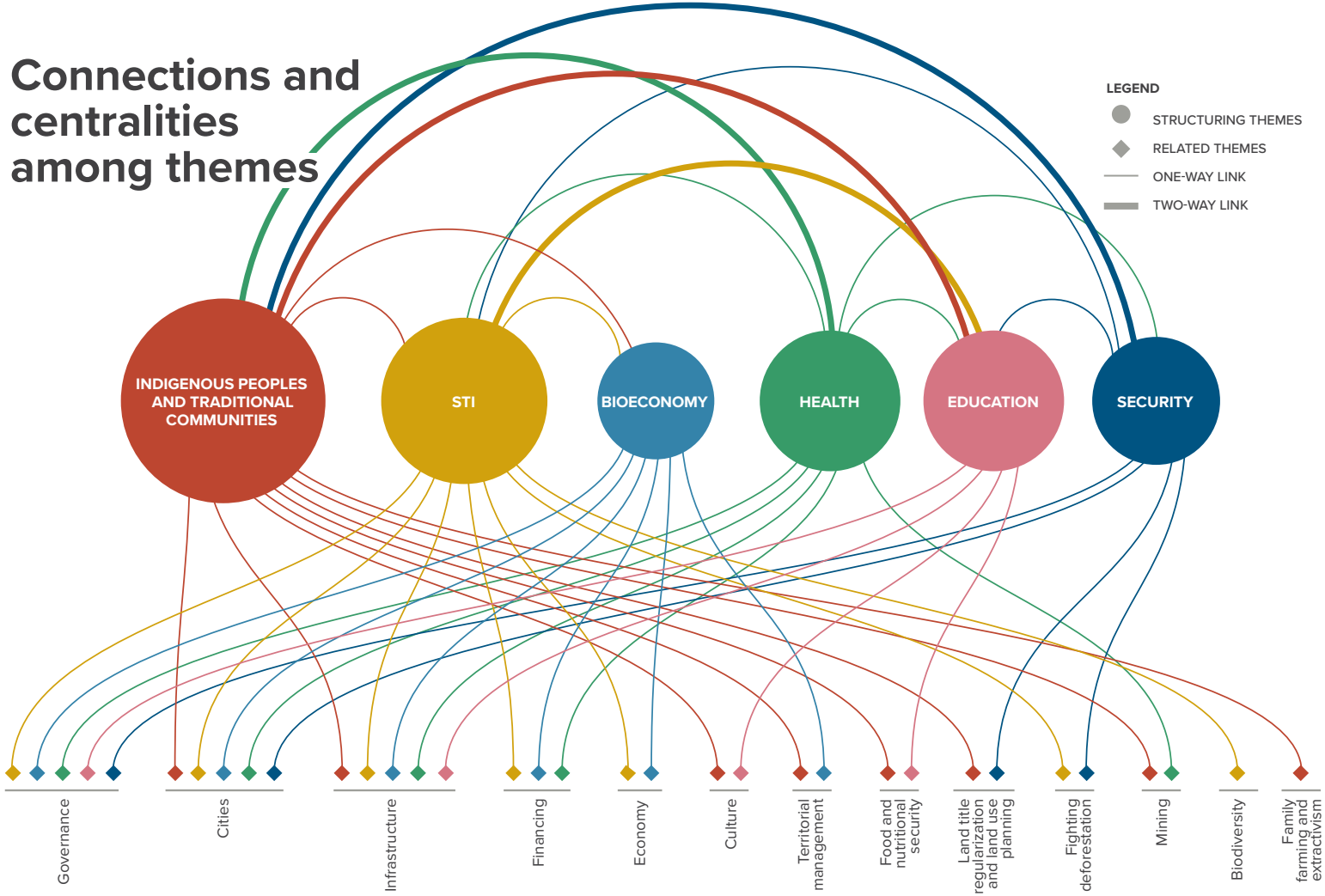
The general network and the network of inter-thematic themes derived from structuring themes are an exercise in the application of the integrated approach to tackle the Amazon development agenda. As it is a starting point for observing the interaction among themes, this exercise does not cover many of the key themes of this agenda, nor does it provide definitive answers. It is also worth mentioning that the network is a dynamic and relational analytic tool that changes as new themes are brought in for analysis (BARABASI, 2005; BORGATTI *et al.*, 2013; LE BLANC, 2015). Thus, as more themes are brought to the analysis, other important relationships and patterns may emerge[1].

Inter-thematic networks: connections from the perspective of structuring themes

Each thematic section, presented after the general network, is composed of a network of relationships, an infographic and a text that contextualizes the themes for the Legal Amazon. Each configuration is the result of an effort that involved thematic curatorships conducted by specialists in each subject and that were supplemented by reports used in the document 'The First 100 days of government', published by the Concertation in 2022.

Thematic networks bring two important pieces of information for their better understanding. The first is the theme's connection with other themes on the development agenda. The second is the qualification of the relationship among sectors. For example: bioeconomy connects with indigenous peoples and traditional communities on issues related to improving the quality of life of these social groups and also on strategies aimed at the social inclusion of these groups. Bioeconomy connects with security regarding the need to ensure the production, distribution and creation of new businesses and services. The same organization of information appears in the inter-thematic networks of science, technology & innovation, education, indigenous peoples and traditional communities, health, and security.

Connections and centralities among themes

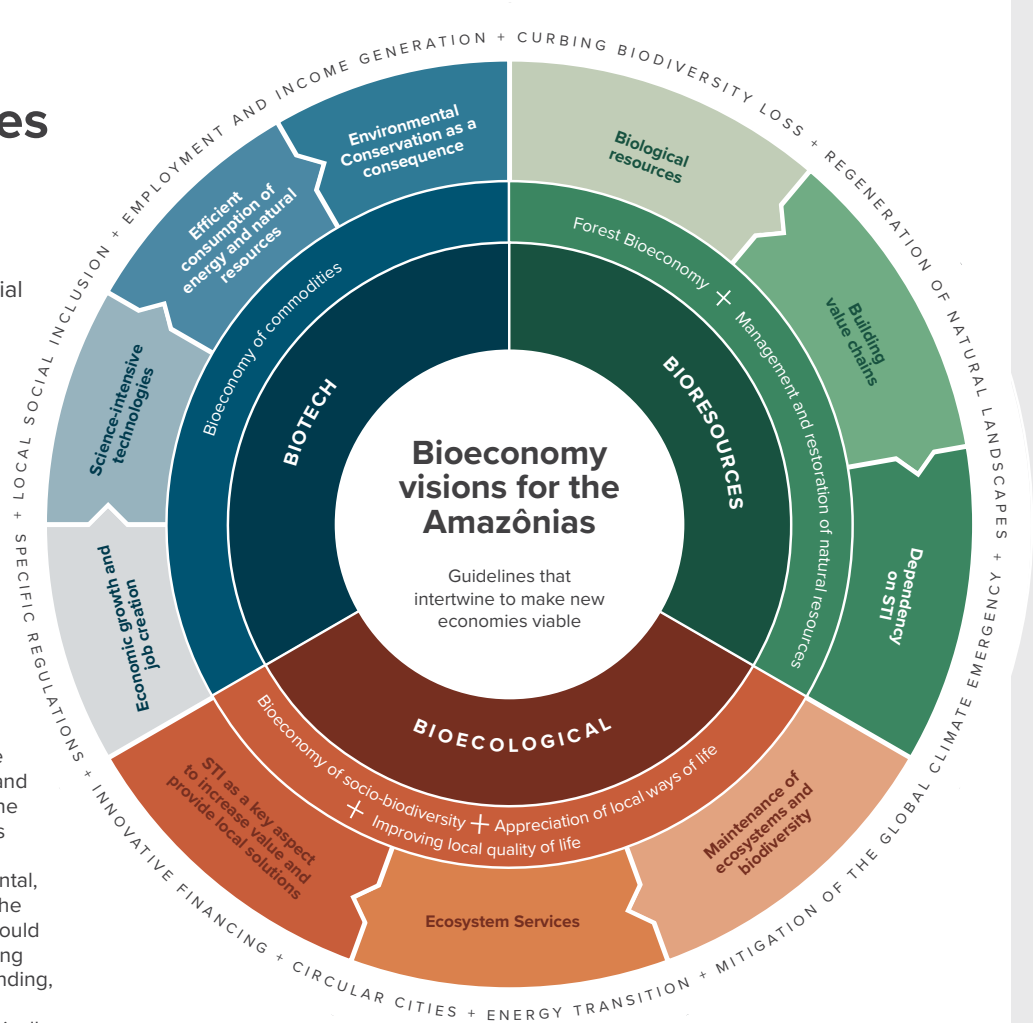


01

Bioeconomy

Diversity of bioeconomies

Bioeconomy is an evolving concept and emerges in different, interconnected ways. Qualifying it is essential to avoid strengthening historical vectors of land use change and income concentration, especially in the Amazon.



POPULARIZATION OF THE CONCEPT

The climate emergency and the contradiction between natural and cultural wealth and poverty in the Amazon call for new economies committed to the simultaneous advancement of the environmental, economic and social agenda. The bioeconomy is a strategy that could engender convergence regarding the need to keep the forest standing, promote economic growth and improve the well-being of historically vulnerable groups.

GUIDING PRINCIPLES FOR AN AMAZON BIOECONOMY

1. Conservation and appreciation of socio-biodiversity;

2. Socio-productive **inclusion**;

3. Reduction of social and territorial inequalities;

4. Socioeconomic **development** of the region;

5. Fostering science and technology development aimed at the conservation and sustainable use of biodiversity;

6. Appreciation of traditional knowledge;

7. Expansion of areas of native, biodiverse vegetation with sustainable use;

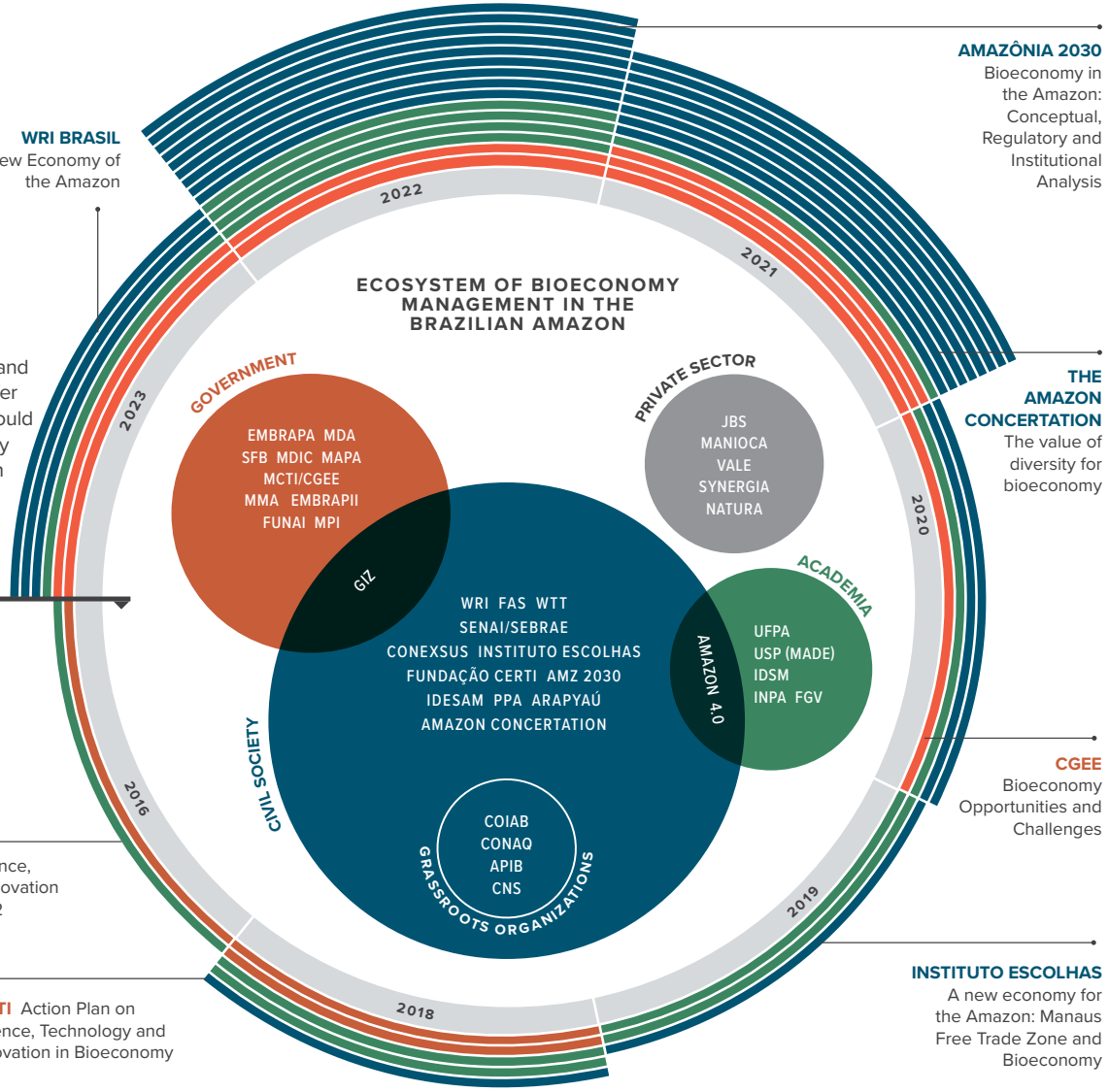
8. Mitigation of and adaptation to climate change;

9. Promotion of ethnic, racial, gender and environmental justice.

SOURCE: BIOECONOMICS WG OF THE AMAZON CONCERTATION

Brazilian and Amazon bioeconomy Trends

Between 2017 and 2023, different sectors in Brazil have been dedicated to the discussion and publication of documents that address and offer recommendations for the definition of what would be a local-regional-national-global bioeconomy strategy suited to the Brazilian and Amazonian realities. As of 2019, civil society increased their participation in drawing up this agenda.



PUBLICATIONS
BY YEAR AND BY SECTOR

- GOVERNMENTS
- ACADEMIA
- CIVIL SOCIETY
- MAIN PUBLICATION OF THE YEAR

WRI BRASIL
New Economy of the Amazon

AMAZÔNIA 2030
Bioeconomy in the Amazon: Conceptual, Regulatory and Institutional Analysis

THE AMAZON CONCERTATION
The value of diversity for bioeconomy

CGEE
Bioeconomy Opportunities and Challenges

INSTITUTO ESCOLHAS
A new economy for the Amazon: Manaus Free Trade Zone and Bioeconomy

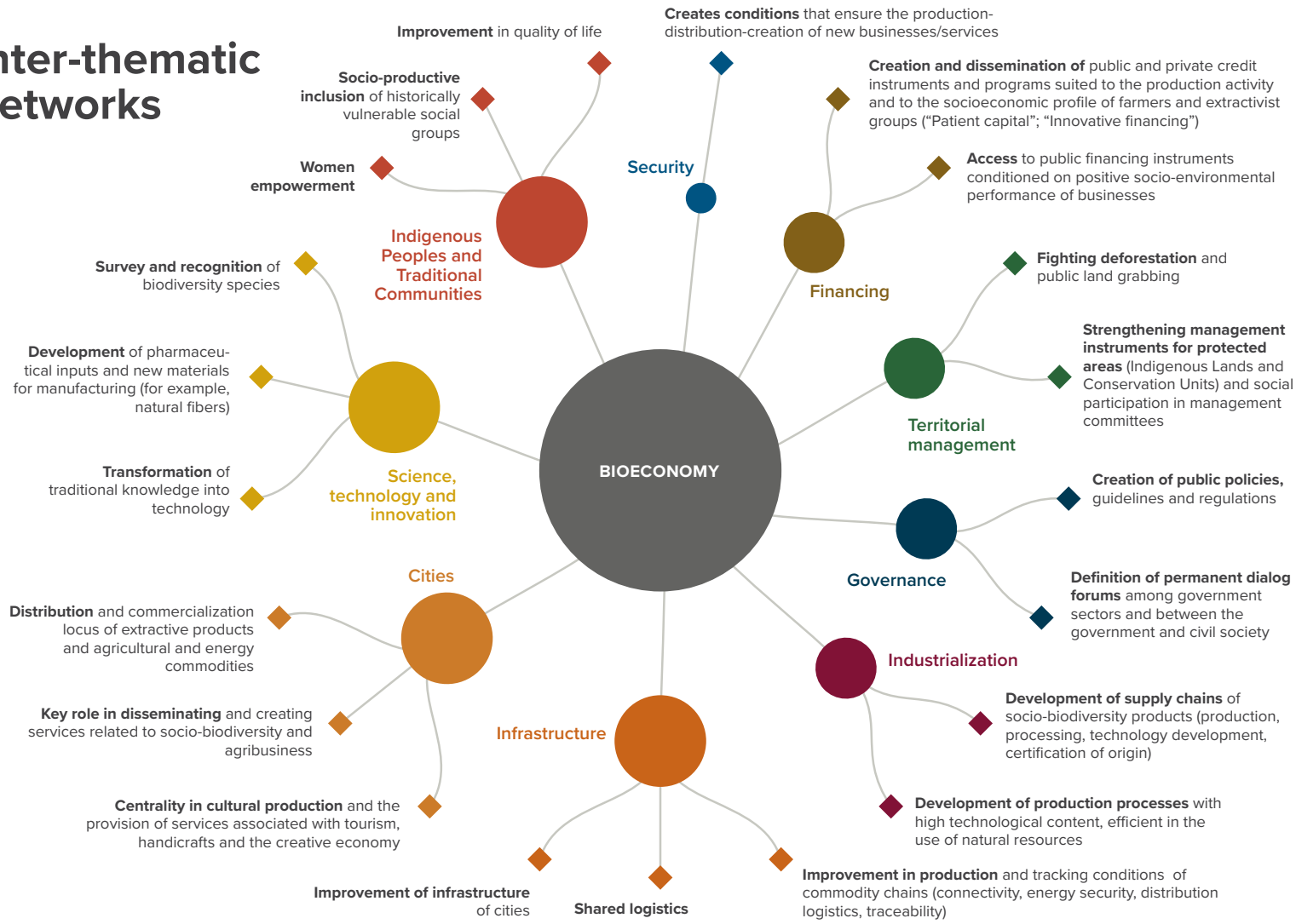
BUGGE, M.; HANSEN, T.; KLITKOU, A. What is the bioeconomy? A review of the literature

MCTI National Science, Technology and Innovation Strategy 2016-2022

IDESAM, PPA, SITAWI, USAID
Impactful investment in the Amazon: paths to sustainable development

MCTI Action Plan on Science, Technology and Innovation in Bioeconomy

Inter-thematic networks



The term bioeconomy has been the focus of narrative disputes and has gained prominence in several scientific, political and economic agendas in the last 50 years, having become popular since 2010. The term first appears in 1918, when the Russian marine biologist Baranoff draws attention to the predatory exploitation of fishing resources, demonstrating how shoals of fish were affected due to overfishing (GIAMPIETRO, 2019).

At the turn of the 1960s to 1970s, the term reappears in the biological approach to economic theory. It was then proposed that the economic system is part of nature and not the other way around (CECHIN and VEIGA, 2010; GEORGESCU-ROEGEN, 1971 and BIRNER,2018). Although the academic debate has brought another perspective on the role of nature, which should be understood as a provider of fundamental ecosystem services for the maintenance of life, reflection on the development of new economic models for the production of goods and services was only resumed in the years 2000. This occurred in the context of international commitments to reduce greenhouse gas (GHG) emissions and, more recently, as a result of the global climate emergency.

In the international arena, the term emerged in the context of economic development policies in Europe. And it has been embedded in strategies to help industrialized countries to move from an economy dependent on fossil fuels to an economy based on biological inputs (EU, 2007). The bioeconomy presented itself as an instrument to meet the growing demand to review the production paradigm. In this context, bioeconomy was defined as a means of "transforming knowledge from the biological sciences into new, sustainable, efficient and competitive products" (EU, 2007, p. 2).

As of 2012, this debate, fueled predominantly by developed countries, began to be adapted to other contexts (WRI BRASIL, 2023). However, the diversity of interpretations and the lack of convergence among them demonstrate the flexibility of the term and its still developing maturity status. In a broad perspective, the various definitions of bioeconomy start from the assumption that the maintenance of the natural infrastructure is necessary to perennially sustain economic processes (BNDES, 2021).

In Brazil, several documents and studies published since 2016 have been trying to understand which conception of bioeconomy would be best suited to the Brazilian reality. And to point out which economic sectors and production chains could benefit from public policies aimed at leveraging this agenda (MCTI, 2018; INSTITUTO ESCOLHAS, 2019; CGEE, 2020; UMA CONCERTAÇÃO PELA AMAZÔNIA, 2021; LOPES E CHIAVARI, 2022). Many of these studies are based on the contributions of the publication "What is the bioeconomy? A review of the literature" (BUGGE, HANSEN and KLITKOU, 2016). The text approaches bioeconomy

Lentinula raphanica

Edible species and part of Yanomami cuisine; essential species for fungiculture projects – mushrooms that are edible and native to the Amazon, such as INPA's. Discovered in 1943, the type locality of the species is in Florida.

from three perspectives: biotechnological bioeconomy, bioeconomy of bioresources and bioecological bioeconomy.

The three perspectives might be intertwined, although they have their particularities when applied to certain territories, such as biodiverse, tropical and inhabited regions. When transported to the tropics, that approach needs to be adapted to local context factors such as the degree of biodiversity, sociodemographic aspects, ways of life, historical processes, and the evolution of land use and occupation patterns (Uma Concertação pela Amazônia, 2021; SYNERGIA, 2023).

In Brazil, the term bioeconomy has different uses and applications. In 2018, the Ministry of Science, Technology and Innovation (MCTI) was a pioneer in defining the bioeconomy as: "the set of economic activities based on the sustainable and innovative use of renewable biological resources (biomass), replacing fossil raw materials, for the production of food, feed, materials, chemical products, fuels and energy produced through biological, chemical, thermochemical or physical processes, promoting health, sustainable development, national growth and the well-being of the population" (MCTI, 2018). The Center for Management and Strategic Studies (CGEE) understands that: "The bioeconomy comprises all economic activity derived from bioprocesses and bioproducts that

contribute to efficient solutions in the use of biological resources that promote the transition to a new model of sustainable development and well-being of society" (CGEE, 2020, p. 14).

The recent and growing threats of climate change and the contradiction between the natural and cultural wealth and the rising poverty in the Amazon biome have increased the need to strengthen economies engaged in the simultaneous advancement of the environmental, economic and social dimensions. Due to the forest's impact on mitigating global warming and conserving ecosystem services, the bioeconomy gains relevance in the Amazon biome, with some reservations. That's because this region holds the largest biodiversity reserve in the world and is a frontier for expanding the production of agricultural and energy commodities. In addition, it is home to numerous and diverse traditional populations that are socially vulnerable. These are peoples who know well and ensure the preservation of natural resources through their way of life.

Social movements, third sector organizations and members of the academia have been highlighting the need to promote a dialogue between scientific research, innovation and funding instruments and traditional and harmonious ways of living and producing. This way, it would be possible to transpose the bioeconomy agenda so that it also drives the local development of new products and services. Organizations emphasize that ignoring this dialogue may result in dynamics that threaten the autonomy and territorial security of local populations. And they argue that the adoption of a socio-bioeconomy perspective can have a positive impact on the social and productive inclusion of traditional communities (COIAB, 2021; LOPES E CHIAVARI, 2022; PAGE 22, 2021; BNDES, 2021; WRI BRASIL, 2023; WTT, 2022).

Generally speaking, a region characterized by diverse territories requires the development of a broad bioeconomy agenda, in which different economic activities, sectors of society and landscapes are considered. The literature on this discussion highlights that the transposition of the agenda should be guided by some basic requirements: keeping the forest

PAINEL DA FLORESTA (FOREST PANEL)

Digital platform that gathers and presents data on Bioeconomy products in Brazil. Carried out by **Coalizão Brasil**, **Clima**, **Florestas e Agricultura** and the **Amazon Concertation**, the project has two main panels: **Chains** - which presents data for each of the products available over time and the Brazilian territory - and **Compare Products** - which allows you to compare several products at the same time.

standing and rivers flowing, generating income, and improving the living conditions of the local population. According to Bergamo and colleagues (2022), an Amazonian bioeconomy must transcend the traditional approach to forest-based products and include aspects related to: a) zero deforestation; b) the strengthening of ancient cultural and economic practices of traditional populations; c) the diversification of methods and production, valuing biodiversity as a response to monoculture; and d) the equitable sharing of benefits with local communities.

The networks of people, researchers and organizations involved in the Amazônia 2030 and the Amazon Concertation initiatives converge on the understanding that the different contexts of the Brazilian Amazon require different bioeconomy perspectives. In conserved areas, for example, bioecological and biotechnological perspectives (bioeconomy of socio-biodiversity) may be important to add value to the standing forest and to the knowledge and ways of life of traditional communities. In deforested regions, in turn, biomass production, from the perspective of bioresources (commodity bioeconomy), may be an alternative for restoration. And in the case of regions under potential risks of forest degradation (transition areas), the bioecological and bioresources bioeconomy (forest bioeconomy), through agroforestry systems (SAFs), may be economic options to curb deforestation (Amazônia 2030, 2022a and Amazon Concertation, 2021a).

Due to the forest's impact on mitigating global warming and conserving ecosystem services, the bioeconomy gains relevance in the Amazon biome, with some reservations.

Between 2017 and 2023, different organizations from the public sector, private sector, academia, third sector, as well as community-based organizations have been dedicating themselves to discussing and publishing documents that address this issue. They put forward recommendations for defining what would be a national-regional bioeconomy strategy suited to the Brazilian and Amazonian reality. During this period, especially from 2019 onward and among civil society organizations, there has been growth and diversification of stakeholders and subjects involved with the theme, and an ecosystem dedicated to managing that agenda in the Brazilian Amazon has been established.

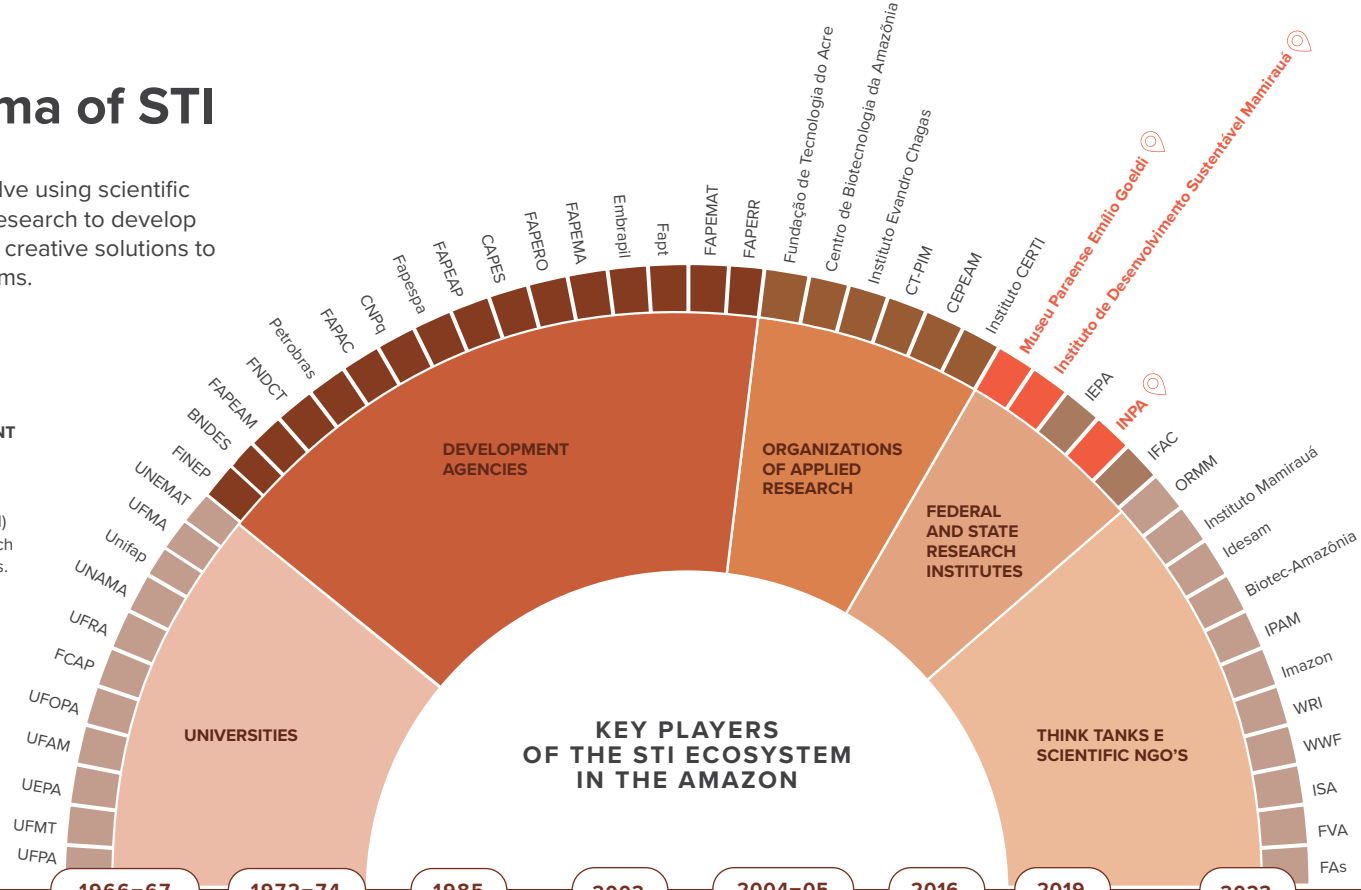
02

Science, Technology and Innovation

Panorama of STI

STI activities involve using scientific knowledge and research to develop technologies and creative solutions to real-world problems.

3
OUT OF THE 27 FEDERAL GOVERNMENT ORGANIZATIONS
linked to the National System of Science and Technology (SNCT-MCTI) are dedicated to research in the Amazon territories.



LEGAL AND HISTORICAL MILESTONES

1951
Creation of the National Council for Scientific and Technological Development – CNPq and the Coordination for the Improvement of Higher Education Personnel - CAPES

1966–67
Creation of FUNTEC and FINEP

1972–74
I National Development Plan (I PND), in which the economic policy was based on fostering industrialization

1985
Creation of the Ministry of Science and Technology (MCT), which centralized the federal system of science and technology

2003
Creation of the National Secretariat of Science and Technology for Social Inclusion (SECIS)

2004–05
Innovation Law regulates collaboration between private companies and education institutions

2016
National STI Strategy (ENCTI 2016-2022)

2019
Leticia Pact, scientific cooperation agreement between Bolivia, Brazil, Ecuador, Colombia, Guyana, Peru and Suriname for decision-making regarding the Amazon

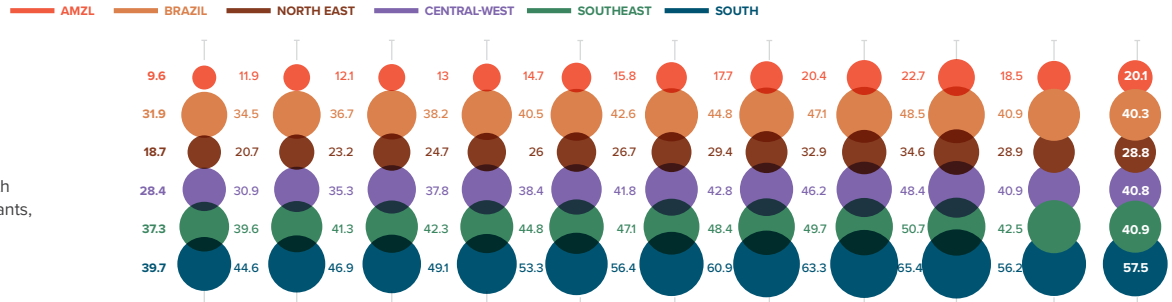
2023
Creation of the Secretariat of Science and Technology for the Amazon linked to the Executive Secretariat of MCTI and managed by an Amazonian academic

STI in numbers

RATE OF PEOPLE WITH MASTER'S AND DOCTORAL DEGREES

Despite the 109.4% growth in the last decade, in 2021 the Legal Amazon had a rate of 20 people with master's and doctoral degrees per 100,000 inhabitants, lower than that of the rest of the country (40).

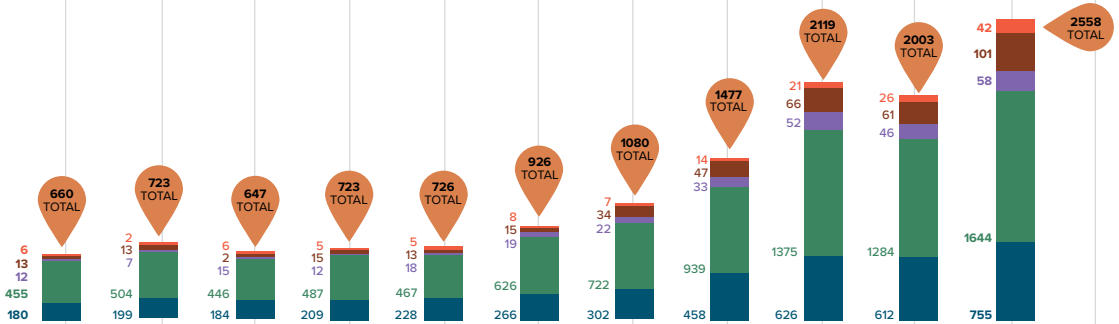
SOURCE: AMAZÔNIA LEGAL EM DADOS, 2022A.
*BRAZIL WITHOUT THE STATES OF THE LEGAL AMAZON REGION. CENTRAL-WEST WITHOUT MT. NORTHEAST WITHOUT MA.



NUMBER OF PATENTS GRANTED

Patents are the result of the innovation capacity and effort of RD Centers and companies. There was a significant growth in patents granted, from 6 in 2010 to 42 in 2020. Despite this growth, the region has a poor performance in the sector, holding 1.6% of Brazilian patents granted (n = 2,558) in 2021. 42% of the granted patents are concentrated in the state of AM.

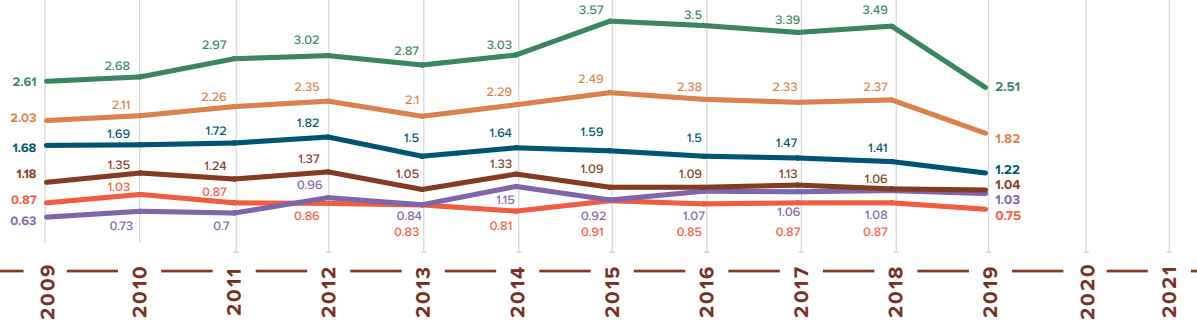
SOURCE: AMAZÔNIA LEGAL EM DADOS, 2022B.



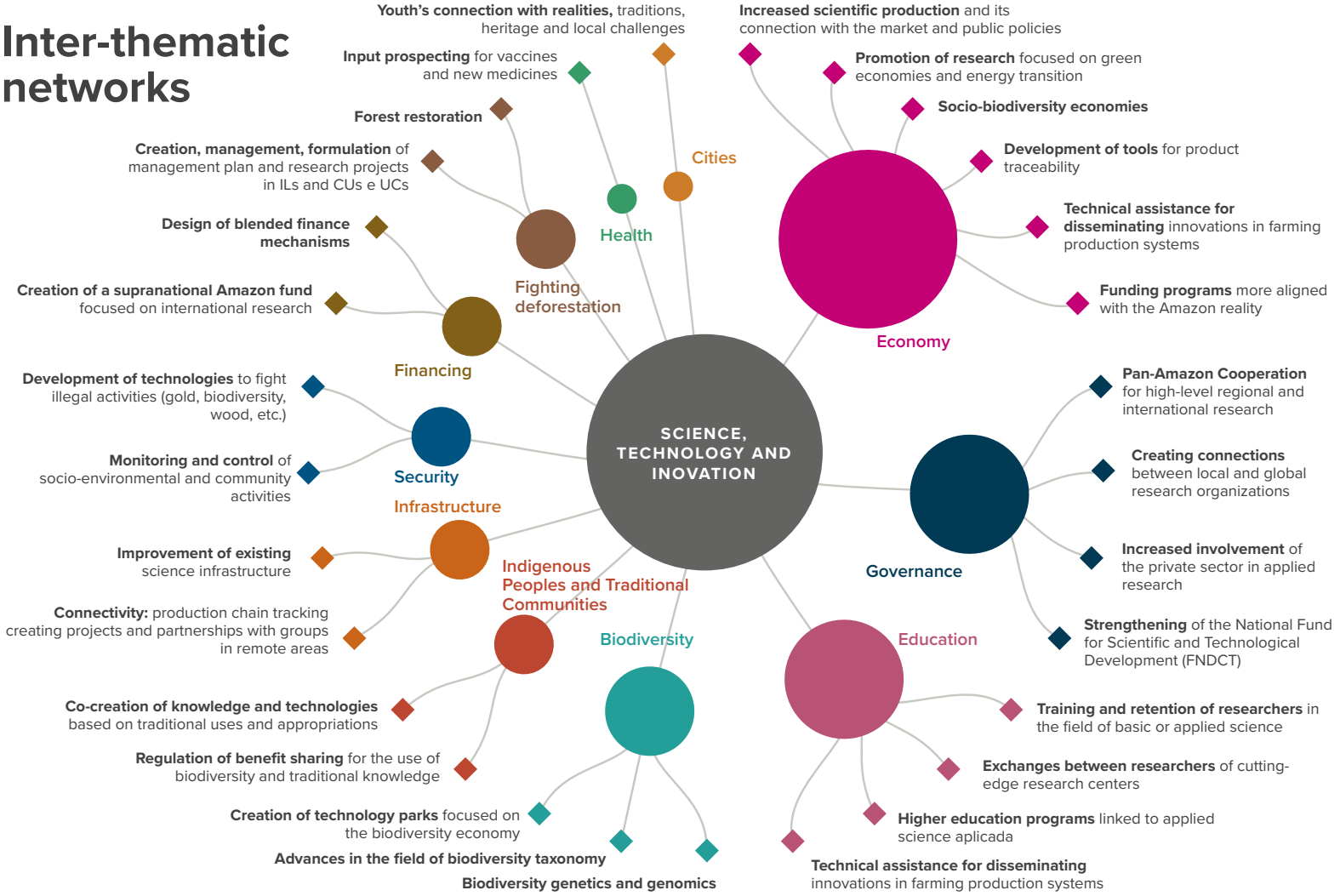
STATE EXPENDITURE ON STI

State expenditures in relation to revenues represent the government's efforts to foster science and technology activities. AMZL had the lowest share of expenditures among the Brazilian regions, 0.75%, in 2019. In terms of evolution in the decade, there was a decrease of 0.12 p.p. between 2009 and 2019.

SOURCE: AMAZÔNIA LEGAL EM DADOS, 2022c.



Inter-thematic networks



Science, technology and innovation (STI) are activities that constitute the foundation for building a more just, sustainable and resilient society. Science is a systematic and organized approach used by various fields of knowledge to understand the world. The application of this knowledge for practical purposes and for creating or improving products and services is linked with a wide range of social, environmental, political and economic themes. The STI agenda has the potential to bring new and creative responses to persistent and emerging social challenges and to generate economic growth.

Brazil faces urgent challenges, such as eradicating hunger, managing the climate emergency, addressing the need for reindustrialization, improving education at all levels, developing health products and services, and building infrastructure and smart (resilient) cities. Meeting these challenges necessarily involves expanding knowledge. Hence the articulation with the science, technology and innovation agenda.

In the Legal Amazon, due to geographic characteristics and to the political-historical and economic development process of the territories, advancing the STI domain is complex. It requires the formulation of strategies that consider, from a broader perspective, the connections and relationships of this field with other themes and issues that emerge from the combination of so many diversities and political contexts.

The STI ecosystem in the Legal Amazon is recognized both for its limitations and for its potential. In terms of limitations, there is little public investment in the sector (MCTI, 2022a,b), little capacity for innovation – reflected by the meager number of registered patents (MCTI, 2021) –, concentration of Institutional Development Plan (PDI) clusters in some regions (Manaus Free Trade Zone and Belém city), and little coordination among State entities and between them and the academia, the private sector, the third sector or grassroots organizations.

In terms of potentialities, the Amazon Forest is the largest tropical forest in the world, it concentrates the richest biodiversity on the planet – still scarcely known –, it stores 25% of global carbon, it is a source of water for agro-industrial activities in South American countries, and it is an invaluable reserve of natural resources for its guardians and for humanity.

Between 2013 and 2022, the Brazilian STI agenda was compromised. In the Amazon as a whole, disinvestment in science was reflected in the degradation of research laboratories, in the departure of qualified professionals from universities, and in the increasing shortage of human resources in the MCTI research units and in other public research centers' staff.

In conserved territories, budget cuts for the sector and political delegitimization of public organizations of the SNCT, in particular INPE[2], affected the execution of public policies for envi-

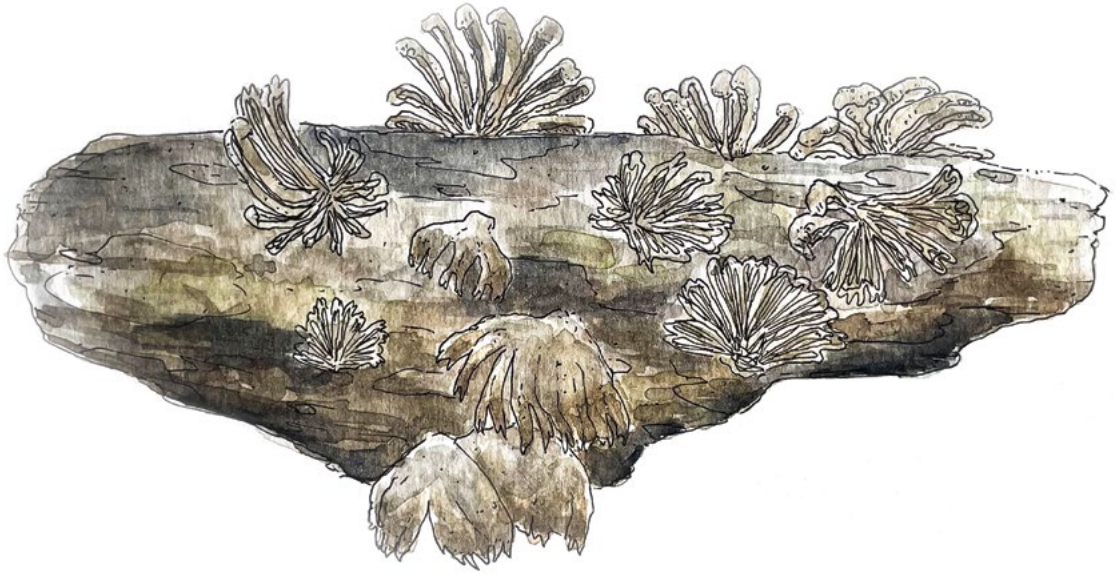
ronmental control and inspection, especially in the Amazon. This deepened public, land, food and nutritional insecurity, especially among traditional populations. In 2021, the deforested area in the Amazon amounted to 13,038 km2, the highest in the last 16 years (INPE, 2022).

According to the scientific literature and surveys led by third sector organizations, indigenous populations and traditional communities have been displaced from their territories due to the advance of illegal mining in indigenous lands, land grabbing, and illegal logging in public lands (INSTITUTO IGARAPÉ, 2022b; WAISBICH *et al,* 2022). In addition, the demobilization of police forces, namely the Federal Police, Ibama and ICMBio, led to an increase in violence and crime rates in rural areas of the northern region, to the abandonment of livelihood activities, and to the contamination of waters by mercury used in mining. This translated into rural exodus and food and nutrition insecurity of indigenous peoples and traditional communities, culminating in the genocide of the Yanomami People in January/ February 2023.

The effects of this weakening of STI in its role of conserving forested areas and promoting public safety and quality of life for vulnerable social groups show how much this sector affects the Amazon biome and the well-being of its original and traditional communities.

In terms of potentialities, the fact that the Amazon Forest is the largest tropical forest in the world, with the richest biodiversity on the planet stands out.

Despite the limitations of the STI agenda, the Legal Amazon has a significant institutional ecosystem, comprising excellent research units linked to the MCTI, development agencies and universities. Among them, institutions that conduct cutting-edge research on the Amazon biome and its populations stand out, such as Museu Paraense Emílio Goeldi, in Belém, Inpa, in Manaus, and Instituto Mamirauá, in Tefé (AM).



Schizophyllum umbrinum

Examples of this genus are widely distributed in terrestrial biomes and play a key role in the degradation of cellulose and lignin of woody plant materials and, therefore, in the cycling of nutrients and maintenance of ecosystems; they have divided lamella; it was essential to find out the sex of the fungi and for crossbreeding strains of S. umbrinum; discovered in 1851, the type locality of the species is in Pará state.

03

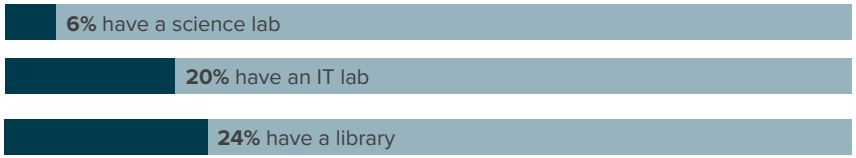
Education

Education in perspectives

The right to education comes necessarily in combination with other social rights, with a view to the full development of the person, his/her preparation for the exercise of citizenship and his/her qualification for work. Education in the Amazon requires political programs and initiatives that respect local particularities and place students and their life projects at the center.

OUT OF 35,438 SCHOOLS IN THE LEGAL AMAZON, ONLY

SOURCE INEP 2018 APUD FAS, IU, 2022.



INVESTMENT PER STUDENT (AVERAGE AMOUNT IN 2019)

SOURCE FNDE/SIOPE, 2019 APUD FAS; IU, 2022..

An education landscape where the Amazônias come together

NATIONAL EDUCATION PLAN

(PNE | 2024-2034)

The New PNE and its respective developments at state and local levels represent an opportunity to build a REGIONAL AMAZON EDUCATION PLAN based on a diagnosis of the local challenges and inequalities, the potential articulation of different social players, and intersectoral solutions.

When analyzed from a sociobiological diversity perspective, education takes root.

LESS THAN **60%**

of the Basic Education schools in Acre, Amazonas, Pará, Roraima and Amapá have access to the Internet

(INEP, 2022).

8.6%

of the students enrolled in EPT (technical and vocational education) in Brazil are in the Legal Amazon, but in that region 16% of people are at the expected age for attending these courses

(INEP, 2020 APUD CRUZ; PORTELLA, 2021).

46% of the education network.

15,708

rural schools were shut down from 2000 to 2018, which accounts for 46% of the school network.

(INEP 2018 APUD FAS; IU, 2022)

LEGAL AND HISTORICAL MILESTONES

1988

Federal Constitution
Estabelece a educação como um direito de todos os cidadãos

1990

ECA | Law 8.069
Acknowledges children and adolescents as subjects with rights

1996

LDB | Law 9.394
Defines and organizes education at all levels, with the purpose of securing the social right to education provided for in the Federal Constitution /1988

2012

Resolution No. 5, of June 22
Defines the guidelines for the indigenous school education

2012

Resolution No. 8, of November 20
Defines the national guidelines for *quilombola* school education

2013

Youth Statute | Law 12.852
Acknowledges the diversities of the youth and their social rights

2017

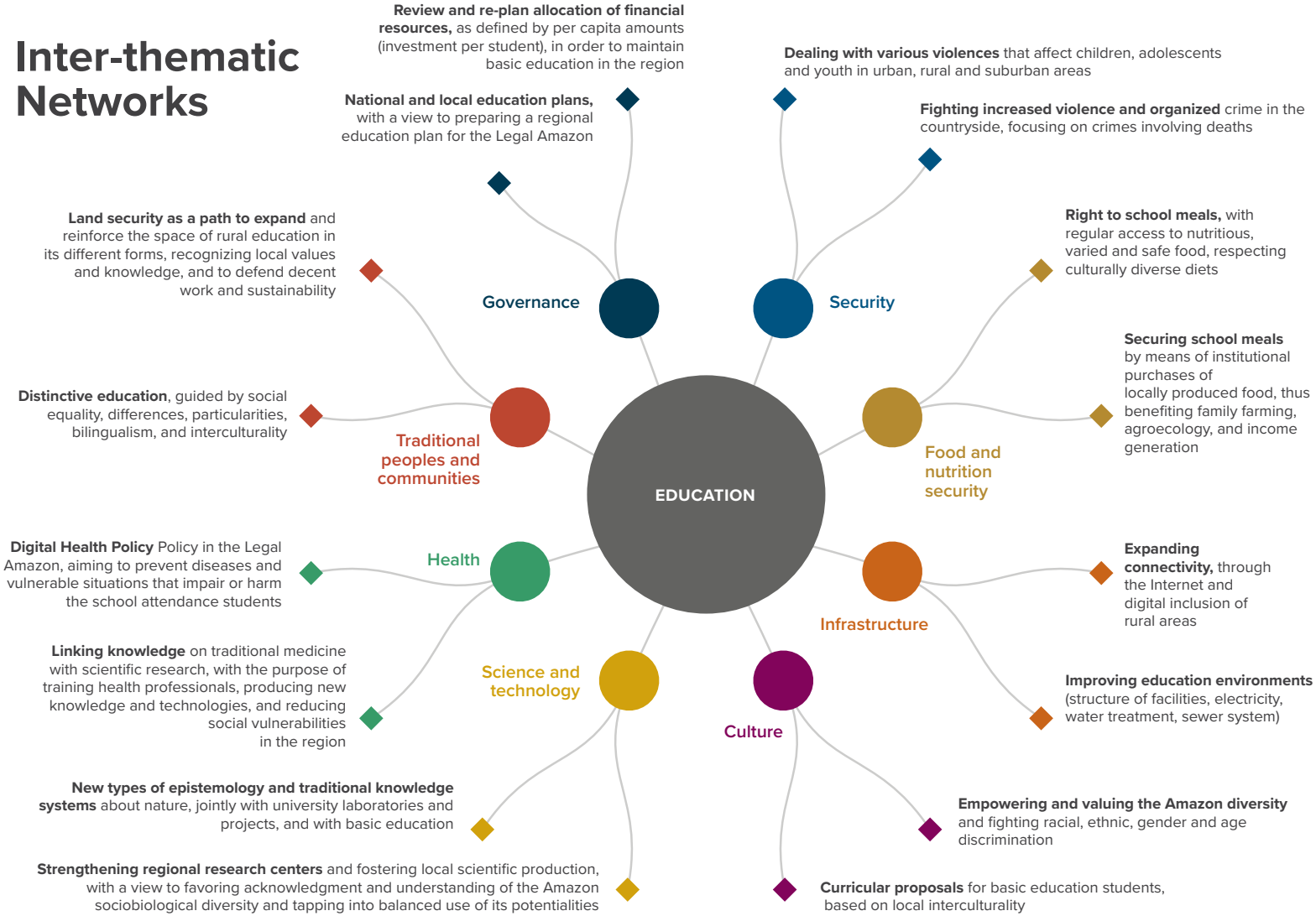
Publication of the Brazilian National Common Core Curriculum (BNCC)
Defines key learning skills in basic education, the principle of which is integral education and centrality of students and their life projects

2023

National Education Forum (FNE) | Ordinance No. 478
Reestablishes the FNE as a space for dialog between civil society and governmental bodies, with the purpose of assessing and restructuring national education policies.

National Digital Education Policy (Law No. 14.533)

Inter-thematic Networks



Article 205 of the Brazilian Federal Constitution (1988) states that education is a right of everyone and a duty of the State and the family. It establishes three inseparable goals: full development of the person, his/her preparation for the exercise of citizenship and his/her qualification for work.

Such encompassing right to education is necessarily intertwined with other social rights, such as security, health and nourishment. Students living under vulnerable conditions face many more challenges to access and experience education and to give it meaning in their lives.

In the field of education, the formulation of public policies requires cooperation between the Federal Government and other federative bodies, guided by the National Education Plan (PNE). The education project that society builds on a consensual basis is translated by the PNE into guidelines, objectives, goals, and strategies. It is incumbent upon the PNE to guide subnational plans at state and local levels and to orient public policies to implement them (BRASIL, 2014).

Law 13.005/14 provides for the PNE for the 2014-2024 decade and defines the authority levels responsible for its monitoring and assessment: Ministry of Education and Culture (MEC); Education Commission of the House of Representatives; Education, Culture and Sports Commission of the Federal Senate; the National Council of Education (CNE); and the National Forum of Education. The Law also sets forth that the Instituto Nacional de Estudos e Pesquisas

Gymnopus montagnei

Usually referred to as “little calla lilies”, the gymnopods are important decomposers of organic matter and play a crucial role in the cycling of nutrients; some species, such as the G. montagnei, have proven anti-inflammatory activity. Found in 1842, this species type locality is in Suriname.

Anísio Teixeira (INEP, Brazil's National Institute for Education Studies and Research) shall conduct and publish biennial studies, in order to measure progress in terms of compliance with established goals.

The overall result of failure to comply with the PNI would likely lead to enhanced education inequalities in the Amazon region. This is more evident when it comes to availability and quality indicators for basic and higher education (Public Hearings held by the Education, Culture and Sports Commission of the Federal Senate – 2023; NATIONAL CAMPAIGN FOR THE RIGHT TO EDUCATION, 2023, INEP, 2023a.)

Data from 2019 point out that the provision of early childhood education is insufficient in the Legal Amazon when compared to other Brazilian states. This rate is 51% for early childhood education in the states of the Legal Amazon vis-à-vis 66.4% in the other Brazilian regions. And for daycare centers, the rate is 25.6% vis-à-vis 44.8% in the rest of Brazil (CRUZ AND PORTELLA, 2021.) The impact of the Covid-19 pandemic was likely even harsher on early childhood education, but no data has been collected for 2020-2023 (INEP, 2023b).

In elementary education, the gross schooling rate for 2020 (offer/population within the age bracket) was nearly 100% in the Amazon (CRUZ AND PORTELLA, 2021, p. 21). However, data on access and quality education released by the 2019 Continuous National Household Sample Survey (Pnad) show that in this region, the school population lags behind since the early years of that schooling stage. The 1- to 2-year gap increases proportionally to the age bracket, certainly leading to school dropout (FAS; IU, 2022). The elementary school access rate is also expected to show a setback in the Amazon for 2022, in tandem with the national trend. Due to the pandemic, rate of schooling for that year is expected to be lower (96.3%) than that of 2014 (97.2%). (NATIONAL CAMPAIGN FOR THE RIGHT TO EDUCATION, 2023.)

For upper secondary education, the gross rate of schooling is on average 72.6%, which is 10 percentage points below the average rate of the other Brazilian states. This stage also faces a highly distorted age-grade rate in the Legal Amazon – the age of 31.2% of the students is above that expected for the grade they are enrolled in. School failure and dropout are two of the reasons for such gap (CRUZ AND PORTELLA, 2022). In the 2012-2021 historical series by region, despite an increase in school access in all regions, it comes with persistent inequalities: in 2021, 80.6% of the 15- to 17-year-old students in the Southeast region were either attending upper secondary education or had completed basic education, whereas in the North region such rate was 68.2%, or a 12.4 p.p. difference (INEP, 2023a). As regards higher education, the Legal Amazon also shows a gross schooling rate (31.7%) lower than that of the rest of the country, where such rate is 40.3% (CRUZ AND PORTELLA, 2021.)

Regarding the presence of basic education schools, 21,919 of them are in rural areas (44% provide early childhood education; 54%, early years of elementary education; 25%, the last years; 4%, upper secondary education; and 10% EJA – Youth and Adult Education). In urban areas, there are 14,519 such schools (19% provide early childhood education; 22%, early years of elementary education and 15% the last years; 8%, upper secondary education; and 8%, EJA). The limited offer of upper secondary education in rural areas is noteworthy, notwithstanding the 23% of the Amazon population who live there (FAS; IU, 2022).

The greatest hindrances to access to education and to remaining in school are precisely in this context, especially the geographic particularity of long distances to be covered, the prevailing river transport, and the seasonal rainfall patterns of floods and drought (the "Amazon factor"). More barriers to access derive from the common practice of shutting down rural schools (especially those providing various grades and having fewer students) and redirecting students to central schools that are not always nearby or connected to their cultural environment. Between 2000 and 2018, 15,708 rural schools were closed in the Amazon region, which accounts for 46% of the public school network (INEP, 2018 apud FAZ; IU, 2022).

It is hard to develop a quality education project under inadequate structural or pedagogical conditions (HAGE, 2014). The supply of education either doesn't meet the demand or operates precariously, for instance having no drinking water, electric power, basic sanitation, or quality Internet access. The use of teaching materials and resources unsuitable to local geographic realities and contexts also contributes to low attendance or to students' switching from rural to urban schools (PEREIRA *et al*., 2022).

The closing of the fourth cycle of the current PNE (2014-2024) and the discussions on the new PNE may be an opportunity for the country to argue and pursue goals and a budget compatible with the Amazon realities. From an intersectoral perspective, when it comes to ongoing public policies, education must have increased visibility. Its absence from the + Sustainable Amazon Plan (MAPA, 2023) should be underlined. Breaking the urban-rural and the traditional-scientific knowledge dichotomies, and overcoming prejudice and inequalities are challenges to be taken on both regionally and intersectorally.

The principles of diversity, sustainability and interculturality are deeply rooted into the education processes of traditional populations. In spite of hurdles and denial of their basic rights, these populations teach their new generations how to live from, in and with the Forest. It is vital to recognize and secure, formally and widely, the rights of these populations, expanding and spreading their knowledge. By so doing, education and its subjects will be placed at the core of discussions on the nature knowledge economy. These populations amass knowledge that may lead to other development perspectives for the Amazon.

The Amazon itineraries

The Amazon region is undoubtedly a crucial territory for Brazil and the world. Not only environmental-wise, but also in its social, economic, historical and cultural aspects.

Therefore, the issues at stake are: are upper secondary education students learning about all this complexity, and are they being challenged to make the Amazon region an integral part of their identities? Do they feel that such a rich context is actually part of their own development and also of the sustainable development of the region?

In order to make sure that the answer is yes, the Amazon Itineraries program seeks to populate the Brazilian curricula with the Amazônias (yes, in the plural, to stress the multiple aspects that make up the territory). This is done by preparing pedagogical content that focus on Amazon topics, issues and references. It also involves ongoing training of educators from partner education networks.

One of the program strengths lies on the unique implementation model within each state education secretariat. Customized curriculum and training of the managing, education and teaching teams have been developed together with each of those secretariats.

Along our path, we can already point out some of the program's early results:

- **Thirteen curricular units** of formative itineraries within the fields of nature sciences, applied human and social sciences, languages, mathematics, life projects, and professional and technological education. **Over 2,600 pages of pedagogical material** have been made available, free of charge, to teaching and educator networks in the whole country.
- **Continuing training directed** teachers, school managers and education assistants within the state school networks that are partners of the Legal Amazon: Acre, Amapá, Amazonas, Maranhão, Mato Grosso, Pará, Roraima and Tocantins.
- **Availability of the entire content** in the program's website, with unrestricted access to any educator or teaching network in the country.

With a view to fostering implementation and pedagogical work with the Amazon Itineraries, Instituto iungo offers continuing training cycles with educators from eight partner networks. The audience includes pedagogical teams and leaders from the state education secretariats and school districts, trainers, teachers and members of school management teams.

Website:
itinerariosamazonicos.org.br

04

Indigenous Peoples and Traditional Communities

An ager

Indigenous Peoples

These are ethnic groups that claim to be descendants of pre-colonial populations. Self-identification of such status is a key factor for establishing their ethnic boundaries. There are 255 different ethnic groups in the Legal Amazon (IBGE, 2010).

SHARE IN THE CENSUS SURVEY

In Brazil, 1,693,535 people (or 0.83% of the total population) self-declared to be indigenous. THE 2022 CENSUS shows an increase of 89% in 12 years (IBGE, 2023).

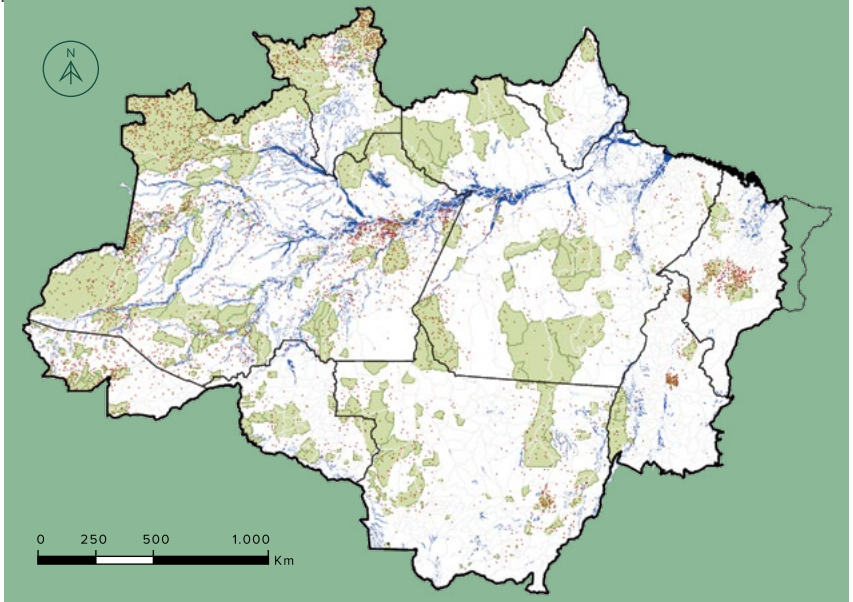
IN THE AMZL THE INDIGENOUS PRESENCE HAS GROWN BY 101%.

SOURCE: IBGE CENSUS 1991, 2000, 2010, 2022

INCREASE IN SELF-IDENTIFICATION

The fast growth of the indigenous population cannot be explained by the vegetative growth or as a result of migrations; it should rather be analyzed through an ethnic dynamics – people who previously did not identify themselves as indigenous are now doing so – and through the recent renaissance of collective identity affirmative action of peoples who would otherwise be extinct.

LOCATIONS AND INDIGENOUS LANDS



CAPTION

INDIGENOUS LOCATIONS (1 POINT = 1 LOCATION)
INDIGENOUS LANDS
HIYROGRAPHY
MUNICIPALITIES
LEGAL AMAZON

TOMÁS PAOLIELLO, 2020. SOURCE: MMA (2020), INCRA (2020), IBGE (2020)

THE TIs ARE AMONG THE MAIN BARRIERS AGAINST CLIMBING DEFORESTATION IN BRAZIL. In the last 30 years, the indigenous lands have lost just 1% of their native vegetation area, whereas in private lands the loss has amounted to 20.6% (MAPBIOMAS, 2022).

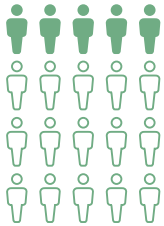
TIs STRETCH OVER
13.9% of the Brazilian area

CONTAIN
109.7 million
hectares of native vegetation

WHICH ACCOUNTS FOR
19.5% of the native vegetation in Brazil in 2020 (MAPBIOMAS, 2022).

98.3%
OF THE TERRITORIES considered officially indigenous (TIs) in Brazil are in the Amazon (ISA, 2020).

51%
OR 867.9 THOUSAND INDIGENOUS INDIVIDUALS live in the Legal Amazon (IBGE, 2023).



25%
OF THE INDIGENOUS POPULATION IN THE AMAZON is outside the TIs and, therefore, do not enjoy their rights (IBGE, 2020).

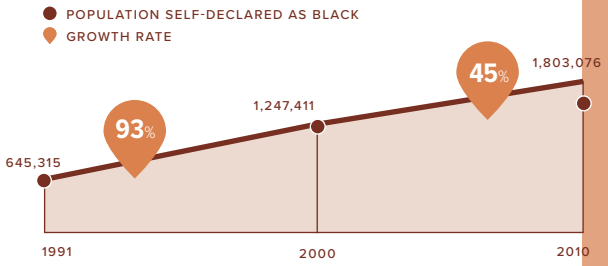
Quilombola Communities

The recent emergence of the *quilombola* identity stems from self-identification of these social agents and by their organizational and political capability. Identity may be activated by ecological criteria, by land conflicts, or by the communal use of natural resources.

POPULATION SELF-DECLARED AS BLACK IN THE CENSUS SURVEY

Similarly to indigenous peoples, self-declaration of the black population has been increasing in the Legal Amazon, in tandem with ethnic and identity empowerment.

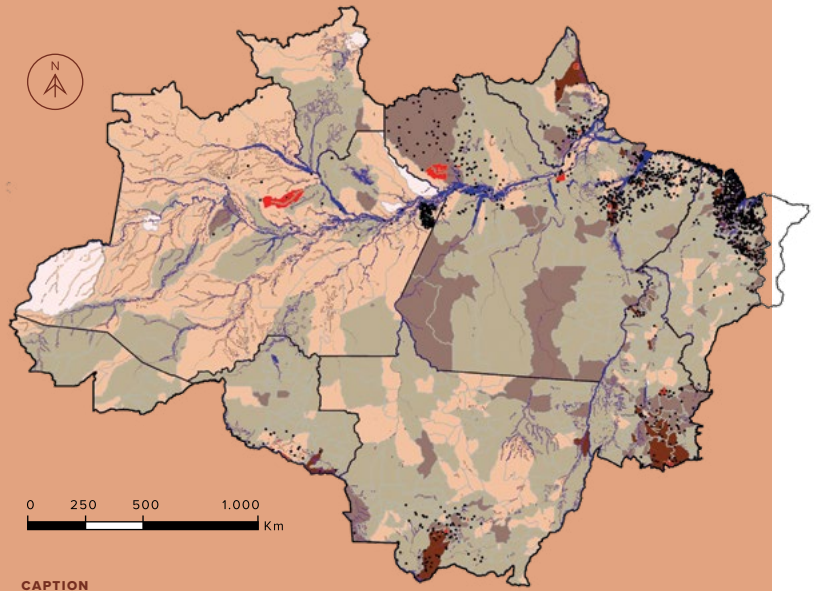
BRAZILIAN CENSUS, IBGE (2010).



1,327,802

OR 0.65% OF THE TOTAL POPULATION is the number of people who self-declare as quilombolas in Brazil (IBGE, 2023).

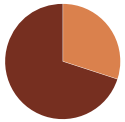
QUILOMBOLA LOCATIONS AND AREAS BY MUNICIPALITY IN THE LEGAL AMAZON – 2020



TOMAS PAOLIELLO, 2020. SOURCE: IBGE (2020) E INCRA (2020) / IBGE, 2020.

BLACK AMAZON

The presence of *quilombolas* in contemporary Amazon is very meaningful, despite being absent from the collective imaginary of the forest. This results from a process that occurred in the 16th, 17th, and 18th centuries, when 142,231 enslaved people disembarked in the Amazon coming from the African continent (SLAVE VOYAGES, 2009). The unprecedented and historic picture displayed by the 2022 CENSUS shows that 32.1% of the *quilombola* people in Brazil are in the AMZL (IBGE, 2023).



NEARLY **40%** **OF THE TOTAL BRAZILIAN** certified remaining communities from *quilombos* are in the Amazon (FCP, 2023).

1,737 ***QUILOMBOLA* LOCATIONS** have been identified in the Legal Amazon IBGE (2020).

ONLY **32%** **OF THE *QUILOMBOLA* COMMUNITIES** certified by the Fundação Palmares in the Amazon (1,304 in the total) had their land tenure cases started by Incra and just 11% have the ownership of their traditional territories (FCP, 2023).

Traditional Communities – Collective Subjects

These are mobilization units in which territoriality works as an identification, defense and strength factor: bonds based on solidarity and mutual help entail a set of rules established on a physical location regarded as communal, crucial and inalienable (ALMEIDA, 2004).

SHARE OF THESE POPULATIONS IN THE LEGAL AMAZON

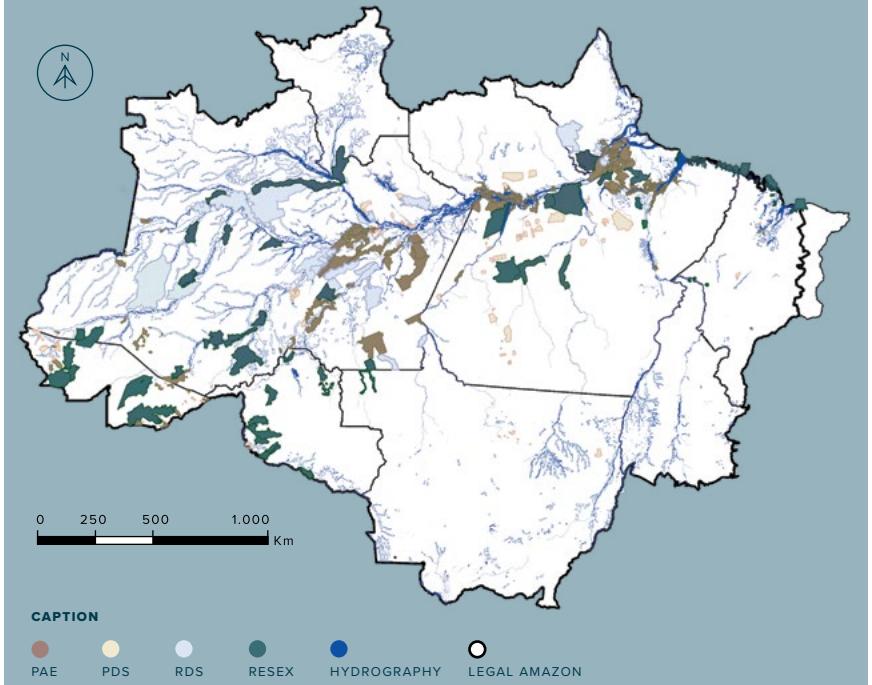
RUBBER TAPPERS
Movement created in the 1980s as a strategy to resist to violent territorial dynamics against rural lifestyles and land-related issues

"BABAÇU FEMALE CRACKERS"
It is estimated that 400 thousand people are related to babaçu-related extractive activities (MIQCB, 2023)

RIVERINE PEOPLE
In the huge river systems and in the large coastal area capture fishing supplies food and income to indigenous, riverside, extractive-related people, *quilombolas*, or to exclusively fishermen/women conducting this activity, mustering specific efforts and knowledge.

TRADITIONAL APPROACHES are not necessarily opposed to modern ones. They do not mean underdevelopment, they are not a remainder, but rather an operational category used by the State to understand concrete situations.

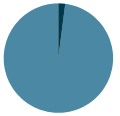
Extractive Reserves (RESEX), Sustainable Development Reserves (RDS), Agro-extractive Settlemens Projects (PAE) and Sustainable Development Projects (PDS)



TOMAS PAOLIELLO, 2020, SCG SIRGAS 2000, MMA (2020), INCRA (2020), IBGE (2020)

1,500,000 **IS THE ESTIMATED NUMBER** of people benefited by the Resex and RDSs in2009 (MEMORIAL CHICO MENDES, 2009).

DYNAMIC IDENTITIES The same social agents may join more than one social movement and take more than one of these multiple and dynamic identities. In the Amazon, these collective subjects encompass a huge social and cultural diversity, and identity policies and movements.



6.6% **(34,383,053 HA)** of the AMZL are assigned by the State to Resex (Extractive Reserves), RDSs (Sustainable Development Reserves), Agro-extractive Settlement Projects (PAE), and to Sustainable Development Projects (PDS), demarcated by the INCRA (MMA, 2020; INCRA, 2020; IBGE, 2020).

50 **PRODUCTS** of extractive-related activities - especially firewood, açaí, Brazil nut. babaçu, buriti and cupuaçu - have been identified in 655 out of the 772 AMZL municipalities. (IBGE, 2017).

26 **MILLION** ha or 4.8 % of the Legal Amazon,especially in MA, PA, PI and TO, is the estimated area where the babaçu tree is found (ALMEIDA, 2019).

Legal and historical milestones

The Amazon Forest is not just a vital ecosystem, it is also home to various peoples and traditional groups with deeply rooted histories. In the last 35 years, these groups have reached significant milestones in their search for stewardship and preservation of their cultural heritage and local biodiversity.

1872

1ST BRAZILIAN GENERAL CENSUS
Indigenous peoples were estimated to represent 3.8% of the total population, nearly 400,000 individuals. The Amazonas province concentrated 63.9% of this population.

1910

SPILTN
Creation of the Indigenous Protection and National Worker Localization Service

1940

SLAUGHTER
of Krahó indigenous peoples in Goiás (currently Tocantins)

1973

INDIAN STATUTE
The Indigenous Statute comes into force - Brazilian Law No. 6.001, which sets forth the relations of the State and society with the indigenous peoples.

1978

MNU
Creation of the Unified Black Movement

1985

CNS
Foundation of the National Council of Rubber Tappers (CNS) at the 1st National Meeting of Rubber Tappers, in October 1985, in Brasília. In 2009, the CNS became the National Council of Extractive Populations

RESEX
Creation of Extractive Reserves, conservation units that allow local communities that rely on these resources for their work and subsistence to conduct extractive activities

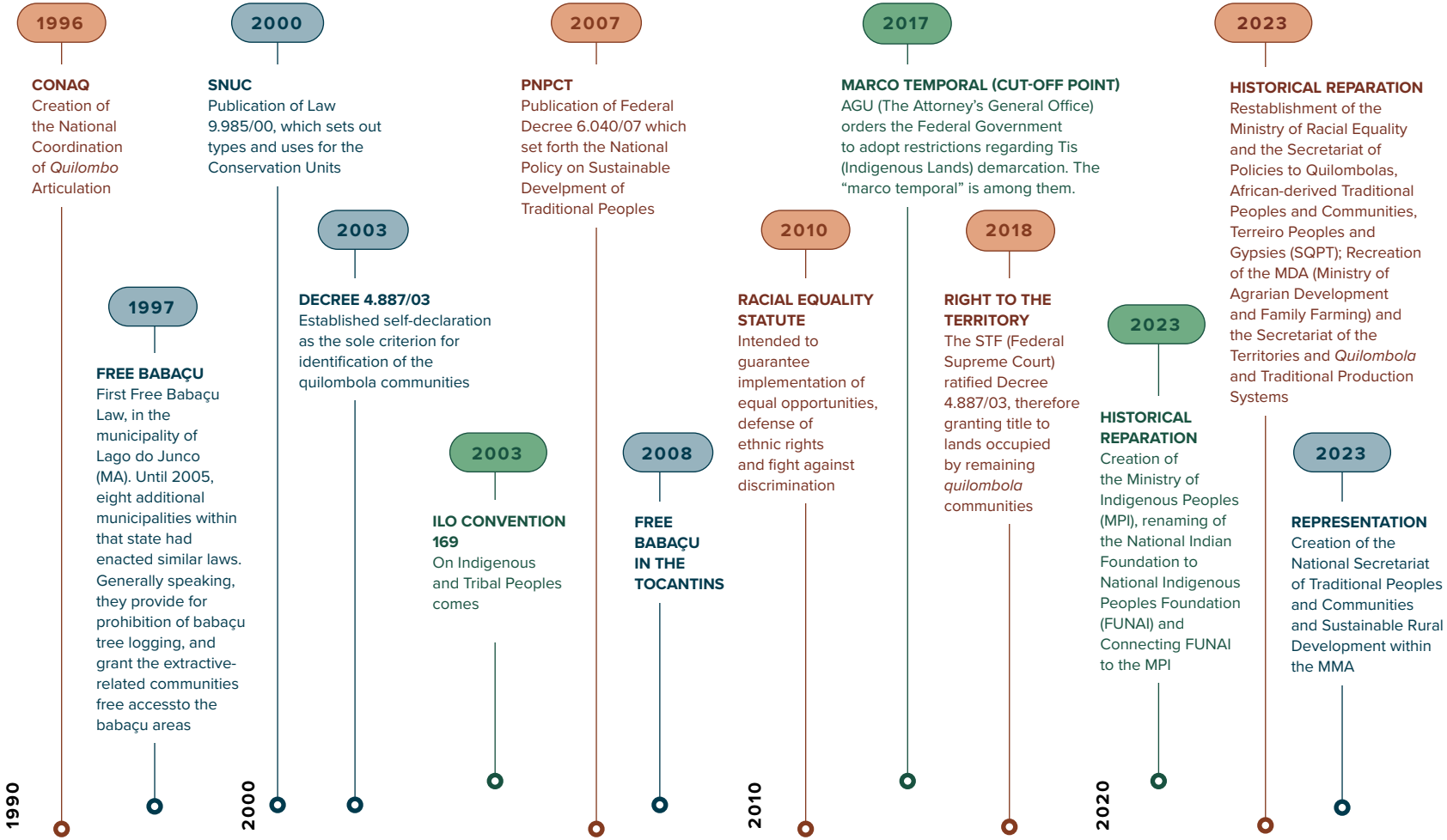
1988

CITIZEN CONSTITUTION
Acknowledges the right of indigenous peoples to have their own forms of organization and full legal capability

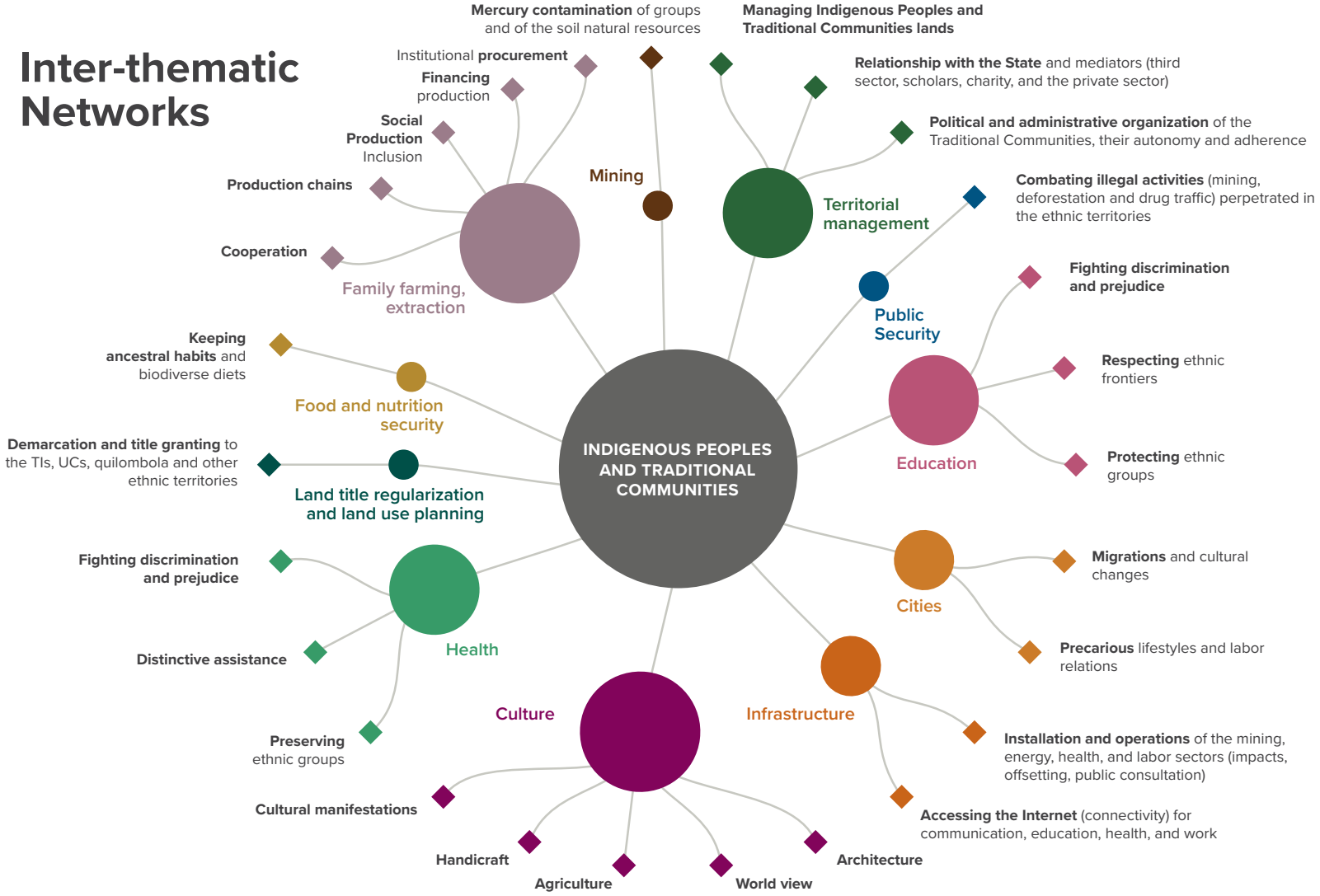
CITIZEN CONSTITUTION
For the first time, the rights of black communities are established, in contrast with colonial legal concepts that defined quilombos as objects of persecution

1989

COIAB
Indigenous leaders from the Brazilian Amazon create the Coordination of the Indigenous Organizations of the Brazilian Amazon


1990
1996
CONAQ
Creation of the National Coordination of *Quilombo* Articulation
1997
FREE BABAÇU
First Free Babaçu Law, in the municipality of Lago do Junco (MA). Until 2005, eight additional municipalities within that state had enacted similar laws. Generally speaking, they provide for prohibition of babaçu tree logging, and grant the extractive-related communities free accessto the babaçu areas
2000
2000
SNUC
Publication of Law 9.985/00, which sets out types and uses for the Conservation Units
2003
DECREE 4.887/03
Established self-declaration as the sole criterion for identification of the quilombola communities
2003
ILO CONVENTION 169
On Indigenous and Tribal Peoples comes
2007
PNPCT
Publication of Federal Decree 6.040/07 which set forth the National Policy on Sustainable Develpment of Traditional Peoples
2008
FREE BABAÇU IN THE TOCANTINS
2010
2010
RACIAL EQUALITY STATUTE
Intended to guarantee implementation of equal opportunities, defense of ethnic rights and fight against discrimination
2017
MARCO TEMPORAL (CUT-OFF POINT)
AGU (The Attorney's General Office) orders the Federal Government to adopt restrictions regarding Tis (Indigenous Lands) demarcation. The "marco temporal" is among them.
2018
RIGHT TO THE TERRITORY
The STF (Federal Supreme Court) ratified Decree 4.887/03, therefore granting title to lands occupied by remaining *quilombola* communities
2020
2023
HISTORICAL REPARATION
Creation of the Ministry of Indigenous Peoples (MPI), renaming of the National Indian Foundation to National Indigenous Peoples Foundation (FUNAI) and Connecting FUNAI to the MPI
2023
HISTORICAL REPARATION
Restablishment of the Ministry of Racial Equality and the Secretariat of Policies to Quilombolas, African-derived Traditional Peoples and Communities, Terreiro Peoples and Gypsies (SQPT); Recreation of the MDA (Ministry of Agrarian Development and Family Farming) and the Secretariat of the Territories and *Quilombola* and Traditional Production Systems
2023
REPRESENTATION
Creation of the National Secretariat of Traditional Peoples and Communities and Sustainable Rural Development within the MMA

Inter-thematic Networks



The hegemonic view of the Amazon defines it as a region naturally characterized by the prevalence of the forest (and its devastation) and by a massive presence of indigenous and traditional peoples (and their population decline). Recent data (IBGE, 2021) show that in contemporary Amazon, a little over half of its 30 million inhabitants live in large or medium cities. However, roughly 45% of the Amazon people are in rural areas or in small towns, where the social dynamics is strongly marked by rural qualities. These figures indicate, quite precisely, the location of populations[3], and their status vis-à-vis the urban/rural spaces. Yet, these data do not disclose their sense of identity - a piece of information much harder to be gathered and quantified.

Phallus indusiatus

Uniquely beautiful, this species has a central stem with a veil-like mesh; its odor attracts insects; scattered in several countries, they are edible, rich in proteins, carbohydrates and fibers; they have bioactive compounds, some of which with antioxidant and antimicrobial properties; studies show its importance to Chinese medicine. Found in 1798, the type locality of this species is in Suriname.

Such difficulty stems mostly from the complex ethnic-identity development of Brazil and, more specifically, of the Amazon. This analysis must not underestimate historical facts occurred in the last centuries. Some of these facts are the colonial wars, the "peak" of the rubber cycle, extensive colonization projects based on infrastructure implementation and mass immigration in the 20th century, and the "renaissance" of ethnic groups during the last 50 years.

In order to understand such long ethnic dynamics, it is important to understand the social processes that constantly (re) demarcate the ethnic boundaries of this population. Political contexts, conflict situations and land issues drive such processes. For example, for centuries declaring an indigenous or *quilombola* identity exposed those social groups to strong, blatant discrimination or even to overt war; more recently, the admission of such identities has been bringing with it the recognition of a number of rights by the State. If for decades, traditional communities were considered as having a regional identity basis - a folklorist and evolutionist perspective -, today these very communities are self-identifying politically, and their greatest strength is a genuine desire of ensuring the continuity of their ways of life.

The indigenous peoples are ethnic groups that claim to be descendants of pre-colonial populations. Self-assignment is a key factor in determining their ethnic boundaries. In the Legal Amazon, there are 255 different ethnic groups (IBGE, 2010), a huge ethnic variety that indicates the presence of many distinctive ways of life among the Amazon indigenous peoples. These are groups with different origins and trajectories, who interact with society at large in different ways. Their cultural manifestations, world views, languages, social organizations, types of dwelling and diets are specific and may be claimed as part of their identities.

These experiences and knowledge systems do not prevent indigenous peoples - just like with any other social group - from permanently updating these cultural patterns. In this regard, while preserving their ethnic boundaries, they can also adopt other habits, customs, knowledge and techniques. The widespread images of indigenous peoples, depicted in consonance with the narratives from centuries past - have been and still are one of the main traits of a colonial perspective deeply rooted in our society and our mindsets. Clinging to such perspective adds to the difficulties faced by these peoples in having their rights recognized and enforced. Those who currently claim to be descendants of native peoples are Brazilian citizens, contemporaries of everyone in Brazilian society.

Regarding territoriality, there are two separate situations involving indigenous peoples in the Legal Amazon: the 75% who are located inside recognized indigenous lands, and the 25%

who have not yet gained such right (IBGE, 2010). Indigenous peoples deprived of their rights experience very different situations. Within this group, 23% live in the 20 cities of the Legal Amazon with more than 100 thousand inhabitants. Even in such largely urban environment, many claims for rights recognition have been taking place. Manaus is an emblematic example, with a strong, active indigenous movement. In state capitals and large cities of the Amazon, indigenous presence in poorer areas is fairly common (MAPA DE CONFLITOS, 2023).

Besides being the region with the largest number of demarcated lands (58.6% of the country's), holding most of Brazil's demarcated surface area, the Amazon also has the highest percentage of self-identified indigenous peoples living in indigenous lands (75%.) In the rest of the country, 58.6% of the indigenous peoples live outside indigenous lands. These data confirm how old the struggle for identity and territory recognition has been in the Amazon. It also reveals greater concern of society for the indigenous peoples in these spaces. One additional important piece of information for analyzing this topic is that demarcation of indigenous lands in the Amazon has a twofold function: the "original" one, i.e., allocating indigenous territories to their peoples, and the other one, preserving the forest.

The contemporary emergence of the *quilombola* identity is anchored on the self-identification of those very social agents and on their political and organizational ability. This self-identification may be elicited by ecological criteria or basic resource conservation, as well as land conflicts, and communal use of natural resources. The 1988 Constitution was a fundamental milestone for the *quilombola* issue in Brasil. For the first time, the rights of black communities were established, as opposed to colonial legal concepts that demarcated the *quilombos* as persecution and war

> In the Legal Amazon there are 255 different ethnic groups, a huge ethnic variety that indicates the presence of many distinctive ways of life among the Amazon indigenous peoples. (IBGE, 2010)

objects. These old definitions seem to be frozen in time, leading to the current serious difficulty in understanding what the *quilombola* communities actually are.

Despite not being a very well-known population group when one thinks of contemporary Amazon, the presence of *quilombola* communities in the region is quite significant. For three centuries, 142,231 enslaved people disembarked in the Amazon coming from the African continent (SLAVE VOYAGES, 2009). In 1872, the Maranhão province ranked third in Brazil in terms of enslaved population percentage: 21.1%, or nearly 80 thousand people. In Pará and Mato Grosso, more than 10% of the population (over 34 thousand people) was enslaved (IBGE).

Both regionally and locally, the *quilombola* communities identify themselves in various ways, such as rural black communities, black lands, terras de santo (saint lands), terreiro people, and *mocambo* (PVN, 2002.) This territorial and identity diversity reflects different dynamics and historical paths treaded.

The normative instrument regulating recognition of the *quilombola* communities by the Brazilian State was Federal Decree 4.887/03. It set forth that self-identification as *quilombola* was the only required criterion for a person's identification as such: "For the purpose of this Decree, descendants of *quilombola* communities are those ethnic and racial groups, according to self-identification criteria, that hold a past trajectory of their own, having specific territorial relationships, with presumably black ancestry connected to resistance to the historical oppression suffered."

In spite of this institutional framework, out of the 1,304 communities in the Amazon who declare themselves as *quilombolas* and which have been certified by the Palmares Foundation[4], just 413 had their land tenure claims filed by Incra. And only 144 took ownership of their traditional territories. The magnitude of such a repressed demand evidences the current context of enormous difficulties in land title regularization of these ethnic lands, not only in the Amazon, but throughout the country. This situation discloses the dramatic territorial insecurity to which the *quilombola* communities are subject. Land title regularization of traditional territories is crucial to these communities, as their ways of life and work depend on it.

A relatively common phenomenon is the migration of these rural communities to big cities, as a result of historical processes of violence and territorial insecurity. However, in the cities the vulnerability of this population is often higher than in rural areas. More often than not, in urban contexts the *quilombola* populations live in the outskirts of cities, in favela slums or in shantytowns, where living conditions are precarious and public services are poor or inexistent. Lastly, the violent dynamics of security policies in most of these urban spaces view young black people as their main enemies. This gives rise to murders, imprisonments,

and a powerful process of exclusion and criminalization of this social group.

Traditional communities are mobilization units in which territoriality works as a factor for identification, defense and strength. Bonds based on solidarity and mutual support translate into a set of rules established on a physical basis regarded as communal, crucial and inalienable (Almeida, 2004). These are territories where the control of basic resources is not exercised individually by a certain household group or by one of its members. These mobilizations are also underpinned by the repertoire of specific knowledge systems typical of their local realities. These traditions are not necessarily opposed to modern ones; they do not mean underdevelopment, they are not a vestige, nor are they a remainder, but rather a new operational category used by the State apparatus to understand concrete situations.

Therefore, it is important to understand that these same social agents may join more than one social movement and take on more than one of these multiple and dynamic identities. They are collective subjects organized into an immense social, cultural and political diversity of identities and movements. In terms of official data, one of the most significant ones regards the areas allocated by the State to extractive populations or activities. At present, in addition to Extractive Reserves (Resex) and Sustainable Development Reserves (RDS) - integral parts of the National System of

Marasmius yanomami

Rhizomorphs are known to be used by birds in their nestles. Rhizomorphs of *M. yanomami* are used by Yanomami women in basket ornamentation. Found in 2019, this species type is typically located in the Amazon.

Conservation Units (SNUC) -, Agro-extractive Settlement Projects (PAE) and sustainable development projects (PDS) are also demarcated by Incra. In total, these areas account for 6.59% of the Legal Amazon, or 34,383,053 hectares. In 2009, the Resex and the RDS alone benefited 1.5 million people.

The spatial distribution of traditional communities is associated with greater forest and vegetation cover preservation, as expected, because by definition extractive activities require such a condition. Suffering on their specific local scales due to the advance of deforestation, environmental degradation and large es-

Marasmius amazonicus

This species was first collected in the Amazon by a German scientist; however, the samples stored in an herbarium were lost during World War II; In 2009, new representative species were obtained once again; of purple color and having small yellow stains, they are popularly known as “starry night”; they are decomposers that develop in dead plant matter, at high humidity. Found in 1904, the type locality of this species is in Amazonas state.

tates, communities and traditional peoples seek to build their resistance through political and ethnic organization. In this regard, a myriad of identities can be found connected to different territorial patterns, extractive activities and products. Some of them are firewood, açaí, Brazil nut, babaçu ("almond" and "coconut"), *buriti*, *bacaba*, *pequi*, *tucumã* and *cupuaçu*.

Another direct association with the geographic distribution of extractivist communities is the extensive Amazon hydrographic network. Riverine communities are also extractivist groups. During the colonization process in the region, this was a generic identity assigned to non-indigenous peoples living near the rivers and lakes. Their distinctive features changed over time and with the advance of colonization. As more spaces were conquered by indigenous peoples, populations living close to rivers began to be named riverine people. It is important to note that the definition of riverine peoples derived from the existing image of an indigenous person in each given period.

Since the 1980s, other ethnic identities have also sought to establish themselves to society as traditional peoples and communities. The trigger for these processes has been primarily territorial dynamics quite adverse to these groups. As a result, in being violently threatened in their ways of life and territoriality, these collective subjects organized themselves to resist.

Among the wide range of extractive activities in the Legal Amazon, besides the already mentioned rubber tapper example, the babaçu coconut female crackers, fairly widespread, represent another outstanding collective identity. The babaçu palm tree is found virtually in the entire Maranhão state and in portions of Pará, Tocantins, and Piauí. The babaçu areas stretch over 18.5 million hectares, or 3.54% of the Legal Amazon. Representatives of this group estimate that some 400 thousand people are involved in babaçu extractive activities.

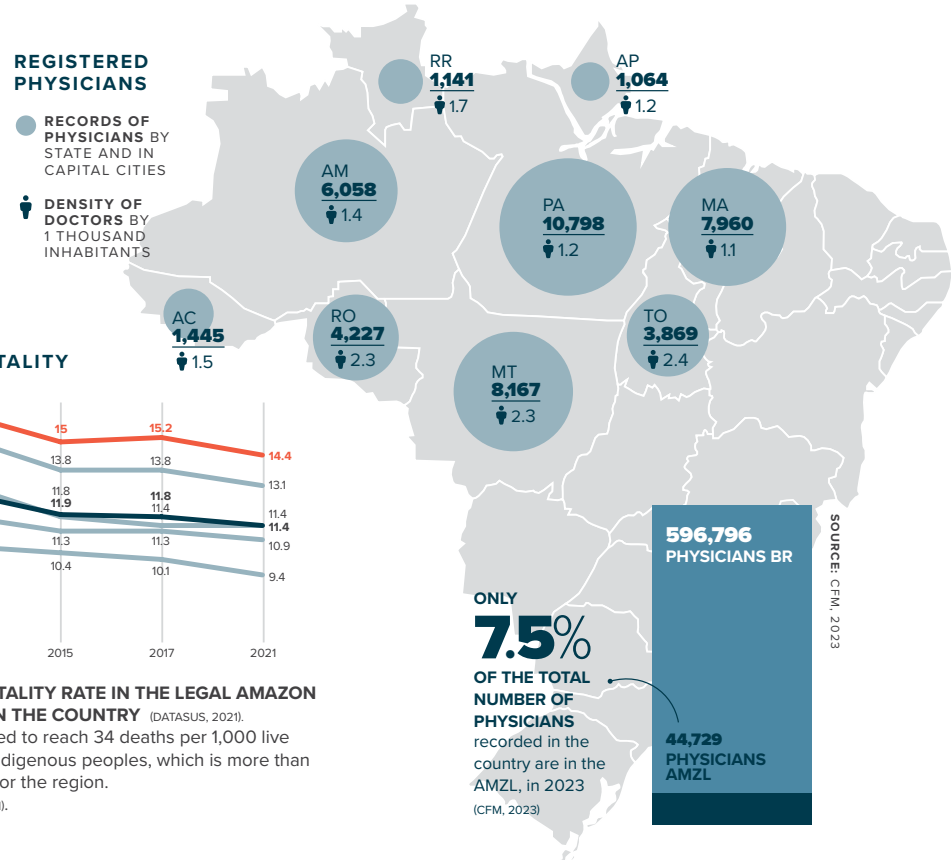
Another major activity in the Amazon is fishing. Both in its huge river networks and in the large coastal area, capture fishing supplies food and income to many traditional communities and peoples. Whether indigenous, riverine, extractivist people, *quilombolas*, or just fishermen/women carrying out capture fishing, this activity musters very specific types of effort and knowledge. Knowledge of the innumerable particularities of the different water bodies, currents, tides, and the countless animal variety that inhabits such spaces, as well as the shared uses of resources, outline these peculiar traditional identities. The use and construction of canoes and boats, and of wide variety of fishing instruments reinforce the qualification of these collective subjects. As with other traditional identities, these communities often mobilize to claim ethnic and territorial recognition when facing situations of conflict or threats.

05

Health

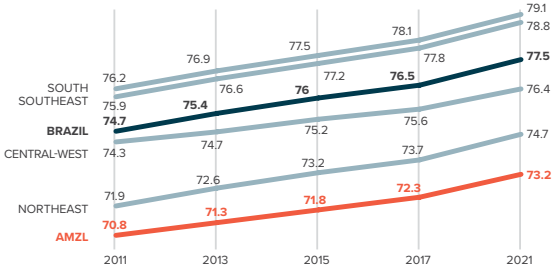
Focus on health

The operation of the public health system in the AMZL is restricted and requires customization, since a number of historical, economic, social and cultural factors make this region different from the rest of the country, therefore calling for distinct operational and logistic structures, and care strategies (the “Amazon factor”.)



LIFE EXPECTANCY

IBGE, 2021

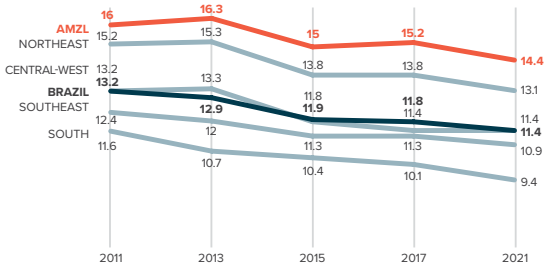


LIFE EXPECTANCY INCREASES AT A SLOWER PACE IN THE AMAZON REGION due to an expressive mortality rate among the elderly and to youth and adult mortality resulting from high rates of violence and motorcycle accidents

(SOURCE: ROCHA *et al*, 2021).

INFANT MORTALITY

DATA SUS, 2021



THE INFANT MORTALITY RATE IN THE LEGAL AMAZON IS THE HIGHEST IN THE COUNTRY (DATASUS, 2021). This rate is estimated to reach 34 deaths per 1,000 live births among the indigenous peoples, which is more than twice the average for the region.

(SOURCE: ROCHA *et al*, 2021).

LEGAL AND HISTORICAL MILESTONES

1988

SUS
Publication of the Citizen Constitution which creates the SUS

1990

CREATION OF THE SASISUS
Indigenous Peoples Health Care System as a SUS subsystem

2010

PUBLICATION OF ORDINANCE MS 2191, which establishes criteria for implementation, funding and continuing health care to riverside populations

2011

CREATION OF THE NATIONAL POLICIES on Integral Health of the Rural, Water and Forest Populations (PNSIPCF)

2013

LAUNCHING OF THE *MAIS MÉDICOS* (MORE DOCTORS) PROGRAM

2017

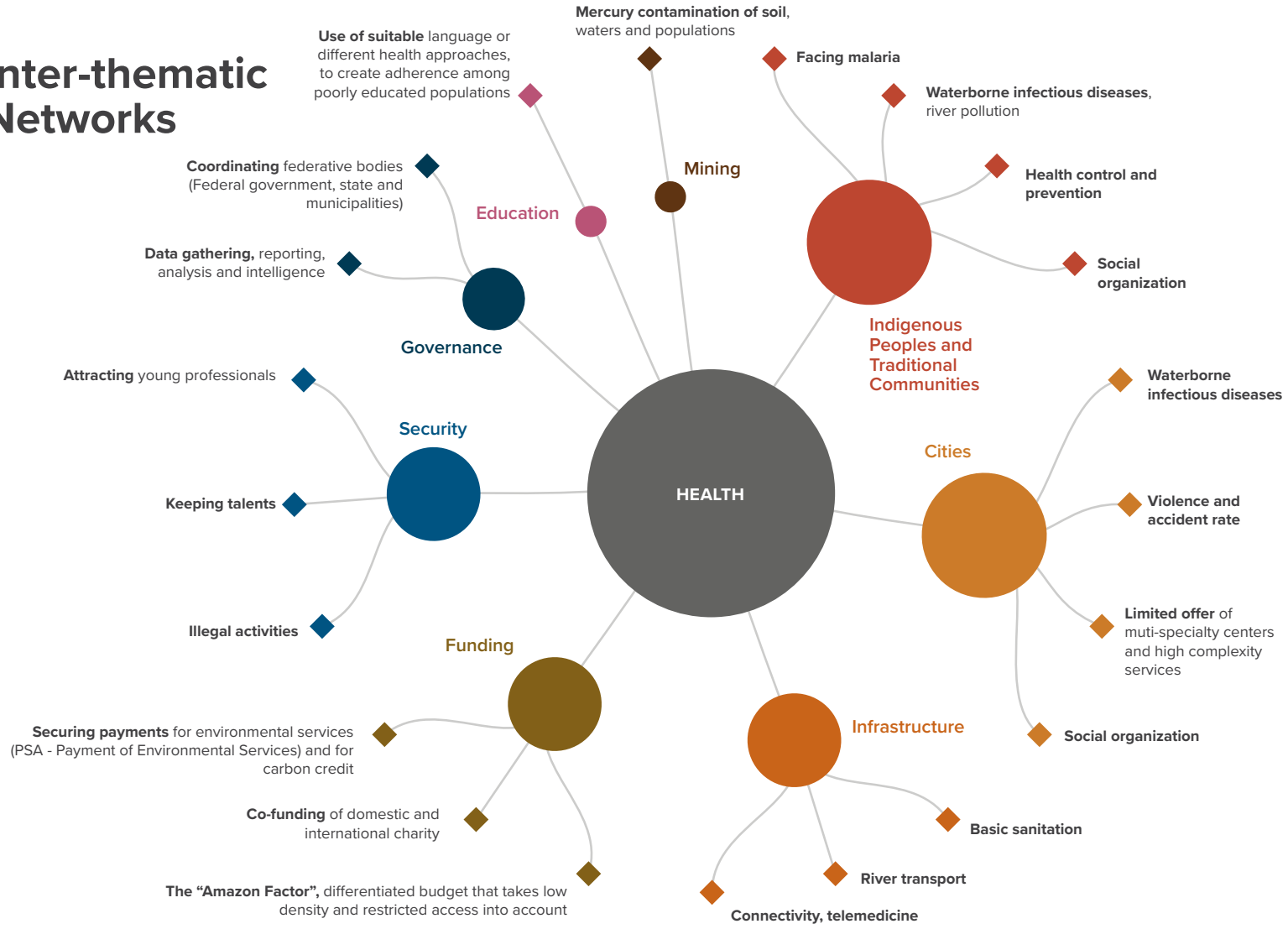
PUBLICATION OF THE NATIONAL POLICY FOR PRIMARY HEALTH CARE (PNAB), which describes all processes and obligations at all health managerial levels

2023

YANOMAMI HEALTH CRISI

WEIBE TAPEBA takes office of the Special Indigenous Health Secretariat (SESAI), which is connected to the Ministry of Health. The *Mais Médicos* program and the National Health Conference are resumed, and the Brazilian Federal Telemedicine Law is passed

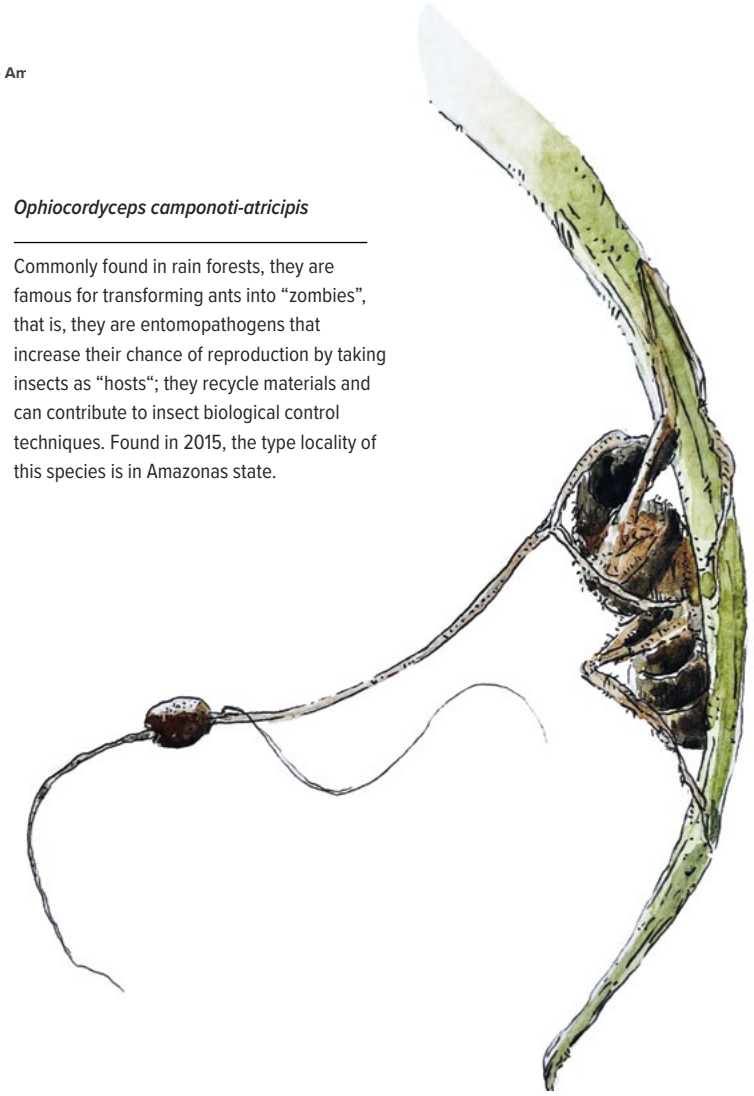
Inter-thematic Networks



In 1946, the World Health Organization (WHO) defined health as a state of complete physical, mental and social well-being, and not merely the absence of illness. Such definition brings this topic closer to the concept of quality of life. In Brazil, access to health has been acknowledged as a universal right since 1988, following the enactment of the Citizen Constitution. Paraphrasing its section 196, "Health is a right of all and a duty of the State and shall be guaranteed by means of social and economic policies aimed at reducing the risk of illness and other hazards and at the universal and equal access to actions and services for its promotion, protection and recovery." In order to make such right operational, the Federal Government established the Unified Health System (Law 8.080/90), popularly known as SUS, in 1990.

SUS is a public and free-of-charge healthcare system that provides universal access to health services, with no discrimination. It encompasses both primary care and specific, complex care, focusing on combining health and quality of life. It aims at disease prevention and health promotion, and it includes other sectors that may have an impact on health. SUS is underpinned by three principles: universality, equity and integrality. Equity is the commitment to reducing inequalities, i.e., treating different individuals differently in order to provide equal treatment. Integrality means each person is seen as a whole (MS, 2023).

Despite its legal intent, 33 years after its introduction, SUS



Ophiocordyceps camponoti-atricipis

Commonly found in rain forests, they are famous for transforming ants into "zombies", that is, they are entomopathogens that increase their chance of reproduction by taking insects as "hosts"; they recycle materials and can contribute to insect biological control techniques. Found in 2015, the type locality of this species is in Amazonas state.

services in Brazil are still unequal. When the system's operations in the Legal Amazon are examined, it becomes evident that its implementation is still restricted and thus calls for supplementary action. A number of historical, economic, cultural, and financial factors, in addition to challenges posed by diversity, characterize this region and make it different from the rest of Brazil in terms of demand for operational and logistics infrastructure and care network. In the North region states, the access to health is still limited. Out of 564,385 registered physicians in Brazil in 2023, only 2.8% (15,790) are in the Legal Amazon (CFM, 2023).

On top of difficulties in accessing health services, there are several hindrances to incorporating the cultural traits of Amazon peoples into health policies. Underfunding of the health sector, and structural problems regarding SUS management and professionalization in rural areas pose additional problems. Nevertheless, it is important to consider advancements in empowerment and consolidation of significant collegiate bodies with a regional agenda. Such is the case of Councils of Municipal Health Secretariats (Cosems) and the National Council of Municipal Health Secretariats (Conasems).

As for Amazon particularities, the demand for a structure of its own has had poor repercussion in the Primary Health Care Secretariat (SAPS) of the Ministry of Health. Most health care agents do not know or recognize the region and its specific needs. Countless experts and studies state that it is key to understand health in the Amazon region from various perspectives: the urban Amazon of large centers; the urban Amazon of small towns, some of which experiencing population decline; and the Amazon of riverine communities and indigenous villages. And still the reality of forests - with adjusted views regarding: isolated indigenous groups; legal and illegal miners; and *quilombola* communities living in conservation units (within or out of indigenous lands), with their unique realities, customs, cultures, health practices and survival needs - all that should also be considered (ROCHA *et al*, 2021.)

Economic, political, technical and informational issues contribute to making it difficult to implement health policies and structures customized to the Amazon diversity. Public investment is insufficient and unsuitable in view of the low population density in rural areas and the limited coverage of basic sanitation. Such a situation does not favor treatment and prevention of infectious diseases and makes it harder and more expensive to develop health initiatives.

Most Amazon municipalities have extensive areas and small and sparse populations (89% have fewer than 50,000 inhabitants and 49%, fewer than 30,000.) This directly affects local tax collection, and hence the amount of funds allocated to health at all levels – roughly half when compared to other Brazilian regions. Therefo-

re, one of the main claims of local health managers is that a distinct calculation be applied for fund allocation in the region, adopting the "Amazon factor" when adjusting investments in health.

It is also worth mentioning that health in the Amazon became even more fragile after the adoption of the funding model for primary health care implemented by the Federal Government in 2020. The *"Previne Brasil"* program (Ordinance No. 2.979, dated November 12, 2019) was supposedly conceived to expand access and improve quality, but its results, at least in the Amazon regions, were just the opposite.

Data on health of populations living in rural areas, Conservation Units (UCs) and Indigenous Lands (TIs) are virtually non-existing, and, when available, are highly inconsistent. This makes it difficult to understand these realities and how these populations interact with SUS. The lack of information impairs, for instance, detection of needs, identification of potential endemics and, currently, the monitoring of mercury contamination levels.

Studies conducted by third sector organizations indicate that the creation of specific types of primary health care – the riverine family health care teams and the riverside primary health care units - improve health indicators in the Amazon region, which is clearly evidenced by the increasing attendance by rural communities. These are populations with occasional access to health, and that is why they are virtually excluded from the health care system. Traveling to health care units is slow and takes time – sometimes days – and requires some sort of river transport (Rocha *et al*, 2021; REIS *et al*, 2022;). In addition, there are major communication difficulties among the villages. There is no structured phone or Internet network, and a substantial portion of the information is still exchanged through radio systems.

The main bottlenecks within SUS concern indigenous health. It is hard to settle medical teams in the countryside and there is little availability of pharmaceutical and lab assistance. As a result, few tests are ordered, and medications for adequate treatments aren't always available. Furthermore, interculturality in the treatments and interactions between traditional indigenous medicine and modern medicine must be respected.

The 2023-2026 Federal Government administration appointed the public health physician and scientist Nísia Trindade Lima as Minister of Health, resumed the National Health Conference, proposed adjustments to the *Mais Médicos* program, passed the Federal Telemedicine Law and committed to preparing a Digital Health program. However, the establishment and permanence of physicians in the countryside, particularly in areas of difficult access, is still an issue to be resolved in the Amazon. In 2020, three out of four inhabitants indicated health as the sector most in need of infrastructure and provision of services in the Legal Amazon (ICS E O MUNDO QUE QUEREMOS, 2020).

It is urgent to bring down the current levels of exclusion of Amazon populations, making health care services more accessible in the various locations, and also developing suitable and adapted technologies (floating health care clinics, telemedicine, *Mais Médicos*, etc.). This becomes even more critical considering the importance of the Amazon region both locally and globally. The structuring of health public policies must consider human resources, socio-biodiversity and geography, as well as absorb and value the knowledge accumulated by civil society organizations that operate in these territories.

Panus strigellus

Edible and part of the Yanomami cuisine; studies conducted by the INPA aim to assess the best growth substrate of this species, favoring its production as food; research also ascertains their antimicrobial activity. Found in 1869, the type locality of this species is in Cuba.

06

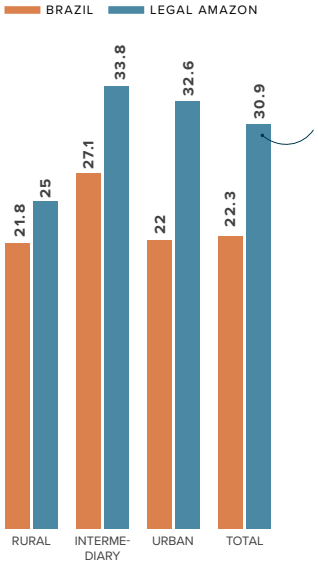
Security

Security in the Amazônias

Security in the Amazon must be understood and treated as a multidimensional issue, comprising different types of connected (in) securities: national, public, human, food, legal and environmental/climate.

RATES OF INTENTIONAL VIOLENT DEATHS

By type of rural-urban municipality



IN 2021, THE AMZL REACHED A RATE OF

30.9%

of intentional violent deaths, above the average rate for Brazil in all types of municipalities (FBSP, 2022)

Between 2018 and 2021, while gun registration by individuals in **BRAZIL WENT UP BY**

130%

the increase in the Legal Amazon was

219%

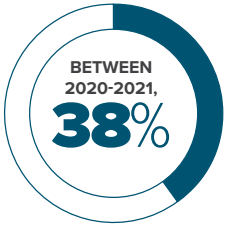
(INSTITUTO IGARAPÉ 2022a);

SOURCE: STATE SECRETARIAT OF PUBLIC SECURITY AND/OR SOCIAL DEFENSE; PC-MG; IBGE AND BRAZILIAN PUBLIC SECURITY FORUM, 2022.

A DECADE OF MURDERS

1,773 territory and environmental defenders were killed between 2012 and 2021, 19% (342) in Brazil. (GLOBAL WITNESS, 2022).

Illegality and impunity



Of the area with logging activities (or 142,000 ha) in the Legal Amazon did not have permission for extraction.

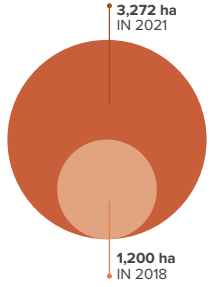
(SOURCE: REDE SIMEX 2022).

OF THESE,

21,000 ha were located in Indigenous Lands

THE AREA DEGRADED BY ILLEGAL MINING of gold in the Yanomami lands jumped from **1,200 hectares in 2018** to **3,272 hectares in 2021**

(SOURCE: HUTUKARA ASSOCIAÇÃO YANOMAMI; ASSOCIAÇÃO WANASSEDUUME YE'KWANA, 2021 AND 2022).

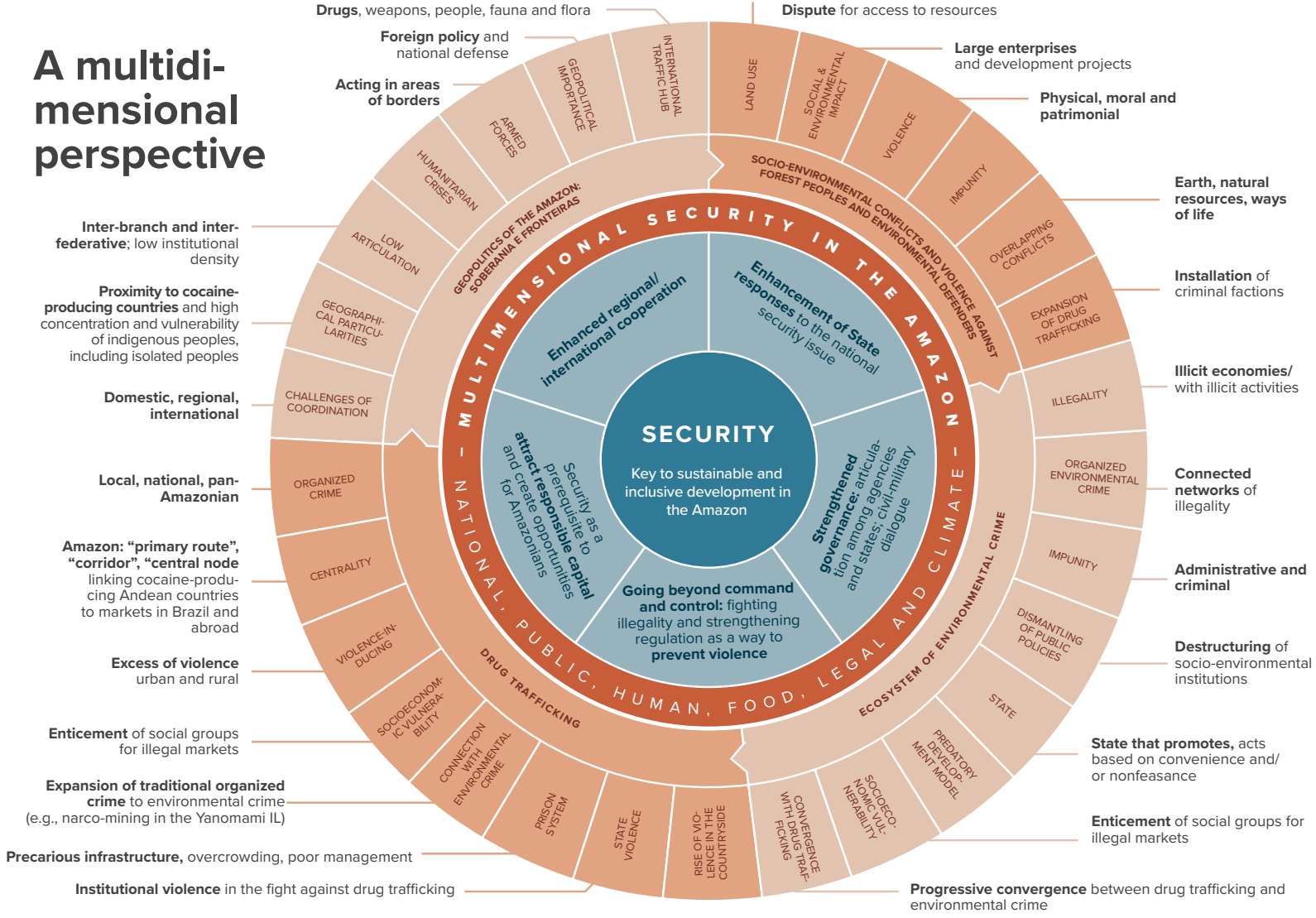


In Brazil, notices of environmental violations carried out by Ibama and ICMBio dropped by **and 54% in 2019 and 2020** (SOURCE: RAJÃO *et al.* 2021).

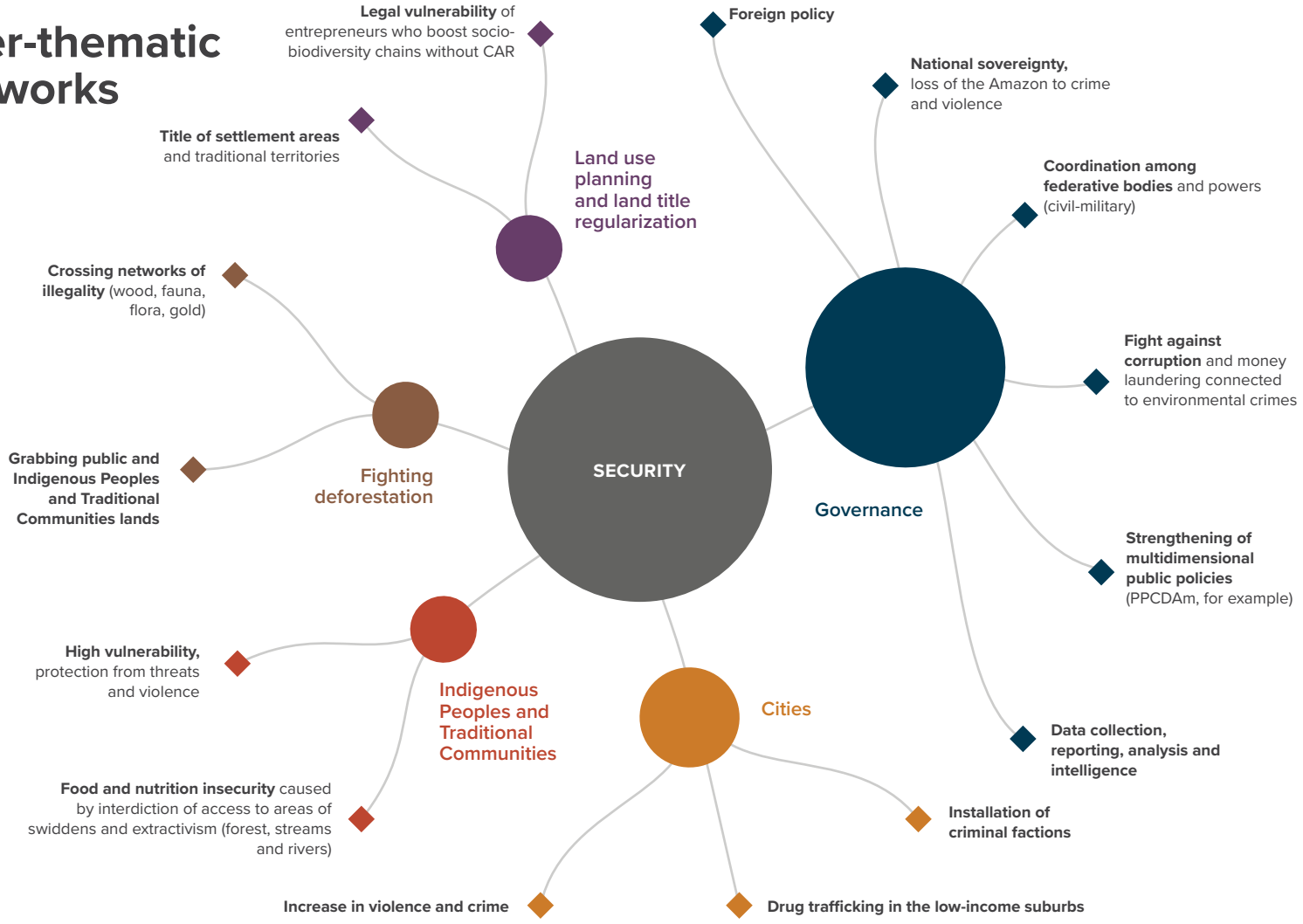
In the same period, the **payment of environmental fines dropped by 74% and 89%** (SOURCE: GATTI *et al.* 2022).

	NOTICE OF ENVIRONMENTAL VIOLATION	PAYMENT OF ENVIRONMENTAL FINES
2019	30% ↓	74% ↓
2020	54% ↓	89% ↓

A multidimensional perspective



Inter-thematic networks



Old and new dynamics of (in)security in the Amazon point to multiple overlapping and intertwined forms of conflict and violence. They are related to land use and access to natural resources, illegal economic exploitation of the forest, and the expansion of drug trafficking networks. Added to these factors are the impacts of large development and infrastructure projects on local populations, especially indigenous peoples and other forest peoples.

Security in the Amazon must be understood and treated as a multidimensional issue. That is, it comprises different types of connected (in)securities: national, public, human, food, legal and environmental/climate. A mapping of collected data, information and knowledge about security in the Amazon reveals a growing effort by different types of organizations, including universities, to understand the phenomenon. Of the 75 key studies on security in the Amazon identified between 2005 and 2023, 45% were conducted by civil society organizations (INSTITUTO IGARAPÉ, 2023).

Together, these publications ratify not only the diversity of topics related to security in the Amazon, but also a recurring look from the opposite side – the insecurities –, discussing causes, manifestations and consequences. Although strongly focused on "the problem" and not on the web of relationships that originate it, many of the publications contain critical analyses on State responses to the different manifestations of insecurity in the Amazon. And they offer practical recommendations for improving State action, with suggestions for reforms and propositions of alternative approaches. Examples include civil-military dialogue, articulation among agencies and among cities and states, and the strengthening of regional/international cooperation.

Traditionally, issues of (in)security and violence in the Amazon have been studied and addressed by public policies from three points of view: a) violence linked to rural conflicts and environmental crime; b) urban violence; and c) violence resulting from the actions of drug trafficking factions. Together, these manifestations are responsible for the "excess of violence" observed in the region, when compared to the rest of the country.

It is clear in the literature that, although the separation between "urban and rural" or "city and forest" is pertinent and relevant for the formulation of public policies addressing different contexts in the many Amazônias, this division has limitations. This is because security in this region is a shifting phenomenon, given the ever-increasing interconnection of players and dynamics of conflict and violence between urban and rural/forest spaces. This occurs both because of the ramifications of organized environmental crime in cities, and because of the new forms of public insecurity arising from the expansion of factions and drug trafficking in the Amazon.

Since the 1980s, the issue of drug trafficking in the Amazon has been related to discussions on geopolitics, national security and borders. However, from the 2000s onwards, the theme began to be brought up in debates on public security and violence in the region. At the same time, the theme of environmental and climate security has also grown in importance. The latter has first appeared connected to Brazilian geopolitics and international relations (and its implications for foreign policy and national defense) and, more recently, in its interface with public security (Becker, 2005; Martins e Moreira 2008; Franchi *et al* 2011; dos Santos 2013; Macedo 2021; Brazilian Public Security Forum 2022; Instituto Igarapé 2022).

Cantharellus amazonenses

Ectomycorrhizas, they form mutualistic relationships, absorbing nutrients for plant growth; they have bioactive properties, such as the production of protease and lipase enzymes. Discovered in 2012, the type locality of the species is in Florida.

Especially between 2019 and 2023, the growth and transformation of illegal deforestationand forest degradation in the Amazon becomes evidently based on the modus operandi of organized environmental crime (a set of economic activities carried out outside the law). The so-called ecosystem of environmental crime in contemporary Amazon involves an increasingly diverse group of players and makes use of increasingly complex methods of fraud and corruption. Consequently, it leads to increasing manifestations of violence, especially against forest peoples, but also against environmental conservation servants and security forces. (GREENPEACE, 2017; HUMAN RIGHTS WATCH 2019; STASSART *et al*, 2021; GLOBAL WITNESS 2022; VIEIRA E FALCÃO, 2022; WAISBICH *et al*. 2022).

Much of the insecurity and violence observed in contemporary Amazon (2023) is explained by two independent forms of organized crime, although increasingly converging: organized crime linked to the activities of prison gangs and drug trafficking factions, and organized environmental crime. Organized environmental crime is what enables the operation of the illegal trade, extraction and exploitation of resources in forest areas in the Amazon. In addition to environmental violations related to the fauna and flora per se, organized environmental crime also encompasses non-environmental offenses, such as fraud, corruption, money laundering, land grabbing, as well as violent crimes (STASSART *et al*, 2021; VIEIRA E FALCÃO, 2022; WAISBICH *et al*, 2022).

Even though not all environmental crimes are violent, in the Amazon, organized environmental crime has become increasingly violent. This violence has many manifestations, some more visible than others. It can be seen, for example, in the competition among land grabbers, loggers and illegal miners for resources. Or in the various attacks of these players on forest peoples and environmental defenders, in the form of murders, intimidation, threats, assassination attempts, sexual violence, invasion, destruction of property, as well as other less visible forms of violence, either moral or cultural.

Since the 2000s, illegal logging has been the setting of great violence in the Amazon, especially against native peoples. In recent years, there has been a significant increase in violence associated with illegal gold mining (GREENPEACE 2017; HUMAN RIGHTS WATCH 2019; SOARES *et al*. 2021; INSTITUTO IGARAPÉ 2021; MOLINA E WANDERLEY, 2021).

Much has been said about the Amazon as a laboratory for the emergence of inclusive sustainable development paradigms. And there are promising initiatives under way in that direction, both led by the State and by civil society. In the wake of these debates, it takes courage and assertiveness to view the issue of security and its relationships with other themes as the key to a social transformation committed to environmental conservation. And thus ensure the transition to fair economies compatible with standing forests.

Paths to cooperation

Over the past three years, with a driving ambition of helping improve the quality of life in the Amazon region, the Amazon Concertation has identified key themes for this agenda. Such content was featured in the network's first publication in 2021, 'An agenda for the development of the Amazon'. Since then, we have developed new ways of understanding and taking action in the territories so that advances in the (re)cognition of regional diversities materialize in the form of local opportunities.

In a challenging context of setbacks in the Brazilian socio-environmental agenda in recent years, we realized that it was essential to indicate initiatives that strengthen institutional capacities of sectors that are important for environmental conservation, for the well-being of local communities and for economic development. For this reason, in 2022 we published the second document prepared by the Concertation, 'The first 100 days of government: proposals for an integrated agenda for the Amazônias', in which we structured normative acts that could support the administration of governments elected for the 2023-2026 term.

In this third document, the discussion about key themes of the Amazon development agenda has expanded and matured. And now we focus our attention on identifying connections and qualifying the relationships among six themes – of many others – that we deem structuring for this agenda. But why is it important to analyze the relationships among the themes of the Amazon development agenda?

First, because many of the themes on that agenda are interdependent. Advances and actions in one of them can provoke responses that are not always positive, such as overlaps and trade-offs, from the other themes. Secondly, because identifying and qualifying connections and relationships may open up opportunities for synergistic actions among interdependent sectors, and thus, boost the positive impact of initiatives and strategies. And, finally, because behind connections and relationships are players and sectors with a chance to cooperate in different ways and varying intensities so that trade-offs are avoided, and synergies reinforced.

We understand that looking at the Amazon development agenda as an interconnected system can indeed be a feasible means to cross-sectionally put into practice interdisciplinary agendas and materialize intersectoral projects and projects among players (governments-civil society) with socio-environmental impacts.

Acknowledgments

The Amazon Concertation greatly appreciates the valuable contributions of all members of the network, who directly or indirectly put their effort into this project. We reaffirm our role as a democratic space for dialogue and knowledge sharing. The proposals presented here do not necessarily reflect a consensus among participants and should not be attributed to any person individually or to their respective institutional agendas.

Favolus brasiliensis

Edible and part of Yanomami cuisine; in the indigenous agricultural system, termed “slash and burn agriculture”, this fungus is collected from decomposing trunks, remnants of the scorching wood. Discovered in 1821, the type locality of this species is in the state of Pará.

Footnotes

ASSUMPTIONS AND ELEMENTS OF THE INTEGRATED APPROACH

1. Water, Energy, Food Nexus (Hoff, 2011), Nature Based Solutions to address global societal challenges (IUCN, 2016) and Agroecologia [Agroecology] (Fornazier, A. *et al*, 2022), for example.
2. Extracted from Lotta, G. & Favareto, A. Desafios da integração nos novos arranjos institucionais de políticas públicas no Brasil [Integration challenges in the new institutional arrangements of public policies in Brazil]. Revista de Sociologia e Política. 24(57). 2016.

AN INTEGRATED AGENDA: THEMES AND INITIATIVES

1. This section is partially based on work done by the Science Panel for the Amazon (SPA) - WG 12: Power of Amazon Peoples
2. Part of this section was developed based on a text by Francisco Gaetani, Extraordinary Secretary for the Transformation of the State, and Izabella Teixeira, former Minister of the Environment and senior fellow at the Arapyaú Institute, in 'The first 100 days of government: proposals for an integrated agenda for the Amazônias'.

AN AGENDA FOR THE AMAZON: CONNECTIONS AMONG THEMES AND CONTEXTS

1. The Amazon Concertation intends, in the short- and medium-term, to keep on applying the integrated approach adding more themes to the analysis, such as land use planning and land title regularization, infrastructure, and connectivity.
2. Instituto Nacional de Pesquisas Espaciais (National Institute for Space Research), a Federal Government research agency responsible for monitoring land use in Brazilian biomes.
3. Data from IBGE, 2010 Census and population estimates (2021). The most recent data from the 2022 Census is not yet available.
4. Data from the Palmares Cultural Foundation – FCP (2023).

Acronyms

AMZ 2030: Amazônia 2030 project
AMZL: Brazilian Legal Amazon
APIB: Articulation of Indigenous Peoples of Brazil
ATeG: Technical and Managerial Assistance
ATER: Technical Assistance and Rural Extension
IDB: Inter-American Development Bank
BNCC: Common National Curricular Base
BNDES: National Bank for Economic and Social Development
CAPES: Coordination for the Improvement of Higher Education Personnel
CAR: Rural Environmental Registry ECLAC/
CEPAL: Economic Commission for Latin America and the Caribbean
CGEE: Center for Management and Strategic Studies
CNE: National Council of Education
CNPq: National Council for Scientific and Technological Development
CNS: National Council of Extractivist Populations
LEAF Coalition: Coalition of countries for Lowering Emissions by Accelerating Forest finance
COIAB: Coordination of the Indigenous Organizations of the Brazilian Amazon
CONAQ: National Coordination of Articulation of Black Rural Quilombola Communities
CONASEMS: National Council of Municipal Health Secretariats
CONEXSUS: Sustainable Connections Institute
CONSEA: National Council for Food and Nutrition Security
COSEMS: State Council of Municipal Health Secretariats
COP26: 26th UN Climate Change Conference of the Parties
CTD: Technical Chamber of Destination
STI: Science, Technology and Innovation.
CT-PIM: Science, Technology, and Innovation Center for the Manaus Industrial Park
EaD/DL: Distance Learning
Embrapa: Brazilian Agricultural Research Corporation
EMBRAPII: Brazilian Company of Research and Industrial Innovation
EPT: Professional and Technological Education
FAPAC: Acre State Research Support Foundation
FAPEAM: Amazonas State Research Support Foundation
FAPEAP: Amapá State Research Support Foundation
FAPEMA: Foundation for the Support of Research and Scientific and Technological Development of Maranhão state
FAPEMAT: Mato Grosso State Research Support Foundation
FAPERO: Foundation for the Development of Scientific and Technological Actions and Research of Rondônia state
FAPERR: Roraima State Research Support Foundation
FAPESPA: Amazon Foundation for the Support of Studies and Research (in the State of Pará)
FAPT: Tocantins State Research Support Foundation
FAS: Foundation for Amazon Sustainability
FGV: Getúlio Vargas Foundation
Finep: Financier of Studies and Projects
FNDCT: National Fund for Scientific and Technological Development
FNE: National Education Forum
FPE: State Participation Fund
FPM: Municipal Participation Fund
Funai: National Foundation of Indigenous Peoples
FUNTEC: Fund for Scientific and Technical Development
FUST: Fund for Universalization of Telecommunications Services
FVA: Vitória Amazônica Foundation
GCF Task Force: Governors' Climate and Forests Task Force
GHG: Greenhouse Gas
GT/WG: Work Group
IBAMA: Brazilian Institute for the Environment and Renewable Natural Resources
IBGE: Brazilian Institute of Geography and Statistics
ICMBio: Chico Mendes Institute for Biodiversity Conservation
Idesam: Institute for Conservation and Sustainable Development of the Amazon
IDSM: Mamirauá Sustainable Development Institute
IEMA: Institute of Environmental Management and Assessment
IEPA: Institute of Scientific and Technological Research of Amapá state
IFAC: Acre Federal Institute
Imazon: Amazon Institute of People and the Environment
INCRA: National Institute for Colonization and Agrarian Reform

INEP: National Institute of Educational Studies and Research Anísio Teixeira
INPA: National Institute for Amazonian Research
INPE: National Institute for Space Research
IPAM: Amazon Environmental Research Institute
ISA: Instituto Socioambiental or Socio-environmental Institute
ITR: Rural Real Estate Tax
LDB: Brazilian National Education Guidelines and Framework Law
LGBTQIA+: Acronym used to signify Gay, Lesbian, Bisexual, Transgender, Queer, Intersex, Asexual, and other terms (such as non-binary and pansexual) people collectively
MCTI: Ministry of Science, Technology and Innovation
MCTI/CGEE: Center for Management and Strategic Studies of the Ministry of Science, Technology and Innovation
MDA: Ministry of Agrarian Development and Family Agriculture
MDIC: Ministry of Development, Industry, Commerce and Services
MMA: Ministry of the Environment and Climate Change
MNU: Unified Black Movement
MPI: Ministry of Indigenous Peoples
ODS/SDG: Sustainable Development Goals
OMS/WHO: World Health Organization
ORMM: Observatory of the Metropolitan Region of Manaus
OT: Territorial Planning or Land Use Planning
OTCA/ACTO: Amazon Cooperation Treaty Organization
OTRF: Land Tenure Regularization and Land Use Planning
PAA: Food Acquisition Program
PAE: Agro-Extractivist Settlement Project
PDS: Sustainable Development Project
PENSANN: Brazilian Research Network on Food and Nutritional Sovereignty and Security
PIB/GDP: Gross Domestic Product
PNAD: National Household Sample Survey
PNAE: National School Feeding Program
PNE: National Education Plan
PNL 2035: 2035 National Logistics Plan
PPA: Partnership Platform for the Amazon
PPB: Basic Production Process
PPBio: Bioeconomy Priority Program
PPCDAm: Action Plan for Prevention and Control of Deforestation in the Amazon
PRONAF: National Program for Strengthening Family Farming
PSA/PES: Payments for Environmental Services
ReCS: Shared Sectoral Resources
REDD+: Reducing Emissions from Deforestation and Forest Degradation
RDS: Sustainable Development Reserve
RESEX: Extractive Reserve
SAFs: Agroforestry Systems
SAPS: Primary Health Care Secretariat of the Ministry of Health
SEBRAE: Brazilian Micro and Small Business Support Service
SENAI: National Service for Industrial Training
SFB: Brazilian Forest Service.
SICAR: National Rural Environmental Registry System
SISNAMA: National Environmental System
SNCTI: National System of Science, Technology and Innovation
SNUC: National System of Conservation Units
SUDAM: Superintendence for the Development of the Amazon
SUS: Unified Healthcare System
SUSP: Unified Public Security System
TIs: Indigenous Lands
UC: Conservation unit
UEPA: Pará State University
UFAM: Federal University of Amazonas
UFMA: Federal University of Maranhão
UFMT: Federal University of Mato Grosso
UFOPA: Federal University of Western Pará
UFPA: Federal University of Pará UFRA: Federal Rural University of the Amazon
UNAMA: University of the Amazon
UNEMAT: Mato Grosso State University
UNIFAP: Federal University of Amapá
USAID: United States Agency for International Development
USP: University of São Paulo
WRI: World Resources Institute.
WTT: World-Transforming Technologies.
WWF: World Wildlife Fund.
ZFM: Manaus Free Trade Zone

References

ALMEIDA, Alfredo W. B de. **Terras tradicionalmente ocupadas: processos de territorialização e movimentos sociais.** [Traditionally occupied lands: territorialization processes and social movements] Revista Brasileira de Estudos Urbanos e Regionais (RBEUR), v.6, n.1, 2004. Available at https://rbeur.anpur.org.br/rbeur/article/view/102/86. Accessed on: Jul 25, 2023.

ALMEIDA, Alfredo W. B. de. **Quebradeiras de coco babaçu: um século de mobilizações e lutas** [Babaçu coconut female crackers - a century of mobilization and struggles] Repertoire of documentary and archival sources, legal provisions and collective actions (1915-2018). Manaus: UEA Edições/PNCSA, 2019.

AMAZÔNIA LEGAL EM DADOS. [LEGAL AMAZON IN DATA] **Taxa de Mestres e Doutores**. [Percentage of people with Master's or Doctoral Degrees] The Amazon Concertation, 2022a. Available at: https://amazonialegalemdados.info/dashboard/perfil.php?regiao=Amaz%C3%B4nia%20Legal&area=Ci%C3%AAncia%20e%20Tecnologia__56&indicador=TX_CAPES_TITULADOS_UF__56&primeiro. Accessed on Jul 26, 2023.

AMAZÔNIA LEGAL EM DADOS. [LEGAL AMAZON IN DATA] **Número de Patentes Concedidas**. [Number of Patents Granted] The Amazon Concertation, 2022b. Available at: https://amazonialegalemdados.info/dashboard/perfil.php?regiao=Amaz%C3%B4nia%20Legal&area=Ci%C3%AAncia%20e%20Tecnologia__56&indicador=TX_INPI_PATENTES_CONCEDIDAS_UF__56. Accessed on Jul 26, 2023.

AMAZÔNIA LEGAL EM DADOS. [LEGAL AMAZON IN DATA] **Percentual dos Dispêndios Totais em C&T**. [Percentage of Total Expenditure on S&T] The Amazon Concertation, 2022c. Available at: https://amazonialegalemdados.info/dashboard/perfil.php?regiao=Amaz%C3%B4nia%20Legal&area=Ci%C3%AAncia%20e%20Tecnologia__56&indicador=TX_MCTIC_DISPENDIOS_UF__56. Accessed on Jul 26, 2023.

BANCO NACIONAL DE DESENVOLVIMENTO ECONÔMICO E SOCIAL (BNDES) [National Bank for Economic and Social Development]. BNDES Open Data Portal, 2021. Available at: https://dadosabertos.bndes.gov.br/. Accessed on: Jul 25, 2023.

BARABÁSI, Albert-László. **Taming complexity.** Nature Physics, 1(2), Nov 2005, p. 68–70. Available at: https://doi.org/10.1038/nphys162. Accessed on Jul 27, 2023.

BECKER, Bertha K. **Geopolítica da Amazônia.** [Amazon Region Geopolitics] Estudos Avançados 19, n. 53, Apr. 2005, p. 71–86.

BERGAMO, D.; ZERBINI, O.; PINHO, P.; MOUTINHO, P. ***The Amazon bioeconomy: Beyond the use of forest products.*** **Ecological Economics**, v. 199, Set 2022. Available at: http://dx.doi.org/10.1016/j.ecolecon.2022.107448. Accessed on: Jul 25, 2023.

BIRNER, R. Bioeconomy Concepts. In LEWANDOWSKI, I (ed.). **Bioeconomy: shaping the transition to a sustainable, biobased economy**. Springer, Cham, 2018. Available at: https://link.springer.com/chapter/10.1007/978-3-319-68152-8_3

BORGATTI, S.; EVERETT, M.; JOHNSON, J. **Analyzing Social Networks**. Los Angeles/EUA: Sage Publications, 2013.

BRAZIL. MINISTÉRIO DA AGRICULTURA E PECUÁRIA (MAPA). [Ministry of Agriculture, Livestock, and Food Supply] **Ordinance nº 575 of April 05, 2023**. Established the Amazon Agricultural Development Plan - Sustainable Amazon Plan. Brasília, DF: MAPA, 2023. Available at: https://www.in.gov.br/en/web/dou/-/portaria-mapa-n-575-de-5-de-abril-de-2023-475758806. Accessed on: Jun 29, 2023

BRAZIL. MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E INOVAÇÃO (MCTI). [Ministry of Science, Technology and Innovation] **Plano de Ação em Ciência, Tecnologia e Inovação em Bioeconomia**. [Science, Technology and Innovation in Bioeconomy Action Plan] Brasília: MCTI, 2018. Available at: <https://repositorio.mctic.gov.br/bitstream/mctic/4355/1/2018_plano_acao_ciencia_tecnologia_inovacao_bioeconomia.pdf. Accessed on: Jul 25, 2023.

BRAZIL. MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E INOVAÇÃO (MCTI). [Ministry of Science, Technology and Innovation] **Patents – INPI – Brazil Branch**. updated Mar 09, 2021. Brasília, 2021. Available at: https://antigo.mctic.gov.br/mctic/opencms/indicadores/detalhe/Patentes/INPI/6.1.1.html. Accessed on Jul 26, 2023.

BRAZIL. MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E INOVAÇÃO (MCTI). [Ministry of Science, Technology and Innovation] **Recursos Aplicados – Governo Federal**. [Applied Resources – Federal Government] May 30, 2022. Brasília, 2022a. Available at: https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/indicadores/paginas/recursos-aplicados/governo-federal. Accessed on Jul 26, 2023.

BRAZIL. MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E INOVAÇÃO (MCTI). [Ministry of Science,

Technology and Innovation] **Recursos Aplicados – Governos Estaduais**. [Applied Resources – State Governments] May 30, 2022. Brasília, 2022b. Available at: https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/indicadores/paginas/recursos-aplicados/governos-estaduais. Accessed on Jul 26, 2023.

BRAZIL, MINISTÉRIO DA EDUCAÇÃO (MEC). [Ministry of Education] **Plano Nacional de Educação** [National Education Plan] **– Law N. 13.005/2014**. Brasília, 2014. Available at: https://pne.mec.gov.br/18-planos-subnacionais-de-educacao/543-plano-nacional-de-educacao-lei-n-13-005-2014. Accessed on Jul 27, 2014.

BRAZIL. MINISTÉRIO DA EDUCAÇÃO. [Ministry of Education] INEP. **Censo escolar da Educação básica 2022: Resumo Técnico.** [Basic Education Census 2022: Technical Summary] Brasília, DF: Inep, 2023a.

BRAZIL. MINISTÉRIO DA EDUCAÇÃO. [Ministry of Education] INEP. **Relatório do 4º Ciclo de Monitoramento das Metas do Plano Nacional de Educação**. [Report on the 4th Assessment Cycle of the National Education Plan Goals] Report. Brasília, DF: Inep, 2023b. Available at: https://download.inep.gov.br/publicacoes/institucionais/plano_nacional_de_educacao/relatorio_do_quarto_ciclo_de_monitoramento_das_metas_do_plano_nacional_de_educacao.pdf . Accessed on: Jul 06, 2023.

BRAZIL. MINISTÉRIO DO MEIO AMBIENTE E MUDANÇA DO CLIMA (MMA). [Ministry of the Environment and Climate Change] **Categorias**. [Categories] 2020. Available at: https://www.mma.gov.br/areas-protegidas/unidades-de-conservacao/categorias.htm. Accessed on Jul 26, 2023.

BRAZIL. MINISTÉRIO DA SAÚDE (MS). **Sistema Único de Saúde**. [Unified Healthcare System] Brasília, 2023. Available at: https://www.gov.br/saude/pt-br/assuntos/saude-de-a-a-z/s/sus. Accessed on Jul 26, 2023.

BRITO, Brenda; GOMES, Pedro. **Propostas para um Ordenamento Territorial na Amazônia que Reduza o Desmatamento**. [Proposals for Land Use Planning in the Amazon to Reduce Deforestation] Amazônia 2030 Project, n. 46, Jun 2022. Available at: https://amazonia2030.org.br/wp-content/uploads/2022/06/AMZ-2030-46-1.pdf. Accessed on: Oct 03, 2022.

BUGGE, Markus M.; HANSEN, Teis; KLITKOU, Antje. **What Is the Bioeconomy? A Review of the Literature.** Sustainability, v. 8, ed. 7, Jul 2016. Available at: https://doi.org/10.3390/su8070691. Accessed on Jul 24, 2023.

CAMPANHA NACIONAL PELO DIREITO À EDUCAÇÃO. [National Campaign for the Right to Education] **Balanço do Plano Nacional de Educação** [Assessment of the National Education Plan], 2023. Available at https://campanha.org.br/acervo/balanco-do-pne-plano-nacional-de-educacao-2023/. Accessed on: Jun 28,2023.

CECHIN, Andrei D. e VEIGA, José Eli da. **A economia ecológica e evolucionária de Georgescu-Roegen**. [Georgescu-Roegen's environmental and evolutionary economics] Revista de Economia Política [Journal of Political Economics], v. 30, n. 3, p. 438-454, 2010. Available at: http://www.zeeli.pro.br/Textos/ArtigosCientificos/2010/Cechin&Veiga%20-%20REP%2030(3)119%20jul-set2010%20(438-454).pdf. Accessed on: Jul 24, 2023.

CENTRO DE GESTÃO E ESTUDOS ESTRATÉGICOS (CGEE) [Center for Management and Strategic Studies]. **Oportunidades e desafios da bioeconomia: proposta de observatório em bioeconomia**. [Opportunities and challenges of the bioeconomy: proposal for an observatory in bioeconomy] Brasília, DF: CGEE, 2020.

COHEN-SHACHAM, E.; WALTERS, G.; JANZEN, C; MAGINNIS, S. (orgs.). **Nature-based Solutions to address global societal challenges**. Switzerland: IUCN, 2016.

COIAB. **Carta da Amazônia 2021**: **aos participantes da 26ª Conferência das Nações Unidas sobre Mudanças Climáticas (COP26).** [Amazon Letter 2021: to the participants of the 26th United Nations Conference on Climate Change] Encontro Amazônico da Sociobiodiversidade. [Amazon Conference on Socio-biodiversity] Belém, PA, 2021. Disponível em: https://coiab. org.br/documentos. Accessed on: Jul 25, 2023.

CONSELHO FEDERAL DE MEDICINA (CFM). [Federal Council of Medicine] **Demografia Médica** [Medical Demographics], updated. Feb 10, 2023. Available at: https://demografia.cfm.org.br/dashboard/. Accessed on: Jul 26, 2023.

COSTA, Francisco de A. *et al*. **Uma Bioeconomia Inovadora para a Amazônia**: conceitos, limites e tendências para uma definição apropriada ao bioma floresta tropical. [An Innovative Bioeconomy for the Amazon: Concepts, Limits and Trends for a Definition Adjusted to the Tropical Forest Biome] Text for discussion. São Paulo: WRI Brasil, 2022. Available at: https://doi.org/10.46830/wriwp.21.00168pt. Accessed on: Jul 24, 2023.

COSLOVSKY, Salo. **Oportunidades para Exportação de Produtos Compatíveis com a Floresta na Amazônia Brasileira**. [Opportunities for Exporting Products Compatible with the Forest in the Brazilian Amazon] Amazônia 2030 Project, n. 02, Apr. 2021a. Available at: https://amazonia2030.org.br/wp-content/uploads/2021/04/AMZ2030-Oportunidades-para-Exportacao-de-Produtos-Compativeis-com-a-Floresta-na-Amazonia-Brasileira-1-2.pdf. Accessed on: Jul 24, 2023.

CRUZ, Tássia; PORTELLA, Juliana. **A Educação na Amazônia legal: diagnósticos e pontos críticos**. [Education in the legal Amazon: diagnoses and critical issues] Amazônia 2030 Project, n. 24, Dec 2021. Available at https://amazonia2030.org.br/wp-content/uploads/2021/12/AMZ2030-A-Educacao-na-Amazonia-Legal.pdf. Accessed on Jul 26, 2023.

CRUZ, Tássia; PORTELLA, Juliana. **A Educação na Amazônia Legal: Políticas de Educação Profissional**. [Education in the legal Amazon: Vocational Education Policies] Amazônia 2030 Project, n. 48, Jul 2022. Available at: https://amazonia2030.org.br/a-educacao-na-amazonia-legal-politicas-de-educacao-profissional/. Accessed on: Oct 04, 2022.

DERRUBANDO MUROS. [Knlcking Down Walls] **Uma agenda inadiável - Propostas da Sociedade Civil:** políticas públicas para

um Brasil democrático com justiça, prosperidade e esperança, [An urgent agenda - Civil Society Proposals: public policies for a democratic Brazil with justice, prosperity and hope], 2022. Available at: http://derrubandomuros.rds.land/umaagendainadiavel. Accessed on: Oct 03, 2022.

EUROPEAN UNION (EU). **En route to the knowledge-based bioeconomy**. ("Cologne Paper") German Presidency of the Council of the European Union (EU), Cologne, 2007. Available at: https://dechema.de/dechema_media/Downloads/Positionspapiere/Cologne_Paper.pdf. Accessed on: Jul 25, 2023.

FEDERAÇÃO BRASILEIRA DE GEÓLOGOS (FEBRAGEO). [Brazilian Federation of Geologists] **Mineração em Terras Indígenas**: um posicionamento necessário. [Mining in Indigenous Lands: an indispensable positioning] Report. Brasília: Federação Brasileira de Geólogos, 2020. Available at: https://www.febrageo.org.br/downloads/Mineração-em-Terras-Indígenas.pdf. Accessed on: Oct 10, 2022.

FEDERAÇÃO BRASILEIRA DE GEÓLOGOS (FEBRAGEO). [Brazilian Federation of Geologists] **Potássio, mineração em Terras Indígenas e os conflitos acirrados pela guerra no leste europeu**. [Potassium, mining in Indigenous Lands and conflicts worsened by the war in Eastern Europe] Letter from the Board. Federação Brasileira de Geólogos, 2022b. Available at: https://www.febrageo.org.br/nota-febrageo-potassio-mineracao-em-terras-indigenas-e-guerra-leste-europeu. Accessed on: Oct 10, 2022.

FORNAZIER, A.; BARRETO, C.; JORDÃO, G.; DARNET, L. **O nexus água, alimento e energia e a agroecologia:** perspectivas e desafios para uma oportuna convergência. [The water-energy-food nexus and agroecology: perspectives and challenges for a timely convergence] In FORNAZIER, A. et al. **Nexo água-energia-alimento e a Agroecologia**: reflexões, experiências e resultados de pesquisa. [Water-energy-food nexus and agroecology: reflections, experiences and research findings] Curitiba: Editora Appris, 2022.

FÓRUM BRASILEIRO DE SEGURANÇA PÚBLICA (FBSP) [Brazilian Public Security Forum] (org.). **Governança e capacidades institucionais da segurança pública na Amazônia.** [Governance and public security institutional capacities in the Amazon] São Paulo: 2022. Available at https://forumseguranca.org.br/publicacoes_posts/governancas-e-capacidades-institucionais-da-seguranca-publica-na-amazonia/. Accessed on Jul 25, 2023.

FRANCHI, Tássio; BURSZTYN, Marcel; DRUMMOND, Augusto Leão. **A Questão Ambiental e o Adensamento da Presença do Exército Brasileiro na Amazônia Legal no Final do século XX.** [Environmental Issues and the Increasing Presence of the Brazilian Army in the Legal Amazon at the Closing of the 20th Century] Novos Cadernos NAEA, 14, n. 1, Oct 2011.

FUNDAÇÃO AMAZÔNIA SUSTENTÁVEL (FAS); [Foundation for Amazon Sustainability] INSTITUTO UNIBANCO (IU). **Radar educacional amazônico**: **iniciativas promissoras para a educação de populações.** [Amazon education radar: promising initiatives for the education of local populations] Manaus, AM: Fundação Amazônia Sustentável [Foundation for Amazon Sustainability], 2022. Available at: https://fas-amazonia.org/novosite/wp-content/uploads/2022/03/radar-educacional-amazonico.pdf. Accessed on: Jul 10, 2023.

FUNDAÇÃO CULTURAL PALMARES (FCP). [Palmares Cultural Foundation] **Certidão Quilombola** - **Comunidades certificadas**: Certidões expedidas às comunidades remanescentes de quilombos (CRQs). [Quilombola Certificate - Certified Communities: Certificates issued to remaining Quilombola communities (CRQs)] 2023. Available at: https://www.gov.br/palmares/pt-br/departamentos/protecao-preservacao-e-articulacao/certificacao-quilombola. Accessed on Jul 26, 2023.

GATTI, Luciana et al. **Amazon Carbon Emissions Double Mainly by Dismantled in Law Enforcement**. Research Square, Set, 2022 (pré-publicação). Available at: https://www.researchsquare.com/article/rs-2023624/v1. Accessed on Jul 26, 2023.

GEORGESCU-ROEGEN, Nicholas. **The Entropy Law and the Economic Process**. Cambridge, MA: Harvard University Press, 1971.

GIAMPIETRO, Mario. **On the Circular Bioeconomy and Decoupling: implications for sustainable growth.** Ecological Economics, v. 162, p. 143-156, 2019.

GLOBAL WITNESS. **Decade of Defiance**: **Ten years of reporting land and environmental activism worldwide**. Relatório. Londres, 2022. Available at: https://www.globalwitness.org/en/campaigns/environmental-activists/decade-defiance/. Accessed on: Jul 25, 2023.

GREENPEACE. **Madeira manchada de sangue**. [Blood-stained wood] São Paulo: Greenpeace, 2017. Available at: https://www.greenpeace.org/brasil/publicacoes/madeira-manchada-de-sangue/. Accessed on: Jul 25, 2023.

HAGE, Salomão A. M. **Transgressão do Paradigma da (multi) seriação como referência para a construção da Escola Pública do Campo**. [Transgression of the (multi)Grade Paradigm as a reference for the creation of the Rural Public School] Revista Educação e Sociedade, v. 35, n. 129, Oct 2014, p. 1165-1182. Campinas: Sedes, 2014. Available at: https://www.scielo.br/j/es/a/wRdr8Zb3jCBdnLYD3sFrWCn/abstract/?lang=pt. Accessed on: Jun 21, 2023.

HOFF, H. **Understanding the Nexus.** Background Paper for the Bonn2011 Conference: The Water, Energy and Food Security Nexus. Stockholm Environment Institute, Stockholm. 2011.

HUMAN RIGHTS WATCH. **Máfias do Ipê: como a violência e a impunidade impulsionam o desmatamento na Amazônia brasileira.** [Ipê tree mafias: how violence and impunity drive deforestation in the Brazilian Amazon] São Paulo: 2019. Available at: https://www.hrw.org/pt/report/2019/09/17/333519. Accessed on: Jul 25, 2023.

HUTURAKA ASSOCIAÇÃO YANOMAMI; ASSOCIAÇÃO WANASSEDUUNE YE'KWANA. **Cicatrizes na Floresta: evolução do garimpo ilegal na TI Yanomami em 2020.** [Scars in the Forest: evolution of illegal mining in

the Yanomami Indigenous Lands in 2020] Instituto Socioambiental (ISA) [Socio-environmental Institute], Mar. 2021. Available at: https://acervo.socioambiental.org/acervo/documentos/cicatrizes-na-floresta-evolucao-do-garimpo-ilegal-na-ti-yanomami-em-2020. Accessed on: Jul 26, 2023.

HUTURAKA ASSOCIAÇÃO YANOMAMI; ASSOCIAÇÃO WANASSEDUUNE YE'KWANA. **Yanomami sob ataque: garimpo ilegal na Terra Indígena Yanomami e propostas para combatê-lo.** [Yanomami people under attack: illegal mining in the Yanomami Indigenous Land and proposals for combating it] Instituto Socioambiental (ISA) [Socio-environmental Institute], Apr. 2022. Available at: https://acervo.socioambiental.org/acervo/documentos/yanomami-sob-ataque-garimpo-ilegal-na-terra-indigena-yanomami-e-propostas-para. Accessed on: Jul 26, 2023.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA (IBGE). [Brazilian Institute of Geography and Statistics] **Censos Nacionais de 1872, 1991, 2000 e 2010.** SIDRA – Banco de tabelas estatísticas. Available at: https://sidra.ibge.gov.br/. Accessed on: Jul 25, 2023.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA (IBGE). [Brazilian Institute of Geography and Statistics] Tables 289, 3.585, 3.586 and 5.938. 2010 National Census. Available at: https://sidra.ibge.gov.br/.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA (IBGE). [Brazilian Institute of Geography and Statistics] Tables 6.949, 6.950 and 6.778 – 2017 Agricultural Census. Available at: https://sidra.ibge.gov.br/.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA (IBGE). [Brazilian Institute of Geography and Statistics] **Base de Informações Geográficas e Estatísticas sobre os indígenas e quilombolas para enfrentamento à Covid-19** [Geography and Statistics Information Base on Indigenous Peoples and Quilombolas for tackling Covid-19] – Technical Notes. Special Volume. Rio de January, 2020. Available at: https://www.ibge.gov.br/geociencias/organizacao-do-territorio/tipologias-do-territorio/27480-base-de-informacoes-sobre-os-povos-indigenas-e-quilombolas.html

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA (IBGE). [Brazilian Institute of Geography and Statistics] **Censo 2022: Quilombolas: Primeiros resultados do universo**. [2022 Census: First results from the *Quilombola* universe] Rio de Janeiro, 2023. Available at: https://biblioteca.ibge.gov.br/index.php/biblioteca-catalogo?view=detalhes&id=2102016. Accessed on: Jul 28, 2023.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA (IBGE). [Brazilian Institute of Geography and Statistics] **Censo 2022: Indígenas: Primeiros resultados do universo**. [2022 Census: First results from the Indigenous universe]. Rio de Janeiro, 2023. Available at: https://biblioteca.ibge.gov.br/index.php/biblioteca-catalogo?view=detalhes&id=2102018. Accessed on: Aug 07, 2023.

INSTITUTO BRASILEIRO DE MINERAÇÃO (IBRAM). [Brazilian Mining Association] **Posicionamento IBRAM – Mineração em Terras indígenas**. [IBRAM Positioning – Mining in Indigenous Lands] 2022b. Available at: https://ibram.org.br/posicionamento-setorial/posicionamento-ibram-mineracao-em-terras-indigenas-2/. Accessed on: Oct 10, 2022.

INSTITUTO CLIMA E SOCIEDADE (ICS); [Institute for Climate and Society] O MUNDO QUE QUEREMOS. [The World we want] **Pesquisa Decisores da Amazônia**. [Amazon Decision Makers Survey] 2020. Available at: https://omundoquequeremos.com.br/wp-content/uploads/2020/11/Resultados-Pesquisa-Decisores-da-Amaz%C3%B4nia.pdf

INSTITUTO DE COLONIZAÇÃO E REFORMA AGRÁRIA (INCRA). [National Institute for Colonization and Agrarian Reform] **Áreas de Quilombolas.** [Quilombola Territories] 2020. http://certificacao.incra.gov.br/csv_shp/export_shp.py

INSTITUTO DE CONSERVAÇÃO E DESENVOLVIMENTO SUSTENTÁVEL DA AMAZÔNIA (IDESAM). [Institute for Conservation and Sustainable Development of the Amazon] **Programa Prioritário de Bioeconomia.** [Bioeconomy Priority Program] Superintendência da Zona Franca de Manaus (Suframa) [Manaus Free Trade Zone Superintendence], 2022. Available at: https://idesam.org/en/projetos/ppbio/. Accessed on: Oct 03, 2022.

INSTITUTO DO HOMEM E MEIO AMBIENTE DA AMAZÔNIA (IMAZON). [Amazon Institute of People and the Environment] **Sistema de Monitoramento da Exploração Madeireira (Simex):** mapeamento da exploração madeireira na Amazônia – agosto 2020 a julho 2021. [Logging Monitoring System (Simex): mapping of logging in the Amazon – August 2020 to July 2021]. Imazon, 2022. Available at: https://imazon.org.br/publicacoes/sistema-de-monitoramento-da-exploracao-madeireira-sim-ex-mapeamento-da-exploracao-madeireira-na-amazonia-agosto-2020-a-julho-2021/amp/. Accessed on: Jul 26, 2023.

INSTITUTO ESCOLHAS. **Uma Nova Economia para o Amazonas: Zona Franca de Manaus e Bioeconomia**. [A New Economy for Amazonas State: Manaus Free Trade Zone and Bioeconomy] São Paulo: Instituto Escolhas, 2019. Available at: https://concertacaoamazonia.com.br/estudos/uma-nova-economia-para-o-amazonas-zona-franca-de-manaus-e-bioeconomia-2/. Accessed on: Jul 24, 2023.

INSTITUTO ESCOLHAS. **Blockchain, rastreabilidade e monitoramento para o ouro brasileiro**. [Blockchain, traceability and monitoring for Brazilian gold] São Paulo: Instituto Escolhas, 2022b. Available at: https://www.escolhas.org/wp-content/uploads/Proposta-Rastreio-do-Ouro.pdf. Accessed on: Oct 10, 2022.

INSTITUTO IGARAPÉ. **Boletim Descontrole no Alvo 03**: Amazônia no Alvo. [Loss of Control on Target Bulletin #03: Targeting the Amazon] Rio de Janeiro: Instituto Igarapé, Jul 2022a.

INSTITUTO IGARAPÉ. **Governar para não entregar: uma agenda de Segurança Multidimensional para a Amazônia brasileira.** [Governing for not surrendering: a Multidimensional Security agenda for the Brazilian Amazon] Rio de Janeiro: Instituto Igarapé, 2022b. Available at: https://igarape.org.br/wp-content/uploads/2022/09/Agenda-de-Seguranca-Multidimensional-para-a-Amazonia.pdf. Accessed on: Set 27, 2022.

INSTITUTO IGARAPÉ. **Siga o Dinheiro: conectando sistemas de proteção contra a lavagem de dinheiro para combater a prática de crime ambiental na Amazônia.** [Follow the Money: connecting anti-money laundering protection systems to combat environmental crime in the Amazon] Artigo Estratégico 60. [Strategic Article #60] Rio de Janeiro: Instituto Igarapé, 2023.

INSTITUTO IGARAPÉ; INTERPOL. **Guia para o enfrentamento de crimes ambientais: lições do combate à mineração ilegal de ouro na Amazônia.** [Guide for tackling environmental crime: lessons from fighting illegal gold mining in the Amazon] Rio de Janeiro: 2021.

INSTITUTO NACIONAL DE ESTUDOS E PESQUISAS EDUCACIONAIS ANÍSIO TEIXEIRA (INEP). [National Institute of Educational Studies and Research Anísio Teixeira] **Relatório do 4º Ciclo de Monitoramento das Metas do Plano Nacional de Educação**. [Report on the 4th Assessment Cycle of the National Education Plan Goals] Report. Brasília, DF: Ministério da Educação, 2022. Available at: https://download.inep.gov.br/publicacoes/institucionais/plano_nacional_de_educacao/relatorio_do_quarto_ciclo_de_monitoramento_das_metas_do_plano_nacional_de_educacao.pdf. Accessed on: Jul 06, 2023.

INSTITUTO NACIONAL DE PESQUISAS ESPACIAIS (INPE). [National Institute for Space Research] **Estimativa de Desmatamento na Amazônia Legal para 2022 é de 11.568 km²**. [Estimated Deforestation in the Legal Amazon for 2022 is 11,568 km2] São José dos Campos, São Paulo, 2022. Available at: https://www.gov.br/inpe/pt-br/assuntos/ultimas-noticias/sei_01340-009084_2022_72_notatecnica_estimativa_prodes_2022_revisada_lu_lm_27_10_rev_la-002.pdf. Accessed on: Jul 26, 2023.

INSTITUTO SOCIOAMBIENTAL (ISA). [Socio-environmental Institute] **Demarcações nos últimos governos**. [Demarcations in the last administrations] 2020. Available at: https://pib.socioambiental.org/pt/Situa%C3%A7%C3%A3o_jur%C3%ADdica_das_TIs_no_Brasil_hoje. Accessed on: Jul 26, 2023.

JORDÃO, Georgia M. **A Política Nacional de Agroecologia e Produção Orgânica sob a perspectiva da abordagem Nexus água-energia-alimento: uma proposta para analisar e (re)integrar a política no Governo Federal.** [The National Policy for Agroecology and Organic Production from the perspective of the water-energy-food Nexus approach: a proposal for analyzing and (re)integrating the policy into the Federal Administration] Doctoral Thesis in Sustainable Development – University of Brasília, Brasília, 2023.

LE BLANC, D. Towards integration at last? The sustainable development goals as a network of targets. **Sustainable Development**, 23(3), 176-187, 2015.

LOPES, Cristina L.; CHIAVARI, Joana. **Bioeconomia na Amazônia**. Análise Conceitual, regulatória e Institucional. [Bioeconomy in the Amazon. Conceptual, regulatory and institutional analysis] Amazônia 2030 Project, n. 51, Set, 2022. Available at: https://amazonia2030.org.br/wp-content/uploads/2022/09/Bioeconomia-na-Amazonia-1.pdf. Accessed on: Jul 25, 2023.

LOTTA, G.; FAVARETO, A. **Desafios da integração nos novos arranjos institucionais de políticas públicas no Brasil**. [Integration challenges in the new institutional arrangements of public policies in Brazil] Revista de Sociologia e Política [Sociology and Politics Journal], v. 24, n. 57, Mar. 2016. Curitiba: UFPR. Available at: https://www.scielo.br/j/rsocp/a/6PNRfxxr9CBqBMBHK58b6Hx/#. Accessed on: Jul 25, 2023.

MACEDO, Gustavo. **Climate Security, the Amazon, and the Responsibility to Protect.** Brazilian Political Science Review, v. 15, n. 3, 2021. Available at: https://www.scielo.br/j/bpsr/a/TxkpwqsgHMWBjTZjzFkPdPp/. Accessed on: Jul 25, 2023.

MAPBIOMAS. **A expansão da mineração e do garimpo no Brasil nos últimos 36 anos. Destaques do Mapeamento Anual de Mineração e Garimpo no Brasil entre 1985 a 2020.** [The expansion of mining and prospecting in Brazil in the last 36 years Highlights of the Annual Mapping of Mining and Garimpo Activities in Brazil between 1985 and 2020] Projeto MapBiomas: Mapeamento da superfície de mineração industrial e garimpo no Brasil [MapBiomas Project: Mapping the surface of industrial mining and garimpo prospecting in Brazil], Collection 6. MapBiomas, 2021. Available at: https://mapbiomas-br-site.s3.amazonaws.com/Fact_Sheet_1.pdf. Accessed on: Oct 10, 2022.

MAPBIOMAS. **Fatos sobre o papel das Terras Indígenas na proteção das florestas**. [Facts about the role of Indigenous Lands in protecting forests] Mapbiomas, 2022. Available at https://mapbiomas-br-site.s3.amazonaws.com/downloads/Colection%206/Fatos_sobre_o_Papel_das_Terras_Ind%C3%ADgenas_18.04.pdf. Accessed on: Jul 26, 2023.

MAPA DE CONFLITOS. [Conflicts Map] **AM – Conflitos e falta de uma política adequada para a população indígena de Manaus**. [AM – Conflicts and lack of suitable policies for the indigenous population of Manaus] Neepes/ENSP/Fiocruz, 2023. Available at: https://mapadeconflitos.ensp.fiocruz.br/conflito/am-conflitos-e-falta-de-uma-politica-adequada-para-a-populacao-indigena-de-manaus. Accessed on: Jul 25, 2023.

MARTINS, Estevão C. de R.; MOREIRA, Felipe K. (org.). **As relações internacionais na fronteira norte do Brasil: coletânea de estudos.** [International relations on the northern border of Brazil: a collection of studies] Boa Vista: UFRR, 2008.

CHICO MENDES MEMORIAL (MCM). **Reservas Extrativistas**. [Extractivist Reserves] 2009. Available at: http://www.memorialchicomendes.org/reservas-extrativistas/. Accessed on: Jul 26, 2023.

MOLINA, Luísa; WANDERLEY, Luiz J. (orgs.). **O cerco do ouro: garimpo ilegal, destruição e luta em terras Munduruku**. [The gold siege: illegal mining, destruction and struggle in Munduruku lands] Brasília, DF: Comitê Nacional em Defesa dos Territórios Frente à Mineração [National Committee in Defense of Territories Against Mining], 2021.

NILSSON, M.; PERSSON, Å. **Policy note: lessons from environmental policy integration for the implementation of the 2030 Agenda.** Environmental Science

& Policy, v. 78, Dec, 2017, p. 36-39. SEI Stockholm, 2017. Available at: https://www.sciencedirect.com/science/article/abs/pii/S1462901117307116?via%3Dihub. Accessed on: Jul 26, 2023.

OBSERVATÓRIO DA ECONOMIA DA SOCIOBIODIVERSIDADE. [Observatory of the Economy of Sociobiodiversity] **Recomendações de políticas para o desenvolvimento da Economia da Sociobiodiversidade**. [Policy recommendations for the development of the Socio-biodiversity Economy] Brasília, DF: Observatório Da Economia Da Sociobiodiversidade, Jun 2022. Available at: https://www.socioambiental.org/sites/default/files/noticias-e-posts/2022-06/Propostas%20de%20Pol%C3%ADticas%20para%20Economia%20da%20Sociobiodiversidade%20-%20%C3%93SocioBio%20.docx%20%281%29_0.pdf. Accessed on: Jul 24, 2023.

OBSERVATÓRIO DO CLIMA (OC). [Climate Observatory] **Brasil 2045 Construindo uma potência ambiental** [Brazil 2045 Building an environmental powerhouse] Vol. 1 – Propostas para a Política Ambiental Brasileira em 2023-2024. [Proposals for the Brazilian Environmental Policy in 2023-2024] Suely Araújo (org.). OC, 2022. Available at: https://www.oc.eco.br/brasil-2045-construindo-uma-potencia-ambiental-vol-1/. Accessed on: Oct 13, 2022.

PÁGINA 22. **O valor da diversidade para a bioeconomia.** [The value of diversity for the bioeconomy] Página 22.[publication] Published on Feb 01, 2021. Available at: https://pagina22.com.br/2021/02/01/o-valor-da-diversidade-para-a-bioeconomia/. Accessed on: Jul 25, 2023.

PAOLIELLO, Tomás. **Quem é a Amazônia Legal – apontamentos sobre pessoas, fluxos e relações**. [Who is the Legal Amazon – notes on people, flows and relationships] Belo Horizonte: Alternativas Socioambientais (Also) [Socio-environmental Alternatives], 2020. Available at: https://concertacaoamazonia.com.br/estudos/quem-e-a-amazonia-legal/. Accessed on: Jul 26, 2023.

PEREIRA, Heloísa Corrêa *et al*. **Migração rural-urbana por demanda educacional no Médio Solimões, Amazonas**.[Rural-urban migration due to education demands in the Middle Solimões River, Amazonas State] Revista Brasileira de Educação [Brazilian Journal of Education], v. 27, 2022. Available at: https://www.scielo.br/j/rbedu/a/PDzJs8MPrtKWGn3LxbGLy7r/. Accessed on: Jun 21, 2023.

PESQUISA TIC Educação 2020 (TIC Educação). [2020 ICT Education Survey] **Resumo Executivo TIC Educação 2020**: Edição Covid-19 – metodologia adaptada. [2020 ICT Education Executive Summary – Covid-19 Edition – adjusted methodology] São Paulo: NIC.br, GCI.br, 2020. Available at: https://www.cetic.br/media/docs/publicacoes/2/20211124200731/resumo_executivo_tic_educacao_2020.pdf. Accessed on: Jul 24, 2023.

PINTO, Andreia *et al*. **Restauração Florestal em Larga Escala na Amazônia:** O Potencial da Vegetação Secundária. [Large-Scale Forest Restoration in the Amazon: The Potential of Secondary Vegetation] Amazônia 2030 Project, n. 04, Apr. 2021. Available at: https://amazonia2030.org.br/wp-content/uploads/2021/04/Restauracao-Florestal-AMZ-2030.pdf. Accessed on: Oct 03, 2022.

PROJETO VIDA DE NEGRO (PVN). [Black Life Project] **Terras de Preto no Maranhão: quebrando o mito do isolamento**. [Black Lands in Maranhão: Breaking the myth of isolation] Negro Cosme Collection – Vol. III. Centro de Cultura Negra do Maranhão – CCN/MA [Maranhão Black Culture Center] and Sociedade Maranhense de Direitos Humanos – SMDH [Human Rights Society of Maranhão]. São Luís, 2002.

RAJÃO, Raoni; SCHIMITT, Jair; NUNES, Felipe; SOARES-FILHO, Britaldo. **Dicotomia da impunidade do desmatamento ilegal**. [Dichotomy of impunity for illegal deforestation] Policy Brief, Jun, 2021. Belo Horizonte: CSR; LAGESA; UFMG, 2021. Available at: https://csr.ufmg.br/csr/wp-content/uploads/2021/06/Rajao_Schmitt-et-al_Julgamentos-IBAMA_final.pdf. Accessed on: Jul 26, 2023.

REDE AMAZÔNICA DE INFORMAÇÃO SOCIOAMBIENTAL GEORREFERENCIADA (RAISG). [Amazon Network of Georeferenced Socio-Environmental Information] **Amazônia sob Pressão.** [Amazon Under Pressure] RAISG, 2020. Available at: https://www.raisg.org/pt-br/publicacao/amazonia-sob-pressao-2020/. Accessed on: Jul 27, 2023.

REDE BRASILEIRA DE PESQUISA EM SOBERANIA E SEGURANÇA ALIMENTAR E NUTRICIONAL (PENSSAN). [Brazilian Research Network on Food and Nutritional Sovereignty and Security] **II Inquérito Nacional sobre Insegurança Alimentar no Contexto da Pandemia da COVID-19 no Brasil**: II VIGISAN: relatório final [II National Inquiry on Food Insecurity in the Context of the COVID-19 Pandemic in Brazil: II VIGISAN – Final Report], PENSSAN. São Paulo, SP: Fundação Friedrich Ebert: PENSSAN Network, 2022. Available at: https://olheparaafome.com.br/wp-content/uploads/2022/06/Relatorio-II-VIGISAN-2022.pdf. Accessed on: Oct 06, 2022.

REIS, A. C. er al. **Estudo de avaliabilidade do Sistema de Informação da Atenção à Saúde Indígena: potencialidades e desafios para apoiar a gestão em saúde no nível local**. [Study on assessment feasibility for the Indigenous Health Care Information System: potentialities and challenges to support health management at the local level] Cadernos de Saúde Pública [Public Health Journal], v. 38, n. 5, 2022.

RENNÓ, Fernanda. **Le Sertão Mineiro du Moyen Rio São Francisco** - Un territoire à la recherche de ses paysages e de ses identités. [The Sertão Mineiro of Middle São Francisco River - A territory in search of its landscapes and identities] Doctoral Thesis in Environment and Landscape. Université de Toulouse II. France, 2009.

RITTEL, Horst; WEBBER, Melvin. **Dilemmas in a general theory of planning.** Policy Sciences, 4, p. 155-169, Jun 1973. Available at: https://doi.org/10.1007/BF01405730. Accessed on: Jul 25, 2023.

ROCHA, R.; CAMARGO, M.; FALCÃO, L.; SILVEIRA, M.; THOMAZINHO, G. **A Saúde na Amazônia Legal: evolução recente e desafios em perspectiva comparada.** [Health in the Legal Amazon: recent developments and challenges in a comparative perspective] Amazônia 2030 Project, n. 20, Nov 2021. Available at: https://amazonia2030.org.br/wp-content/up-

loads/2021/11/A-Saude-na-Amazonia-Legal.pdf. Accessed on: Jul 23, 2023.

SAFATLE, Amalia. **Como ampliar a conectividade na Amazônia**. [How to expand connectivity in the Amazon] Página 22 [publication]. Published on June 12, 2022. Available at: https://pagina22.com.br/2022/07/12/como-ampliar-a-conectividade-na-amazonia/. Accessed on: Jul 24, 2023.

SANTOS, Fernando C. dos. **A securitização do narcotráfico na fronteira Amazônica.** [The securitization of drug trafficking on the Amazon borders] Revista GeoNorte, special edition 3, v.7, n.1, p.1007-1022, 2013.

SCHUTZE, Amanda; HOLZ, Rhayana; ASSUNÇÃO, Juliano. **Aprimorando a Zona Franca de Manaus**: Lições da Experiência Internacional. [Improving the Manaus Free Trade Zone: Lessons from International Experience] Amazônia 2030 Project, n. 07, May. 2021. Available at: https://www.climatepolicyinitiative.org/wp-content/uploads/2021/05/AMZ2030-Aprimorando-a-Zona-Franca-de-Manaus.pdf. Accessed on: Set 27, 2022.

SLAVE VOYAGES. **Tráfico transatlântico de escravos**. [Trans-Atlantic Slave Trade] Available at: http://www.slavevoyages.org/estimates/nGzJW54e. Accessed on: Jul 25, 2023.

SOARES, Daniel S.; CALMON, Miguel; MATSUMOTO, Marcelo. **Reflorestamento com Espécies Nativas:** estudo de casos, viabilidade econômica e benefícios ambientais. [Reforestation with Native Species: case studies, economic viability and environmental benefits] Coalizão Brasil, Clima, Florestas e Agricultura. [Brazilian Coalition on Climate, Forests and Agriculture] Published in Nov 2021. Available at: https://coalizaobr.com.br/wp-content/uploads/2023/05/Reflorestamento-com-especies-nativas-estudo-de-casos.pdf. Accessed on: Set 15, 2022.

SOARES, Rodrigo; PEREIRA, Leila; PUCCI, Rafael. **Ilegalidade e Violência na Amazônia**. [Illegal Activities and Violence in the Amazon] Amazônia 2030 Project, n. 26, Dec 2021. Available at: https://amazonia2030.org.br/wp-content/uploads/2021/12/Soares-Pereira-Pucci-Relato%CC%81rio-AMZ-2030-26.pdf. Accessed on: Oct 13, 2022.

STASSART, Joachim; TORSIANO, Richard; CARDOSO, Dário; COLLAÇO, Flávia. **Governança fundiária frágil, fraude e corrupção**: um terreno fértil para a grilagem de terras. [Weak land governance, fraud and corruption: a fertile ground for land grabbing] Transparência Internacional Brasil. [Transparency International Brazil] December 2021.

THE AMAZON CONCERTATION. **An Agenda for the Development of the Amazon**. São Paulo: Arapyau, 2021. Available at: https://concertacaoamazonia.com.br/estudos/uma-agenda-pelo-desenvolvimento-da-amazonia/. Accessed on: Jul 26, 2023.

THE AMAZON CONCERTATION. **The first 100 days of the government: proposals for an integrated agenda for the Amazônias.** São Paulo: Arapyau, 2022. Available at: https://concertacaoamazonia.com.br/100-dias/. Accessed on: Jul 26, 2023.

UNITED NATIONS (UN). **Transforming our World**: the 2030 Agenda for Sustainable Development. 2015. Available at https://nacoesunidas.org/pos2015/agenda2030/. Accessed on: Jul 26, 2023.

VASCONCELLOS, Mario B. de G. **Bioeconomia e o Mercado dos Produtos Florestais não Madeireiros**: desafios e possibilidades. [Bioeconomy and the Market for Non-Timber Forest Products: Challenges and Possibilities] São Paulo: Centro de Estudos Synergia [Synergia Research Center], 2023.

VERÍSSIMO, Beto; ASSUNÇÃO, Juliano; BARRETO, Paulo. **O paradoxo amazônico**. O desastroso processo de ocupação da Amazônia Legal nos oferece, atualmente, as chaves para a construção do seu futuro sustentável. [The Amazon paradox. The catastrophic process of occupation of the Legal Amazon currently offers us the keys to building its sustainable future] Amazônia 2030 Project, n. 50, Set, 2022. Available at: https://amazonia2030.org.br/wp-content/uploads/2022/09/ParadoxoAmazonia_AMZ2030.pdf. Accessed on: Set 29, 2022.

VIEIRA, Flávia do A; FALCÃO, Luísa. **Operações de combate ao crime ambiental na Amazônia**: dos desafios às boas práticas. [Operations to combat environmental crime in the Amazon: from challenges to good practices] Relatório Estratégico 08 [Strategic Report #8]. Plataforma Cipó, 2022. Available at: https://plataformacipo.org/publicacoes/operacoes-de-combate-ao-crime-ambiental-na-amazonia-dos-desafios-as-boas-praticas/. Accessed on: Jul 27, 2023.

WAACK, Roberto S.; FERRAZ, Thais; AHMAR, Vinicius; KRUGER, Laryssa. **Como atuar em rede para promover transformações sistêmicas**. [How to form a network to promote systemic transformations] São Paulo: Página 22 [publication]: 25 May. 2023. Available at: https://pagina22.com.br/2023/05/25/como-atuar-em-rede-para-promover-transformacoes-sistemicas/. Accessed on: Jul 25, 2023.

WAISBICH, Laura. *et al*. **O ecossistema do crime ambiental na Amazônia: uma análise das economias ilícitas da floresta.** [The ecosystem of environmental crime in the Amazon: an analysis of the forest's illegal economies] Instituto Igarapé, Artigo Estratégico 54. [Strategic Article #54] Rio de Janeiro: Instituto Igarapé, Feb. 2022. Available at: https://igarape.org.br/wp-content/uploads/2022/02/AE-54-O-ecossistema-do-crime-ambiental-na-Amazonia.pdf. Accessed on: Jul 24, 2023.

WORLD RESOURCES INSTITUTE (WRI BRASIL). **Nova Economia da Amazônia**. [The New Economy of the Amazon] São Paulo, Porto Alegre: WRI Brasil, 2023. Available at: https://www.wribrasil.org.br/projetos/nova-economia-da-amazonia. Accessed on: Jul 24, 2023.

WORLD-TRANSFORMING TECHNOLOGIES (WTT). **Bioeconomia amazônica**: uma navegação pelas fronteiras científicas e potenciais de inovação. [The Amazon bioeconomy: navigating through scientific frontiers and innovation potential] WTT, 2022. Available at: https://missaobioeconomia.com.br/wp-content/uploads/2022/08/WTT-Bioeconomia-Amazonica.pdf. Accessed on: Oct 08, 2022.

Annex

FUNGI *(Scientific name)*	**Occurrence**	**Description**	**Collection**	**Illustration**
Hyphae	-	Arts & Science, free representation of fungal networks.	-	
The Tree of Life	-	Art & Science, free representation of the Tree of Life, based on Margulis, 1982.	-	
Mycena cristinae	AM	Bioluminescent, dubbed “forest sparkles”, they indicate paths in the dark nights; they are also great recyclers of organic matter in their environment.	INPA	
Fungus structure	-	Art & Science, free representation of fungal and mycelium morphologies	-	
Geastrum inpaense	AM	Found in the Inpa area, they have a star shape; they grow in the soil and on leaves, and they do nutrient cycling and organic matter decomposition; species in this group are related with pharmacological active substances and with potential enzymatic degradation of waste. Discovered in 2014, the type locality of the species is in the state of Amazonas.	INPA	
Lentinula raphanica	AM/RR	Edible species and part of Yanomami cuisine; essential species for fungiculture projects – mushrooms that are edible and native to the Amazon, such as INPA’s. Discovered in 1943, the type locality of the species is in Florida.	INPA	
Schizophyllum umbrinum	PA /MA	Examples of this genus are widely distributed in terrestrial biomes and play a key role in the degradation of cellulose and lignin of woody plant materials and, therefore, in the cycling of nutrients and maintenance of ecosystems; they have divided lamella; it was essential to find out the sex of the fungi and for crossbreeding strains of S. umbrinum; discovered in 1851, the type locality of the species is in Pará state.	INPA	

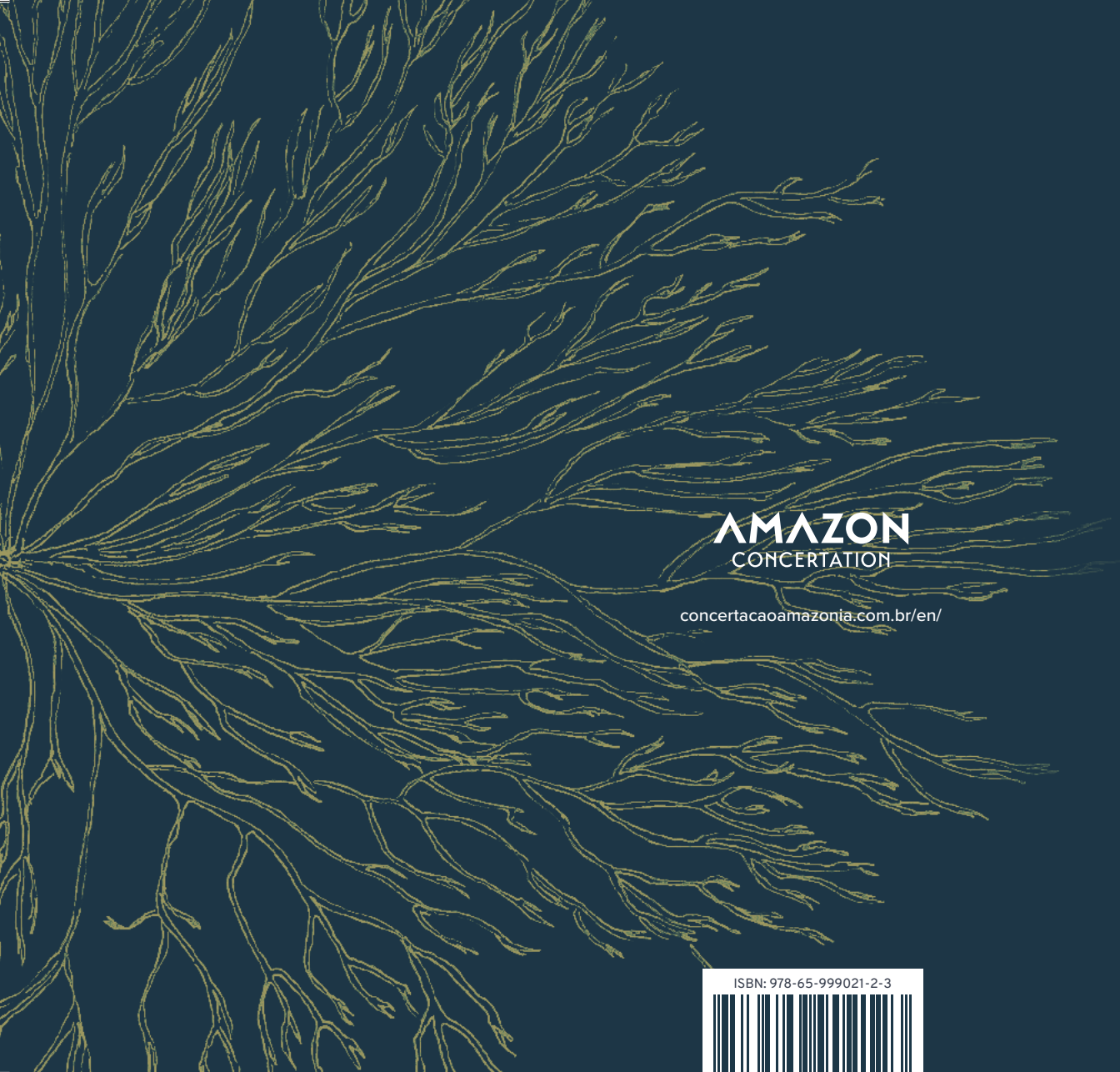
Gymnopus montagnei	AM/RO	Usually referred to as “little calla lilies”, the gymnopods are important decomposers of organic matter and play a crucial role in the cycling of nutrients; some species, such as the G. montagnei, have proven anti-inflammatory activity. Found in 1842, this species type locality is in Suriname.	UFPE	
Phallus indusiatus	PA/AM	Uniquely beautiful, this species has a central stem with a veil-like mesh; its odor attracts insects; scattered in several countries, they are edible, rich in proteins, carbohydrates and fibers; they have bioactive compounds, some of which with antioxidant and antimicrobial properties; studies show its importance to Chinese medicine. Found in 1798, the type locality of this species is in Suriname.	HSTM/ UFOPA	
Marasmius yanomami	AM	Rhizomorphs are known to be used by birds in their nestles. Rhizomorphs of M. yanomami are used by Yanomami women in basket ornamentation. Found in 2019, this species type is typically located in the Amazon.	INPA	
Marasmius amazonicus	AC / MT	This species was first collected in the Amazon by a German scientist; however, the samples stored in an herbarium were lost during World War II; In 2009, new representative species were obtained once again; of purple color and having small yellow stains, they are popularly known as “starry night”; they are decomposers that develop in dead plant matter, at high humidity. Found in 1904, the type locality of this species is in Amazonas state.	INPA	
Ophiocordyceps camponoti-atricipis	AM/RO	Commonly found in rain forests, they are famous for transforming ants into “zombies”, that is, they are entomopathogens that increase their chance of reproduction by taking insects as “hosts“; they recycle materials and can contribute to insect biological control techniques. Found in 2015, the type locality of this species is in Amazonas state.	INPA	
Panus strigellus	RR/AM	Edible and part of the Yanomami cuisine; studies conducted by the INPA aim to assess the best growth substrate of this species, favoring its production as food; research also ascertains their antimicrobial activity. Found in 1869, the type locality of this species is in Cuba.	INPA	
Cantharellus amazonenses	AM	Ectomycorrhizas, they form mutualistic relationships, absorbing nutrients for plant growth; they have bioactive properties, such as the production of protease and lipase enzymes. Discovered in 2012, the type locality of the species is in Florida.	INPA	
Favolus brasiliensis	PA/AM/RR	Edible and part of Yanomami cuisine; in the indigenous agricultural system, termed “slash and burn agriculture”, this fungus is collected from decomposing trunks, remnants of the scorching wood. Discovered in 1821, the type locality of this species is in the state of Pará.	INPA	

Sources: National Institute for Amazonian Research (INPA – https://www.gov.br/inpa/pt-br)* and SpeciesLink (www.cria.org.br). Collections National Institute for Amazonian Research (INPA); Federal University of Pernambuco (UFPE); HSTM – Herbarium of the Federal University of Western Pará.

The importance of fungi for the maintenance of forests and their potential for biotechnological use is indisputable. However, the number of research studies carried out in the field of mycology in the Amazon is inconsistent with the immense diversity of existing species in the Amazon Region.

Estimates suggest that there are about 3.8 million species of fungi unknown to science. Several researchers believe that most are found in tropical ecosystems, such as the Amazon rainforest [R. Vargas-Isla, 2012].

Brazil has about 5,719 species of fungi already cataloged, and 2,741 of these species belong to the phylum Basidiomycota, or fungi that produce mushrooms. Despite this high number of known species, the country does not escape the world pattern of commercial mushroom cultivation, and the main cultivated species are exotic. However, some species native to the Amazon region have shown potential to be commercially viable, such as the mushrooms consumed by the Yanomami people, who already sell more than 10 Amazonian species [Instituto Socioambiental, 2019 in Science and Technology, 41, 2021]



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