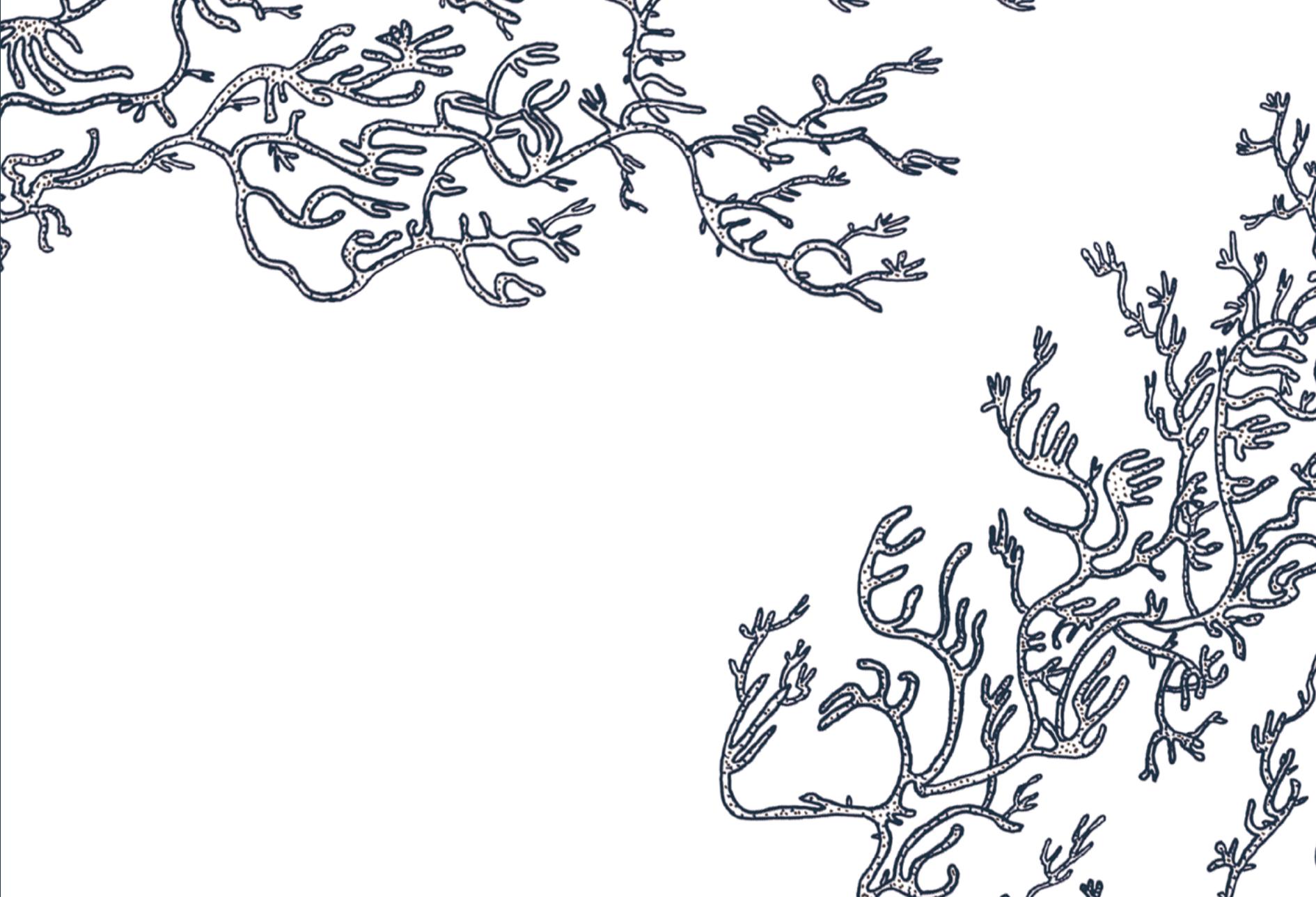


PART 2

# PROPOSALS FOR THE AMAZÔNIAS

AN INTEGRATED APPROACH TO THE DEVELOPMENT AGENDA



## Proposals for the Amazônias: an Integrated Approach to the Development Agenda

### General Coordination

Georgia Jordão  
Lívia Pagotto

### Content Coordination

Fernanda Rennó  
Georgia Jordão

### Executive Production

Joana Braga

### Content Development

Amália Safatle (Página 22)  
Clayton Peron  
Fernanda Rennó  
Fernando Gazzaneo  
Georgia Jordão  
Lívia Pagotto

### Thematic Curators:

#### Biodiversity

*Partner Organization*  
CRIA - Reference Center on Environmental Information

#### Authors

Fernando Bittencourt de Matos – *Biologist (CRIA - Reference Center on Environmental Information)*

Kildren Pantoja – *Socioenvironmentalist. PhD candidate in Sustainable Development at UnB and MS in Natural Resources Management and Local Development in the Amazon from UFPA. Specialist in Racial and Ethnic Relations from the Federal Institute of Education, Science and Technology of Pará (IFPA)*

Prof. Rosana Filomena Vazoller – *Biologist. Member of CRIA - Reference Center on Environmental Information and of the Governance Center at the Amazon Concertation*

#### Artwork

Anacardium (2024)  
by Josias Marinho

#### Listening Sessions

Angélica Mendes  
Cilene Oliveira Andrade  
Eliane Cristina Pinto Moreira  
Fernanda Stefani  
Irandilva Dantas (Pajé Roxita)  
João Neves Silva (Galibi-Marworno)  
José Jorge de Carvalho  
Mercedes Bustamante  
Raquel Tupinambá  
Roberto Klabin  
Sidarta Ribeiro  
Thiago Castanho

#### Cities

##### Authors

Eduardo Celestino Cordeiro – *PhD in Geography, Geographer at the São Luís City Administration and Adjunct Professor at the State University of Maranhão*

Helen Lorena Rodrigues Elias Cordeiro – *Literature and Languages BA and Master's student in Literature and Languages at the Federal University of Maranhão*

#### Artwork

Igapó 4 (2024)  
Adriana Ramalho

#### Listening Sessions

Alessandra Guajajara  
Ana Claudia Duarte Cardoso  
Aurea Maria  
Elisandra Cantanhede Ribeiro  
Flávia Fernanda Santos Silva  
Ingrid Fabiane Santos da Silva  
Luly Fischer  
Maíke Vieira

Maria de Jesus

Meiryelle Coelho Cantanhede

#### Cultura

*Partner Organization*  
C de Cultura

#### Authors

Jader Gama – *PhD in Socioenvironmental Development and Researcher at the Digital Culture Laboratory UFPR/MinC*

Jondison Rodrigues – *Post-Doctorate in Regional Development and Geography*

#### Artwork

Memórias de um caroço [Memories of a fruit pit] (2024)  
Hadna Abreu

#### Listening Sessions

Alexandre Pereira Araújo  
Anderson de Sousa Ferreira (Don Perna)  
Edjales Benicio de Brito  
Fernando Pimentel Canto  
Hiago da Silva Conrado  
Jonildo Viana dos Santos  
Josilene Brandão da Costa  
Liliane Araújo Maia Puyanawa  
Maickson dos Santos Serrão  
Maria de Nazaré da Cunha Figueiredo  
Mário Assunção do Espírito Santo  
Nayara dos Santos Ribeiro  
Núbia Pontes Fernandes (Núbia Dourado)  
Telma Saraiva dos Santos  
Thais Isabelle de Oliveira Cardoso  
Valcir Bispo Santos  
Willy Miranda Silva

#### Energía

*Partner Organization*  
International Energy Initiative - IEI Brasil  
Instituto de Energia e Meio Ambiente (Iema)

#### Authors

Clayton Peron Franco de Godoy – *Socioenvironmental consultant - Managing Partner at SocioLógica Projetos e Soluções Socioambientais Ltda. PhD and MS in Sociology (USP)*

Rodolfo Dourado Maia Gomes – *Executive Director at IEI Brazil*

Vinicius Oliveira da Silva – *PhD in Sciences, specialist in energy and public policy at the Institute for Energy and the Environment (IEMA) and assistant professor at the Energy Group of the Polytechnic School of the University of São Paulo (GEPEA-USP)*

#### Collaboration

Alessandra Mathyas – *Journalist, Specialist in renewable energies Conservation Analyst at WWF-Brazil*

#### Artwork

Energia ancestral [Ancestral Energy] (2024)  
Auá Mendes

#### Listening Sessions

Cacique Juarez Muduruku  
Daniela Pantoja  
Eva Canoé  
Fernanda Araújo  
Frank Akay Munduruku  
Gecivane Menezes  
Lucas Tupinambá  
Ricardo Aires  
Vanuza Cardoso  
Vicente Moreira

#### Ordenamiento Territorial y Regularización Fundiaria

*Partner Organization*  
Instituto Governança de Terras (IGT)

#### Authors

Gabriel Pansani Siqueira – *Director at IGT - Land Governance Institute, Facilitator of the Territorial Planning and Land Regularization WG at the Amazon Concertation and PhD Candidate at the University of Twente*

Vitor Bukvar Fernandes – *Director at IGT - Land Governance Institute and PhD in Economic Development from UNICAMP*

#### Artwork

As vozes da periferia [Voices from the Hood] (2024)  
Victor Hugo Reis

#### Listening Sessions

Adriana Coningham  
Humberto Mucuxi  
Ivanilde Salgado Santos  
João Paulo Santos Mastrangelo  
Luiz Antônio Nascimento de Souza  
Maxiely Scaramussa Bergamin  
Miguel Mônico Neto  
Pedrinho Gobi  
Ticiany Gedeon Maciel Palacio  
Valdevan Evangelista dos Santos Tembê

#### Sistemas Agroalimentares

*Partner Organization*  
Instituto Clima e Sociedade (ICS)

#### Authors

Georgia Jordão – *PhD in Sustainability Policy and Management, Knowledge Coordinator at the Amazon Concertation and Associate Researcher at the Center for Sustainable Development at UnB*

Kamyla Borges – *PhD in energy systems planning from UNICAMP, Specialist III in Food Systems and Agriculture at the Institute for Climate and Society*

Jader Gama – *PhD in Socioenvironmental Development and Researcher at the Digital Culture Laboratory UFPR/MinC*

Nara Pessoa – *PhD candidate in Communication, Culture and the Amazon (UFPA)*

#### Artwork

Mani (2024)  
Andreia da Silva

#### Listening Sessions

Célio José Pereira da Costa  
Ed Carlos Santana Tenório  
Fernanda de Araújo Moraes  
Justino Alvez Barbosa  
Kátia Gomes de Sousa Di Teodoro  
Mauro Lúcio de Castro  
Pedro Aquino de Santana  
Pricila Rodrigues de Almeida  
Tainá Paiva Godinho  
Tarcísio Silva Ferreira

#### Artworks

##### 2023 Structuring Themes

#### Bioeconomy

Teia da Vida [Web of Life] (2024)  
Silvana Mendes

#### ST&I

Xapiri Ancestral - plantação e colheita de novos mundos [Ancestral Xapiri - Planting and Harvesting New Worlds] (2024)  
Rakel Caminha

#### Education

Presentismos Amazônico, tudo está aqui [Amazonian Presentisms, Everything is Here] (2024)  
Kerolayne Kemblin (DaCorDoBarro)

#### Indigenous Peoples, Quilombolas and Traditional Communities

Tecnologias Ancestrais [Ancestral Technologies] (2024)  
Laíza Ferreira

#### Health

Nossa saúde está nas águas [Our Health is in the Waters] (2024)  
Bonikta

#### Security

MOÃ (2024)  
Gê Viana

#### Artistic Narration

Fernanda Rennó

#### Fungal Network Illustrations

Hadna Abreu

#### Editing

Clayton Peron  
Georgia Jordão

#### Proofreading

Diego Cardoso

#### Supplementary Review

Fernando Gazzaneo

#### Translation

Felipe Feitosa Castro  
Fernanda Villela Nunes

#### Graphic design and layout

Bruna Foltran

#### Infographics

Bruna Foltran  
Clayton Peron  
Fernando Gazzaneo  
Georgia Jordão  
Paula Sleiman  
Shake Soluções Visuais

#### Cataloging Librarian

Tatiane Dias

**AMAZON**  
CONCERTATION

#### Executive Secretariat

Lívia Pagotto

#### Governance

Andrea Azevedo  
Ane Alencar  
Angela Pinhati  
Atila Denys  
Beto Veríssimo  
Bia Saldanha  
Carolina Genin  
Denis Minev

#### Executive Production

Joana Braga  
Guilherme Leal  
Ilona Szabó

#### Support Team

Élidi Inoue  
Érica Dias  
João Pelozio  
Paulo Sena

#### Press Office

Pecan  
Comunicação

#### Digital

Malka Digital  
Bureau IT

#### Working Groups

Bioeconomy WG  
Education WG  
Youth WG  
Territorial Planning and Land Regularization WG  
Health WG

#### Team

##### Communications

Fernando Gazzaneo

##### Knowledge

Georgia Jordão  
Lívia Pagotto

##### Culture

Fernanda Rennó

##### Management

Paula Sleiman

# For a Thriving Amazon

Since 2020, the more than 800 members of the Amazon Concertation initiative have been working towards one goal: a more prosperous Amazon. And prosperity carries two major meanings. First, the advancement of citizenship, of local quality of life, and of a regard for people. Second, the strengthening of the region as a subnational space, with its political expression concerning the desired development paths, in integration with the ambition as to where Brazil wants to be in this climate, nature and digital-technological era. Among our network, we have been reflecting and finding that the way toward Amazonian prosperity will be paved to the extent that:

*We are able to create new imaginaries about the Amazônias.* It is impossible to imagine a future for Brazil without the past and present of the Amazônias in their various configurations, a new age comprising people and regional and transdisciplinary ideas in dialogue with the world. The rapid socioeconomic, political and institutional transformations and the numerous crises of the 21st century call for contemporary notions of development. Above all, they invite us to build a new political imaginary for the Amazônias and

think up new ideas that place people and nature as protagonists; a new imaginary where the value of the forest and of the quality of life of those who live there propel us to prosperous Amazônias. They also invite us to strengthen the region as an innovative subnational space and a protagonist of its own innovations.

*We turn an attentive look at Amazônia 1.0, the foundations for keeping the forest standing.* A healthy and lively Amazon Rainforest relies upon conditions for people to enjoy full citizenship rights as well as job opportunities and income generation. A large portion of the Amazônias, characterized by low levels of schooling, inadequate basic sanitation services and health care equipment and supplies, logistics bottlenecks, lack of Internet connectivity, high levels of violence, land conflicts, illegal activities, and sexual exploitation of children and adolescents, needs to be seen and prioritized. Much progress still needs to be made in public policies that promote basic rights in order to equalize the region's socioeconomic and environmental indicators with national average figures, or even to surpass these figures given the global importance of the Amazônias.

*We aspire to the Amazônias of people, of knowledge, of science and of technology.* Navigating and investing in the frontiers of Amazonian knowledge, education, science, technology and innovation will enable new discoveries, social solutions, productivity and new local economies that can produce and distribute wealth in the Amazon region. The rich socio-biodiversity heritage of the Amazônias can become a major source of wealth. The knowledge economy, creative economy, bioeconomies, urban economies, entrepreneurship and restoration of degraded areas are just some examples of activities that combine ancestral and current knowledge and techniques with desires for the future, through creative and collaborative processes. The immensity of the Amazônias offers plenty of room for so many things: from the extraction of raw nuts to sophisticated biofactories with cutting-edge technology, such as cloud computing, industrial automation and artificial intelligence.

*We combine environmental worth with fair economic value creation in the Amazon region.* Is it both desirable and possible to mobilize efforts to deliver greater green coverage to the next generation, with planted and restored forests, agroforestry systems, Integrated Crop-Livestock-Forestry (ILPF) systems, silviculture, and other productive arrangements? The so-called environmental might of the Amazon will reach its full potential if diversification and coexistence among productive arrangements at different scales translate into opportunities for generating em-

ployment and income for the region's residents. And it will be a sum of initiatives involving environmental services, production of healthy food, sustainable timber, high-value-added pharmaceuticals, cosmetics, among many others.

*The various Amazônias and their many movements become visible.* The diversity, the plural and at the same time unique character of the Amazon region keep it perennially in motion and invites us to constructive dialogue and coexistence, extrapolating dichotomies and simplistic solutions. There is always a need to consider the singularities of traditional and indigenous populations, as well as the particularities of Amazonian landscapes - including urban settings - and youth. Given the diversity of the Amazônias, there are multiple, complementary and interdependent paradigms and paths towards development. A plurality of paths is important: certain changes can take generations. The (political) movement in the Amazon revolves around generations and their ideas. The Amazônias are living systems: there are constant flows and exchanges between the natural and the human, between the past and the future, and among the urban, the rural and the forest environments.

*We create a contemporary and innovative vision for Brazil that includes the Amazon.* A new discussion in Brazil about the Amazon in the 21st century rests on what the region means and brings forward about our society, about itself and about the country. It has been common knowledge for decades that the Amazon region is essential for global climate security and for keeping

within planetary boundaries. But, above all, this territory is home and culture compass to its peoples and populations, in the various Amazônias. Today, the Amazônias are therefore able to outline a transformation in society's view on the relationship among nature, climate and people and how this relationship is connected with individual and collective well-being.

Enjoy your reading!  
**Lívia Pagotto**  
**Executive Secretariat**

#### *Auricularia delicata*

Because it resembles an ear, both the scientific name and many popular names used by various peoples refer to that auditory organ - from the Latin *auricula*. In the region of the Brazilian Amazon known as Cabeça do Cachorro (Dog's Head), in the municipality of São Gabriel da Cachoeira (Amazonas State), *A. delicata* is consumed and known as "agouti ear" or "bat ear". There are records of consumption by the Uitoto, Muinane and Andoke peoples of Colombia and the Hoti in Venezuela (Vasco-Palacios et al. 2008; Zent et al. 2004). Historical records indicate that species of the genus *Auricularia* were the first to be intentionally cultivated by humans, around the year 600 CE in China (Bertelsen, 2013). It is currently one of the five most cultivated genera in the world.



# Table of Contents

Executive Summary	13
The Amazon Concertation	16
An Integrated Approach in Practice	19
<b>An integrated Agenda: Themes and Initiatives</b>	<b>21</b>
Biodiversity	26
Cities	40
Culture	54
Energy	66
Territorial Planning and Land Regularization	80
Agri-food Systems	92
<b>Expanding Connections an Integrated Look at the Amazon Development Agenda</b>	<b>110</b>
Bioeconomy	116
Science, Technology and Innovation	120
Education	124
Indigenous Peoples, Quilombolas and Traditional Communities	128
Health	132
Security	136
<b>Starting Points, Dialogue and Tangible Actions</b>	<b>141</b>
<b>Acknowledgements</b>	<b>143</b>
<b>Notes</b>	<b>144</b>
<b>Acronyms</b>	<b>147</b>
<b>References</b>	<b>148</b>
<b>Annex</b>	<b>155</b>



## Executive Summary

This fourth document released by the Amazon Concertation presents a more comprehensive and ambitious agenda, with the aim of contributing for the region to thrive and prosper and assert their importance in the development of Brazil and the world. The Concertation understands Amazonian prosperity essentially as the advancement of citizenship, of people's well-being, of income generation, and the of the appreciation of natural capital.

This ambition will never be achieved through isolated or unilateral initiatives, but rather through concerted actions by widely diverse players, stakeholders and sectors, aligned around common goals. This spirit governs the actions of the Concertation, a network currently comprising more than 800 people from 300

organizations, from both within and outside the Amazon region, representing diverse groups with the most differing visions and views, but with common goals.

Governments, organized civil society, the private sector, academia and local populations, including artists and exponents of local culture, form a permanent environment for nurturing ambitions, guided by the integrated agenda detailed in this publication.

This agenda embraces the complexity of the Amazon region and perceives it as a unique place on the planet, one that is strategic for Brazil, fundamental for the world, for climate balance and for protection of biodiversity. While making space for plural opinions, the network combats the fragmentation of themes, envisioning a long-term structural change. This is no simple task.



*Favolus brasiliensis*

*Favolus brasiliensis* was described in 1821 by Swedish mycologist Elias Magnus Fries and named *Daedalea brasiliensis*. In 1830, Fries himself created and recombined the name under the genus *Favolus*. *Favolus brasiliensis* is called Waikasö amo, which means “white-skinned people” in the Sanõma language (one of the Yanomami languages), and is one of the most widely reported species in ethnomycological research in the Amazon (Sanuma et al. 2016). Button mushrooms are prepared as soon as they are harvested; they have a strong umami flavor and are soft. If dehydrated for storage, mature mushrooms become fibrous.

The context where the Concertation has been operating in its four years of existence is marked by challenges, added to an already complex local reality. Firstly, there has been a series of political setbacks in the Brazilian socioenvironmental agenda. More recently, the country has been suffering the consequences of extreme weather events, which have become even more pronounced. Frequent heat waves and historic droughts are bringing the Amazon Rainforest dangerously close to a point of no return, from which the humid tropical forest could give way to a savannah, with profound deprivations for the Amazonian peoples, for all of Brazil and for the world.

This makes taking action all the more urgent and reinforces the need for a comprehensive, integrated agenda to untangle critical knots regarding Amazonian issues, to catalyze resources for structuring initiatives and to strengthen institutional capacities of organizations and local governments in the Four Amazônias – which range from the most preserved forested areas to the teeming urban areas, including transition areas under pressure from deforestation, and others already converted by human activities.

This year, six new structuring themes were added to this agenda: Biodiversity; Cities; Culture; Energy; Land Tenure Regularization and Land Use Planning (OTRF) and Agrifood Systems. These themes interconnect with six others, already covered in the previous document, namely: Bioeconomy; Science,

Technology & Innovation; Education; Indigenous Peoples, Quilombolas and Traditional Communities; Health; and Security.

This document, therefore, provides a broader view, addressing a total of twelve themes regarded as structuring, because they continually mobilize public debate and can turn out to be obstacles or levers for the development of the Four Amazônias. Each of them puts forward their historical context, main challenges to be faced, and possible paths in the search for solutions.

The six new structuring themes were identified through the activation of the Concertation network, in seeking partners with knowledge and presence in the territories of the various Amazônias. Each theme brings together and integrates the knowledge of researchers with voices from the territory who bring in perceptions of their local realities.

It is the Concertation’s understanding that the combination of technical content with sensitive, attentive listening is a powerful tool for transforming the landscape, combining the collective imaginary with practical instruments so that dreams can be materialized.

Expert data is intertwined with artists’ *avant-garde* perspectives, thus forming an exploratory and creative exercise that values different knowledges, visions and worldviews. Accordingly, twelve Amazonian artists were invited to create a work based on their authorial interpretation of the structuring themes. These are pieces that not only illustrate the theme, but also propose a new

way of interpreting local realities.

This publication also includes infographics that make it possible to look at each of the twelve structuring themes and the connections among them in detail. The present document hereby expands on the content of the previous ones, reaching a new level of maturity regarding the debate and proposals developed over the last four years. The first document, *An Agenda for the Development of the Amazon*, was presented at the 26th United Nations Climate Change Conference of the Parties (COP26) in 2021. It was followed by the report *The First 100 Days of Government: Proposals for an Integrated Agenda for the Amazônias*. The third document *Proposals for the Amazônias – an Integrated Approach* consolidated and improved on the previous proposals.

At the current stage of knowledge building and proposed paths, the Concertation understands that the more integrated the agenda, the more resilient it becomes, as is the case with the fungal networks that pervade this new volume of Proposals for the Amazônias. The complex web of fungi that interconnects throughout the soil nourishes the life that flourishes on it.

The illustrations by artist Hadna Abreu featured in this publication continue to inspire the way the Concertation works: activating the synergy of these networks, so that results are always greater than the sum of individual efforts.

# The Amazon Concertation

## A Permanent Environment for Nurturing Ambitions to Bring the Amazônias into the Debate on Brazil's Development

Discussing and proposing paths for a region as multifaceted and challenging as the Amazon is a task that could only be accomplished through an integrated approach, one that acknowledges and values the interdependence of its elements. It was this spirit that brought people and organizations together in 2020 to form the Amazon Concertation network.

Members of organized civil society, academia and the public and private sectors, as well as exponents of local culture and art, created a permanent environment for nurturing and fulfilling ambitions, guided by an integrated agenda which embraces the complexity of the Amazon region and understands it as a unique place on the planet, strategic for Brazil and fundamental for the world and for climate balance. For these reasons, the Concertation aims to ensure that the Amazon region is considered in the debate on new development paths for the country.

Each year, the network consolidates its position, contributing to the maturation and qualification of public debate on sustainable and inclusive development models for the region, geared towards improving the quality of life of Amazonians. The Concertation congregates more than 800 people from inside and outside the Amazon territories. They represent diverse groups, with quite differing views, but with common goals. Some of these goals are driving convergence to untangle critical knots regarding Amazonian issues, catalyzing resources for structuring initiatives, and strengthening institutional capacities of local organizations and governments.

To this end, it understands the importance of promoting the association between scientific and traditional knowledge, and of strengthening the relationship between local cultures and environmental conservation. All this endeavor is meant to make the

Amazon region a reference in the reconciliation between the economy and nature while ensuring people's well-being, generating income and valuing natural capital.

The Concertation's efforts are not trivial. Inherently heterogeneous, the Legal Amazon occupies about 60% of the Brazilian territory, encompasses nine states and is home to nearly thirty million people who are diverse in every aspect. From the Concertation's perspective, the region is divided into at least four distinct Amazônias, ranging from the most preserved forested areas to teeming urban areas, including transition areas under pressure from deforestation, and others already converted by human activities.

Dealing with this context requires joint debate among the numerous players and segments of Brazilian society, in addition to Pan-Amazonian and international cooperation. This space of attentive listening and of exploring ideas is created through direct dialogue in which members of the Concertation share knowledge and practices on the twenty-one themes identified as essential to boost the development of the Amazônias. These themes are presented through the image of a spiral. This shape expresses a continuous and inexhaustible process of (re)cognition and deepening reflections:

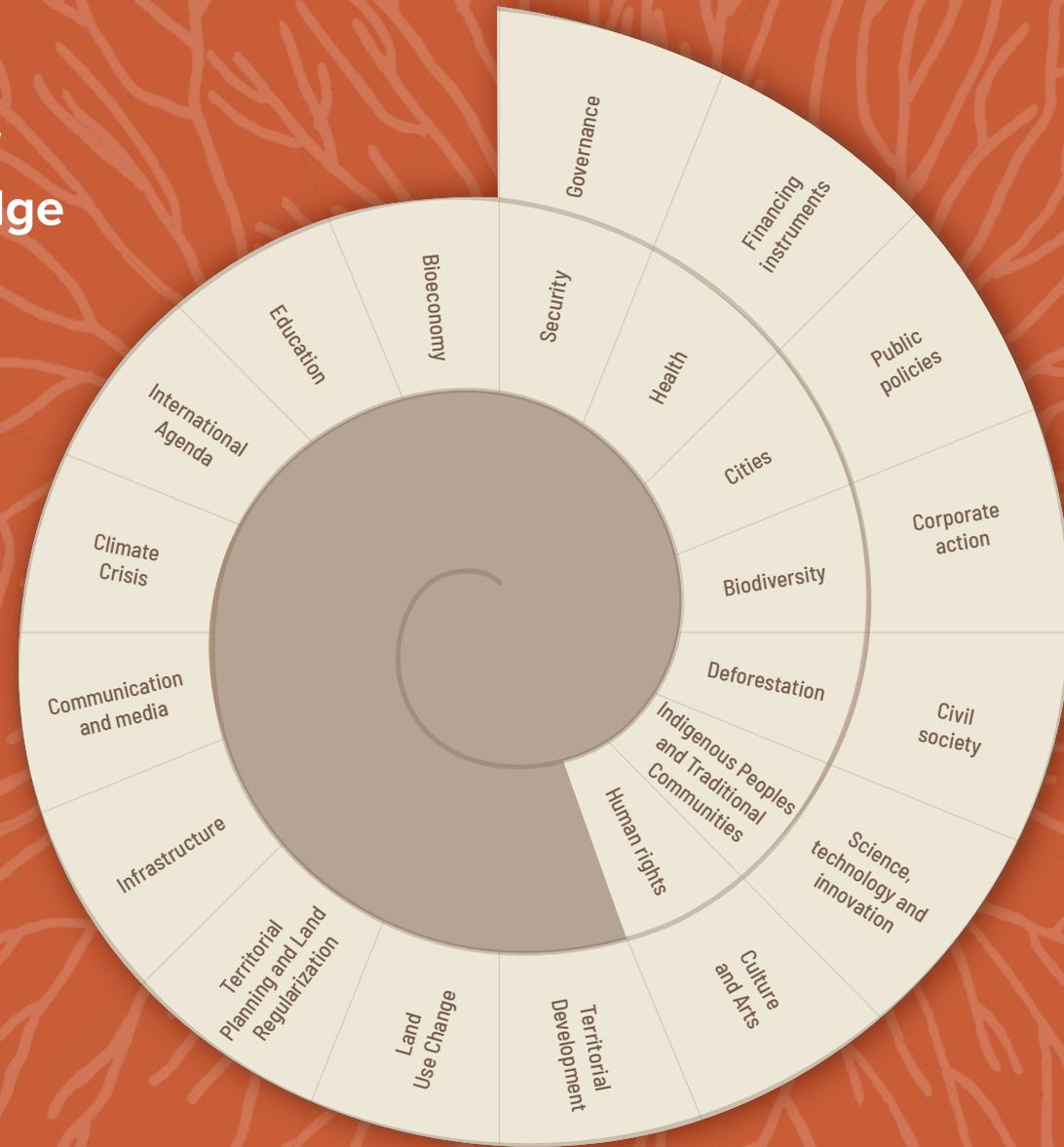
Discussions on some of these themes have advanced to in-

clude the creation of working groups (WGs). Currently, those WGs are geared towards bioeconomy, youth, education, territorial planning and land regularization, and health. Their regular meetings allow participants to share knowledge and practices, in addition to promoting a more comprehensive understanding of key issues, with the purpose of finding more efficient and appropriate paths for the development of the Amazônias.

In those groups, structuring initiatives are devised, developed and improved. An example of this is the *Amazon Itineraries* program, which provides free educational material and training for high school teachers, with the objective of bringing the Amazon to schools in all its environmental, social, historical, cultural, and economic complexity. Another highlight is the *Catalyst Land Fund* (FAF), created within the scope of the OTRF WG to expedite the land agenda and curb the advance of occupations and illegal deforestation and, thus, protect the forest and its peoples.

The Concertation periodically promotes meetings involving its participants, bringing together different voices and perspectives to qualify fundamental themes for the development of the Amazon and further engage the network. Concomitantly, the *Notas Amazônicas webinar* series fulfills the role of expanding knowledge about the Four Amazônias, actively engaging the general public.

## Spiral of knowledge



## An Integrated Approach in Practice

Equipped to accommodate different views without necessarily seeking consensus but rather a convergence of ideas, the Amazon Concertation intends to connect and weave the threads of this complex web of the Amazônias. In other words, while making space for plural opinions, the network combats the fragmentation of themes, envisioning a long-term, structural change for the region. And that was made possible through an integrated agenda.

This agenda was initially materialized through the publication *An Agenda for the Development of the Amazon*, presented at the 26th United Nations Climate Change Conference of the Parties (COP26), in Glasgow, Scotland, in 2021. That was the document in which the Concertation proposed that the Legal Amazon be regarded as Four Amazônias, so as to encompass – and embrace – the complexity and diversity of its territories. The document also identified key themes for the regional development agenda and listed strategies to move forward in this direction.

The Agenda then gave rise to the report *The first 100 of govern-*

*ment: proposals for an integrated agenda for the Amazônias*. In that report, a series of proposals regarding normative instruments for different themes on the agenda, prepared based on listening to various stakeholders in Brazilian society, were presented to the new government administrations, elected in 2022. The publication 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 ensuing document, *Proposals for the Amazônias: An integrated approach* (2023), explored the importance of key interconnections needed to support and sustain socioenvironmental ecosystems. This visual narrative, guided by fungal networks, is linked to the publication’s effort to identify relevant connections among structuring themes for an Amazonian development agenda. A deeper dive into these themes and the need to qualify and connect with contemporary debate motivated the creation of the *Cadernos da Concertação* (Concertation Notebooks) series, with six released volumes: *Education, Bioeconomy, Indigenous Bio-*

*economy, Science, Technology and Innovation (ST&I), Indigenous Peoples, Quilombolas and Traditional Communities, and Biodiversity.*

Just like fungal networks, which constantly connect and nurture communication among living beings, the current publication presses on with the objective of maintaining the dialogue-building processes among players, the systematization of relevant information and the dissemination of knowledge about the Amazônias in all their complexity.



# AN INTEGRATED AGENDA: THEMES AND INITIATIVES

## Pillars

### Development

Understanding development perspectives that could curb environmental degradation, reconciling natural capital and social justice.

### Business

Comprehension of the relevant role of Amazonian businesses, with the potential to position the region at the heart of the country's development.

### Governance

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

### Institutional

Strengthening of institutional capacities of state and non-governmental organizations.

### Culture

Essential element that connects technical knowledge with a sensitive dimension.

# A More Comprehensive View of the Integrated Agenda

Nature teaches us that a humid and healthy forest is unlikely to burn. The more protected the soil is, thus sustaining the cycling of nutrients and water, the more resilient forests will be. In the humid and nutrient-rich soil of conserved forests, an underground network keeps life beneath our feet: these are the fungal networks, formed by delicate structures invisible to the naked eye but able to create the conditions for vegetation to grow in all its exuberance, sheltering exceptionally diverse species and providing the basic conditions for the well-being of people.

Extreme events, increasingly visible in the form of fires, droughts, storms and devastating floods, underline the urgency of caring for all forests, especially the Amazon, so that their sheer existence can protect and safeguard the planet's biodiversity and climate, which are fundamental to life on Earth. This concern precedes a perspective on the relationships between people and nature and, much like fungal networks, requires an integration

and combination of forces capable of galvanizing the actions needed for humanity to save itself as well as all species.

It is with this inspiration, materialized in the drawings by artist Hadna Abreu, that The Amazon Concertation introduces a new series of illustrations on fungi, following those included in our 2023 publication – *Proposals for the Amazônia – an Integrated Approach*. The new images featured throughout this document reinforce the need to broaden this integrated approach to include other themes for the Network's activities in the Amazon territory, uncovering more connections and interdependencies in the relationships among people, time, and the space they occupy.

This year, six new structuring themes were identified as relevant to the Four Amazônia framework and have become part of this agenda: **Biodiversity; Cities; Culture; Energy; Land Use Planning and Land Tenure Regularization (ORTF); and Agri-food Systems**, interconnecting with other themes already addressed

in the previous document - **Bioeconomy; Science, Technology & Innovation; Education; Indigenous Peoples, Quilombolas and Traditional Communities; Health; and Security.**

This second volume, therefore, provides a more comprehensive view, addressing a total of twelve themes regarded as structuring, because they continually mobilize public debate and can turn out to be obstacles or levers for the development of the Amazon region. All themes are analyzed together in this publication so as to qualify the discussions on how they interrelate.

In seeking to identify the importance of the six new themes, the Concertation activated its network in search of partners with knowledge and presence in the territories of the various Amazônias. For Biodiversity, we had the technical supervision of the Reference Center on Environmental Information (CRIA) and of researchers from that institution and from the University of Brasília (UnB). For Cities, we had researchers from the State University of Maranhão (UEMA); for Culture, we had a technical partnership with the organization 'C de Cultura' (C for Culture) and with researchers from the Federal University of Pará (UFPA). For Energy, we counted on the support of the International Energy Initiative (IEI) Brazil, the Institute for Energy and the Environment (IEMA), and WWF-Brazil. Finally, for OTRF our partners were the Land Governance Institute, and for Agri-food Systems, the Institute for Climate and Society (ICS) and the Federal University of Pará (UFPA).

### **Knowledge and Culture Walk Hand in Hand**

In this publication, the knowledge gained by researchers is integrated with culture and expert inputs, and imbued with voices from the territories. The Concertation understands that the combination of technical content with perceptions, attentive listening and cultural elements is a powerful tool for transforming the landscape, as it triggers a collective imaginary about the Amazônias we want, while providing the instruments for those dreams to materialize.

Regarded as the way in which we organize ourselves, express our ideas and assign meaning to our actions, whether individually or within a community, culture modifies spaces and builds territories. There is no human relationship that is not mediated by cultural elements, and hence this dimension needs to be absorbed beyond its still important aesthetic and entertainment aspects; it also represents a source of information, one that can raise awareness and engage people and organizations.

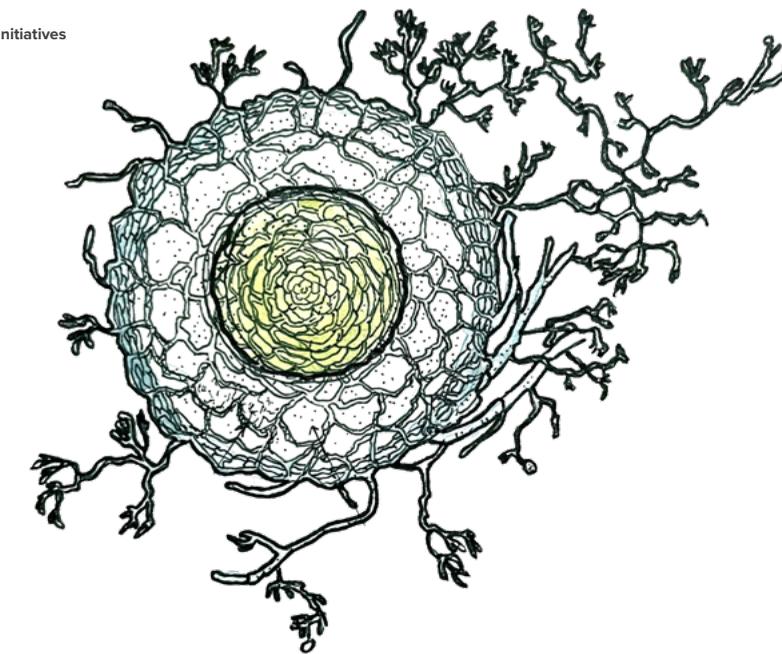
The publication's thematic units thereby systematize data from different organizations and findings from active listening involving around ten people per theme, including experts and voices from the territory coming from different states in the Amazon and in Brazil. These are people who play distinct roles in the Amazon biome and present the contexts of major issues related to that theme in the region. The mapping of perceptions on the themes from the territories and from various places in the country reveals

connections with the Amazon territory and beyond. For this reason, findings from testimonials and accounts are referenced by the municipality and the State.

Culture produces a sensitive narrative, in which data and facts meet life stories and local perceptions, and meanwhile art has its space to illuminate a systemic and more integrated view of the Amazônias. Accordingly, this document highlights the participation of local artists, who express the realities and complexities of the Amazônias like no one else. The Concertation invited 12 Amazonian artists to create a work based on their authorial interpretation of the twelve structuring themes. These artistic pieces not only illustrate elements and perceptions associated with each theme, but also propose a new perspective, a unique way of reading local realities.

The content is further enhanced by infographics that make it possible to look at general information about each of the twelve structuring themes. To this end, technical data from public sources and organizations with expertise in each given subject was systematized.

The connections from each of the themes can be seen in the inter-thematic networks, whereas the connections among the structuring themes are outlined in the general network. In the general network, specific centralities can be observed, which indicate priorities and point to investments likely to promote advances and co-benefits for the others, in addition to orbiting



themes that are also relevant and may become new structuring themes or the object of complementary studies.

In this publication, technical data coexist with voices from the territory and with the characteristic forward-thinking spirit of the artists, to compose an exploratory and creative exercise of appreciation for different knowledges, conversations, and exchanges, of presenting perspectives, worldviews and convergences that are essential for imagining a desirable present and desirable futures for the Amazônias.

01

# Biodiversity



---

---

## Anacardium, 2024

Josias Marinho

In addition to his love for animals, Josias' work and research entail a process of affection, memory and marking his place of origin and how he deals with all that. This mixed media artwork is like an annotation, since it is about recollections. When you recall a memory, you tell it, you record it in some way, you automatically contaminate that version of the memory of the story. The anaconda, which along with other elements here represents biodiversity, both abundant and fragile, is an animal that is always present in the imaginary on the Amazon; it is frightening and it feeds myths. The myths of foundation, of creation, make us think about the world around us; in biodiversity, the anaconda occupies this place.

---

---

The Brazilian Amazon, often imagined as a vast, flat region covered by a homogeneous, humid rainforest, is in reality a complex mosaic of different landscapes and types of vegetation. This diversity unveils the complexity and wealth of that region, ranging from dryland forests to areas of rupestrian grasslands and campinaranas<sup>1</sup>, including igapó forests, floodplains and even mountains, coral reefs and mangroves.

Some areas are still little known or studied, such as the Great Amazon Reef System. Only recently discovered, it is an area of outstanding marine biodiversity that extends along the coasts of Pará and Maranhão states, and is essential for the maintenance of this biodiversity, constituting a unique ecosystem in the region (BANHA et al., 2022).

*“Because when people enter a forest, for those who don't know it, they think it has no importance at all, it's just bush, bush, bush. But it's extremely important, because if you study each of the herbs you find, you'll discover that each one has enormous healing potential, because we often use the bark of a given tree for one type of disease, then we find another tree there, we do another study on it, and then it's useful for something else, for another type of disease” (Soure/PA).*

With its vast expanse of tropical forests, the Amazon is one of the planet's major biodiversity reservoirs. This region is home to an astonishing variety of species of plants, animals, fungi and

microorganisms, many of which have not yet been cataloged by scientists. The biodiversity of the Amazon continues to represent a huge scientific frontier, with many rare and sparsely distributed species still waiting to be discovered and employed for human nutrition and for the development and production of essential and innovative drugs (MYSTER, 2016; IPBES, 2019).

### To Know is to Preserve

The term biodiversity first appeared in the 1980s, as a synonym for the expression “biological diversity” (SARKAR, 2021). Broadly speaking, it refers to the variety of life on Earth, encompassing all its ecosystems, species and genes. Or alternatively, as Thomas Lovejoy pointed out in 1997<sup>2</sup>, biodiversity comprises much more than the total number of species on the planet, it includes the genetic diversity within species, in habitats and in large biological units, the biomes. The interactions among species within ecosystems – primordial relationships that shape the environment in countless ways – are also pieces that compose biological diversity. It therefore becomes necessary to acknowledge the dimension of this natural asset. Any decline in the quantity or quality of an environmental asset over time directly affects the sustainability of society and the value of nature.

Although enormous amounts of time, money and effort are invested in finding life on other planets, it is still not known

how much life (i.e. how many species) exist on our own. *“The population is unaware of the importance of biodiversity; the population is unaware of the impact it has on climate issues”* (São Paulo/SP).

To say that “no one knows” might seem far-fetched, but existing estimates vary dramatically, from 2 million to 3 trillion. One of the most accurate and widely accepted estimates by the scientific community indicates that the Earth is home to 8.7 million species, of which only 1.2 million have been described (Mora et al., 2011). However, recent analyses of environmental DNA, especially in prokaryotes (bacteria and archaea) and fungi have revealed hidden biodiversity, suggesting that the number of species on Earth is significantly higher (WIENS, 2023).

### **Brazil, a Protagonist in this Matter**

The Amazônias contribute to Brazil’s taking on a leading role in this matter, as it leads the list of the 17 most megadiverse countries in the world (BIODIVERSITY A-Z, 2024). Estimates indicate that the country is home to nearly 15% of all global biodiversity, with at least 125,138 animal species, 44,362 plant species (including algae) and 8,193 fungal species recognized to date.

Furthermore, it has high rates of endemism, with around 20% of its animal species and approximately half of its plant species not occurring anywhere else in the world (UNITED NATIONS,

2020). This vast biodiversity can be attributed to a unique combination of geographic, climate and historical factors. A complex hydrographic network, varied soils and diverse topography contribute to this wealth of ecosystems.

### **The Value of Amazonian Biodiversity**

This diversity of Amazonian landscapes and ecosystems helps support human life in the country and around the world. The region’s ecosystems provide essential ecosystem services, such as climate and hydrological cycle regulation and carbon storage, and are fundamental for the subsistence of many local communities and to the rainfall regime that serves all of central-southern Brazil.

Amazonian biodiversity is also a vital resource for the entire world and a field where it is possible to devise economic strategies connected to the living forest, creating prosperity for local communities. *“The Amazon used to be our backyard and there you could get antioxidants, thickeners, antifungals, that is, a series of products that today are chemically manufactured. Nowadays, of course, there are large chemical companies selling these in a package... but they [the products] are available in nature. But one needs to know where to get it and how to get it. And what to do with it. So, the importance of sociobiodiversity is that it represents our future. Without socio-*

*biodiversity, without biodiversity, there is no planet and there is no society”* (Belém/PA).

The conservation of biodiversity also has proven positive effects on mental health and well-being, reducing stress. There are implications for democracy as well, as people begin to consider the protection of sociobiodiversity as a right (SECRETARIAT OF THE CONVENTION ON BIOLOGICAL DIVERSITY, 2020). *“It’s a collective fight, because keeping the forest standing is important for humanity. So even in cities we can do our part and understand that a standing forest, that this sociobiodiversity also provides us with a safe, balanced environment, which is our constitutional right. Understanding this is linked to politics, right? So, I think it is important for people to start realizing that their vote is a tool that can help this sociobiodiversity”* (Rio Branco/AC).

The conservation of this diversity is fundamental not only for the Amazon, but for human health against direct threats and for the environmental balance of the planet (IPBES, 2019). The negative effects of the degradation of the Amazon have an impact that goes far beyond its borders, affecting biodiversity and human health in other parts of the world (FERRANTE et al., 2022; ZEMP et al., 2014). The degradation of the natural environment, combined with the lack of adequate infrastructure and poverty, worsens the spread of diseases. *“Primarily for forest peoples, indigenous peoples, traditional communities, but we must also*

*consider that there are people in urban contexts who are more vulnerable when we talk about this climate catastrophe”* (Rio Branco/AC).

Local communities, often with limited access to basic sanitation and health services, are disproportionately affected, and the result is high morbidity and mortality rates. *“Because if forests disappear, many people will die. Because if we heal with the help of nature, with the plants that are there in the middle of the forest, with its destruction, where will we heal? Many people will die from too much heat. And many people will die due to the lack of healing through nature”* (Soure/PA).

### **Threatened Biodiversity**

The ecosystem integrity, however, is threatened by activities such as illegal mining, expansion of agricultural lands, unchecked urbanization, unsustainable livestock farming and large infrastructure projects. These activities have led to significant loss of forest cover, *habitat* fragmentation and environmental degradation, resulting in reduced ecosystem resilience and loss of biodiversity (LAPOLA et al., 2023).

Environmental degradation in the Amazon has profound impacts on traditional communities, who directly rely on biodiversity for their survival and well-being. The destruction of forests and other natural habitats compromises their sources of food, water

*Pleurotus djamor*

This species was collected by Dutch naturalist Georg Eberhard Rumphius as *Agaricus djamor* Rumph. ex Fr. and described in 1821 by Swedish mycologist Elias Magnus Fries. The current name combination was published by Dutch mycologist Karel Bernard Boedijn in 1959. The type locality of collection was on the island of Amboina/Maluku, currently known as Indonesia. The species, commonly known as salmon mushroom due to the color of the basidiomata, is cultivated worldwide. It is consumed by the Yanomami of the Sanóma group of the Awaris region, Roraima State, and they call these mushrooms *Hiwala amo*, which means “porcupine” (Sanuma et al. 2016). It is also consumed by the Matsigenka peoples in the Shipetiari region of the Manu Reserve in Peru (Dávila-Arenas et al. 2013) and by the Secoyas and Sionas peoples of the Sucumbios region in Ecuador (Gamboa-Trujillo et al. 2009).

and medicinal resources, in addition to threatening their culture and way of life (WAISBICH, L. T. et al., 2022).

Furthermore, illegal deforestation and environmental degradation lead to increased violence against forest peoples and environmental officers. The environmental crime ecosystem in contemporary Amazon involves multiple players and employs complex methods of fraud and corruption, leading to increasing manifestations of violence (INSTITUTO IGARAPÉ AND INTERPOL, 2021; MOLINA AND WANDERLEY, 2021).

### The Role of Partnerships

In this context, there is an urgent need to coordinate actions taken to conserve the biodiversity of the Amazon, bringing together the most diverse existing initiatives. “*We need to recognize what we have here right in front of us as a global strategy, a survival strategy, which is biodiversity.*” (Belém/PA).

The agenda of science applied to biodiversity conservation has been strengthened with the creation of research institutions such as the Museu Paraense Emílio Goeldi and the National Institute for Amazonian Research (INPA). Other institutions, such as the State University of Amazonas (UEA), the Federal University of Pará (UFPA), the Federal University of Acre (UFAC), Embrapa Eastern Amazon, the Mamirauá Institute for Sustainable Development, the Vale Institute of Technology, the Juruá Institute, and the

Peabiru Institute, are fundamental to the advancement of knowledge regarding Amazonian biodiversity.

Several international initiatives and partnerships have been playing key roles, including NASA’s monitoring programs - Landsat Science - to track changes in forest cover and biodiversity in the region, and the Partnership to Conserve Amazon Biodiversity (PCAB), a partnership between Brazil and the United States Agency for International Development (USAID), which has supported conservation projects and promoted sustainable development in the Amazon since 2014 (Duke Research Funding).

The World Bank, through the Amazon Sustainable Landscapes (ASL) Program, finances initiatives to improve the management of 82 million hectares of forests in the Amazon, engaging Brazil, Colombia and Peru (World Bank). Finally, the Amazon Fund, managed by the National Bank for Economic and Social Development (BNDES) and financed mostly by Norway and Germany, is the main cooperation tool used by Europe to invest in biodiversity conservation projects in the Brazilian Amazon.

Other international organizations that are joining forces for the biodiversity conservation agenda are the World Wide Fund for Nature (WWF), the International Union for Conservation of Nature (IUCN), The Nature Conservancy (TNC), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the German government’s international cooperation agency, the New York

Botanical Garden, the Kew Gardens and the American Museum of Natural History.

### Integration of Knowledges

Yet, all this scientific knowledge still needs to be integrated with local and traditional knowledge. Such integration is essential for the advancement of effective biodiversity conservation strategies and is perhaps one of the most serious challenges to be faced in expanding knowledge on the subject.

Indigenous and riverine communities have a profound knowledge of the region’s fauna, flora and ecosystems. “*I see the largest tropical forest in the world not only as a treasure trove of biological, biochemical, physiological and pharmacological riches, but also as an extraordinary treasure trove of cultural gems. And what’s more: I see that the native peoples not only have the knowledge required to walk through this forest and know how to create a future in it, while it is still standing, but in some way, they also show the type of behavioral disposition that we need to adopt as a nation to create this future*” (Natal/RN).

Ancestral knowledge includes sustainable management of natural resources, which are vital for the preservation of biodiversity and human life on Earth. These communities have a cosmology that is fundamental for the conservation of local ecosystems (GARNETT et al., 2018). “*I believe that when we think about so-*

*cial diversity, indigenous peoples and the Amazon, it is important to remember that indigenous peoples have been living in the Amazon for at least 13 thousand years. I am talking about the Brazilian Amazon, this region here in Brazil. So, we have occupation records, and it is important to say that these peoples, our ancestors, were doing science and creating technology, developing human processes, domestication processes, as science says, processes of knowledge really, of knowledge generation” (Santarém/PA).*

*“So, our knowledge is very important for the surrounding society. The issue of food, the issue of production, the issue of diversity, the issue of forest preservation, for example. Why is our Indigenous Land currently more conserved? That is why: we have a great deal of knowledge and this impacts the non-surrounding society” (Oiapoque/AP).*

Indigenous Lands, which occupy a large portion of the Amazon, have proven to be more effective in conserving biodiversity than many established protected areas, thus highlighting the importance of guaranteeing these populations’ rights to their territory for the sake of environmental conservation (IPBES, 2019; MAPBIOMAS, 2024). *“(…) today’s greatest technologies from an environmental point of view, for instance, are related to traditional knowledge, with conservation specialties in parks, in areas to be protected, we know that today, and it is also attested and*

*proven, these are areas that have been managed historically and they are still there, well conserved, and they can ensure our quality of life thanks to the traditional knowledge that was implemented in this relationship” (Ananindeua/PA).*

Consolidating the participation of indigenous peoples, quilombola populations and traditional communities in the development of science, and engaging the private sector, which is present in the territory, in the formulation of and decision-making regarding public policy are key factors to leverage long-lasting conservation strategies (UMA CONCERTAÇÃO PELA AMAZÔNIA, 2023; SPA, 2021).

*“I would put it this way: biodiversity has to come together with the communities, with the representatives of these communities, the masters, the knowledgeable” (Brasília/DF). “The important thing is to promote favorable conditions so that these rural landowners sit down to talk and cooperatively analyze the impacts of their activities in areas of the Amazon that are extensive (...) I am talking about the effectiveness of a joint effort to understand how effective some model areas have been, and they can connect with other areas through [ecological] corridors as well” (São Paulo/SP).*

Organizations such as the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Convention on Biological Diversity (CBD) recognize the importance of inte-

*grating scientific knowledge with traditional knowledge and recommend launching efforts to engage local communities in the management of their natural resources. “But all this knowledge, as it is very sophisticated, the white people have never understood the grammar behind this knowledge. (...) We have to bring this forward through a pedagogical process so that people understand what it is about. I think we must first have an introduction. Perhaps we are at this moment of having an introduction” (Brasília/DF).*

Collaborations between scientists and indigenous communities result in innovative conservation projects, such as protected areas managed by indigenous leaders and sustainable agroforestry practices, which can be crucial at this historic moment. *“Today, the greatest technologies from an environmental point of view have to do for instance with traditional knowledge, with particularities in the conservation of parks and areas to be protected. We now know, and it is scientifically proven, that areas that were managed historically are still there, are conserved and ensure our quality of life thanks to the traditional knowledge that has been implemented in this relationship” (Ananindeua/PA).*

*“We experience this process of denial and inferiorization of our knowledge all the time. For this reason, as indigenous academics and indigenous researchers, we need to also bring*

*some of this to academia. For a long time, indigenous peoples and other Amazonian cultures have been researched and brought to academia without referencing the peoples themselves. We are very concerned about this type of relationship, this approach that academia has been adopting for a long time and that it still does today. This relationship has changed a lot, but there is still this view on indigenous peoples, on traditional peoples, as inferior, as lesser, as having lesser knowledge. So, as an indigenous researcher, I have also been working on this topic, and we, together with my people, combine our knowledge with a little of this academic knowledge to develop new products” (Santarém/PA).*

Although advances have been made and although it is considered a key point for the success of structuring initiatives, collaboration between traditional peoples and communities and academia can only be truly fruitful when these different knowledges recognize each other as legitimate.

## Biodiversity

Brazil is at the top of the list of the 17 most megadiverse countries in the world. It is estimated that a spoonful of soil from the Amazon can contain up to **1,800 microscopic life forms, 400 of which are fungi.**

Source: RITTER et al., (2020)

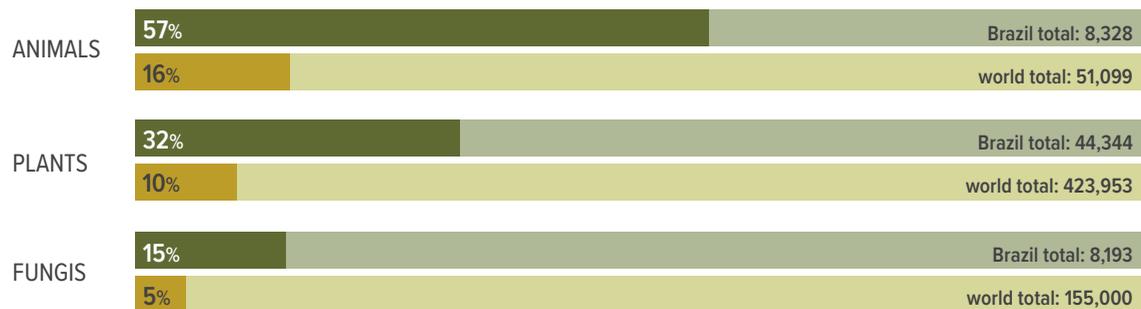
### A Megadiverse Brazil

**15%** of all global biological diversity is found in Brazil.

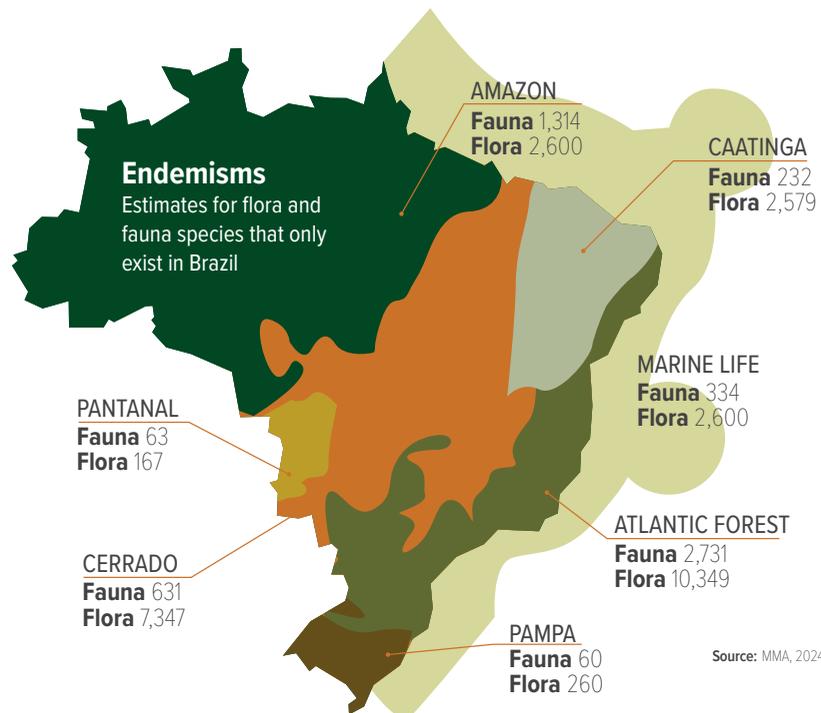
- 125.138 animals
- 44.362 plants
- 8.193 fungi

Source: Convention on Biological Diversity

### Known diversity in the Amazon, in Brazil and the world



Source: NISKANEN et al., 2023; SEGALLA et al., 2021; COSTA et al., 2021; PACHECO et al., 2021; QUINTELA et al., 2020; DAGOSTA et al., 2019; AZEVEDO-RAMOS et al., 2002



Source: MMA, 2024

## Unknown Diversity

One of the most accurate and widely accepted estimates by the scientific community indicates that the Earth is home to 8.7 million species, of which only 1.2 million have been described.

Source: MORA et al., (2011)

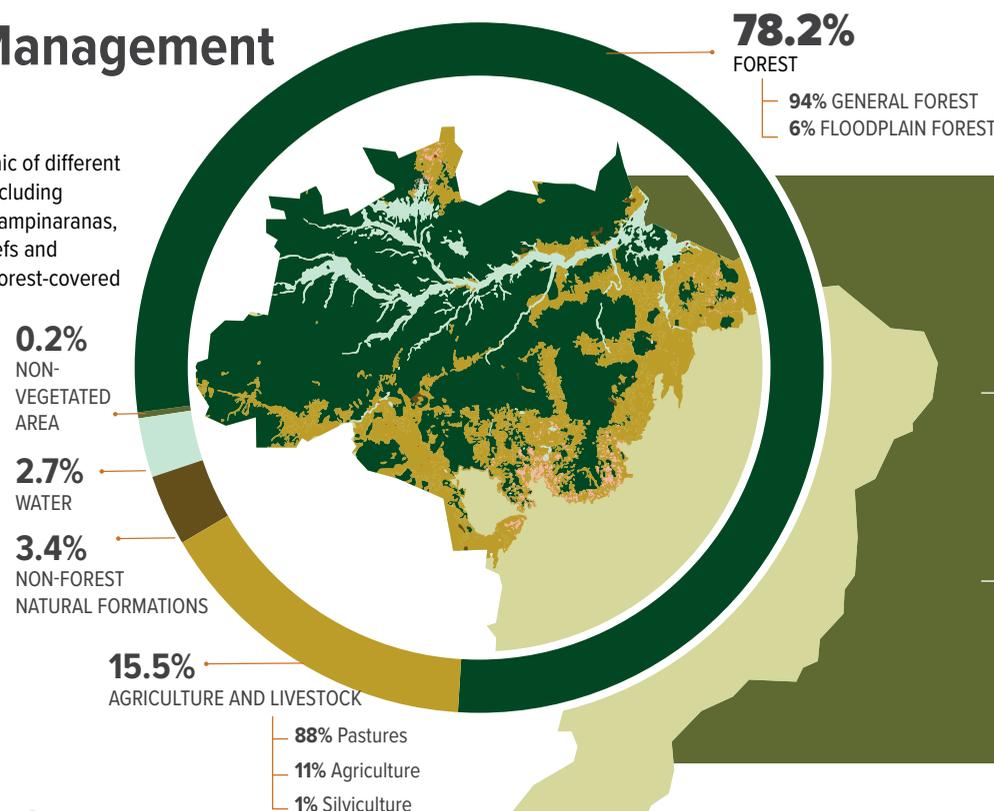
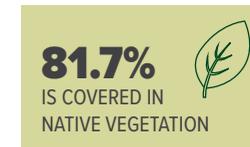


Source: NISKANEN et al., (2023)

## Land Use and Management in the Amazon

The Brazilian Amazon is a complex mosaic of different landscapes and phytophysiognomies, including dryland forests, rupestrian grasslands, campinaranas, igapós, floodplains, mountains, coral reefs and mangroves. Over the past 37 years, the forest-covered area has decreased significantly.

Source: MAPBIOMAS, 2023



**2/3** OF BRAZIL'S NATURAL FORESTS ARE IN THE AMAZON

**50,3 Mha** IS THE NET LOSS OF FOREST COVER BETWEEN 1985 AND 2022

**4,196,943 MILLION KM<sup>2</sup>** IS THE TOTAL SURFACE AREA OF THE AMAZON FOREST

### Comparison of land use in the Amazon

(Units in Mha)



# Pollination and Agriculture

Pollination is an ecosystem service that directly affects agricultural productivity in the Amazon. Reliance on pollinators varies among crops but has a significant impact on production revenues from açai, buriti, cocoa, Brazil nuts and babassu.

Source: SABINO et al., (2022)

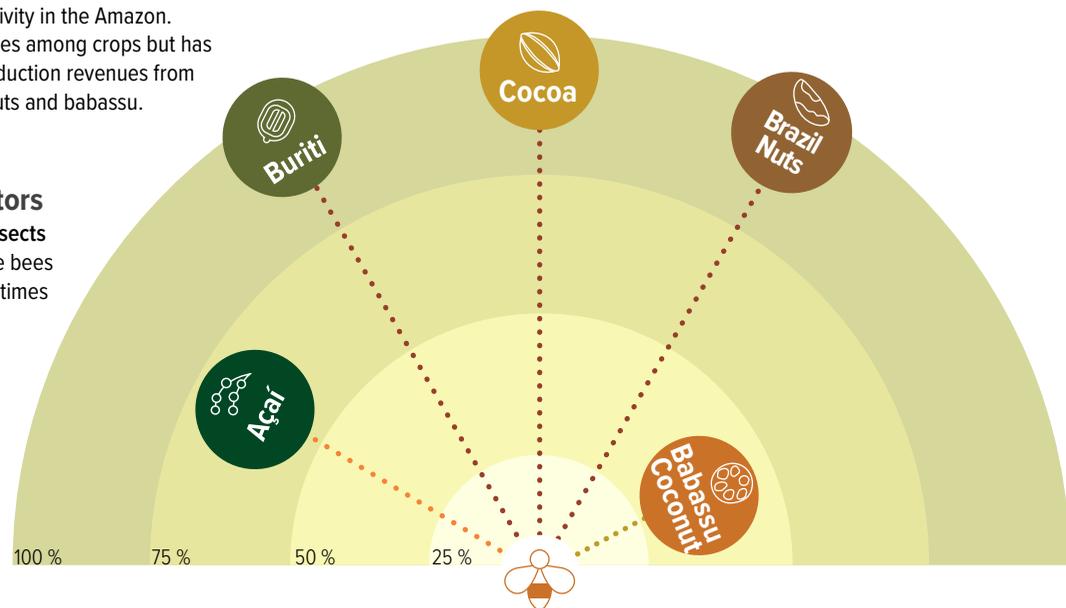
## Diversity of Pollinators

More than 70 species of insects carry açai pollen, but native bees perform this function eight times more often

Source: BEZERRA et al., 2020

## Reliance on Pollinators

- Essential
- High
- Moderate



## Value of Pollination Services

The value of animal pollination for Brazilian agriculture is estimated at R\$ 43 billion per year.

Source: VALOR ECONÔMICO, 2021

## Sustaining Agriculture in the Amazon

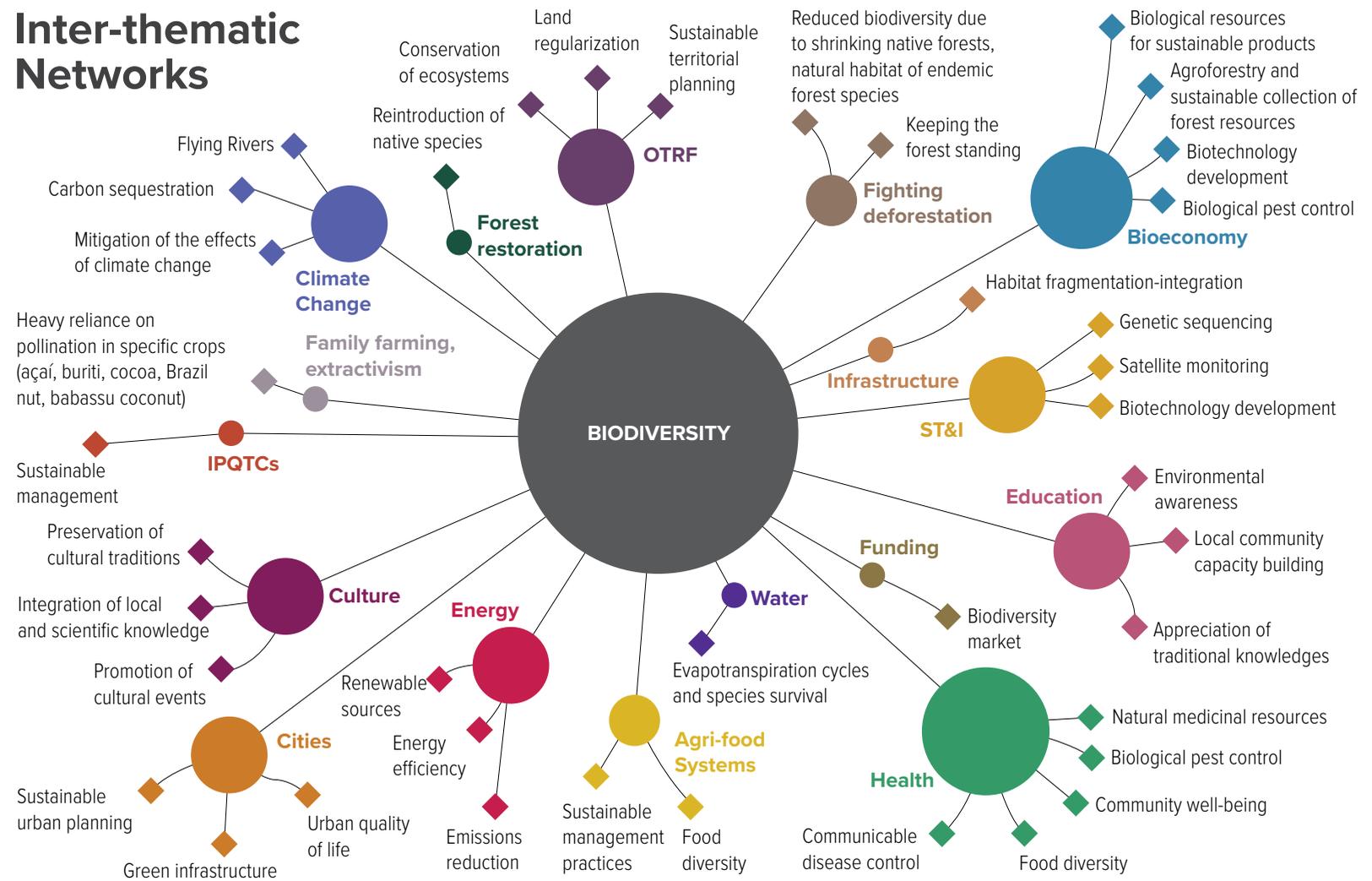
Value of Pollination Services (in US dollars)

- US\$128.4 Million
- US\$704.2 Thousand
- US\$350.3 Thousand
- US\$19.7 Million
- US\$2.6 Million

### LEGAL AND HISTORICAL LANDMARKS

Year	Landmark
1981	<b>Law No. 6.938:</b> provides for the Política Nacional do Meio Ambiente (National Environmental Policy - PNMA), its purposes, formulation and application mechanisms.
1988	<b>Article 225 of the Brazilian Constitution:</b> establishes the right of all to an ecologically balanced environment and the duty to defend and preserve it.
2000	<b>Law No. 9.985:</b> introduces the Sistema Nacional de Unidades de Conservação da Natureza (National System of Nature Conservation Units - SNUC).
2002	<b>Federal Decree No. 4.339:</b> defines principles and guidelines for the implementation of the Política Nacional de Biodiversidade (National Biodiversity Policy).
2007	<b>Ordinance No. 9 of the Ministry of the Environment (MMA):</b> defines priority areas for conservation, sustainable use and sharing of benefits from Brazilian biodiversity.
2012	<b>Law No. 12.561:</b> introduces the Código Florestal (Forest Code), which provides for the protection of native vegetation, including Legal Reserves, Permanent Preservation (APPs), and Restricted Use Areas. <b>Law No. 12.727:</b> amends the Código Florestal (Forest Code), reducing APP ranges and percentages of Legal Reserves in the Amazon, in the Cerrado savannah and in the Atlantic Forest; introduces mechanisms for regularizing deforested areas. <b>Federal Decree No. 7.830:</b> provides for the Sistema de Cadastro Ambiental Rural (Rural Environmental Registry System) and Environmental Regularization Programs.
2015	<b>Lei da Biodiversidade (Biodiversity Law) No. 13.123:</b> provides for access to genetic heritage, protection and access to associated traditional knowledge, and the fair and equitable sharing of related benefits.
2016	<b>Federal Decree No. 8.772:</b> regulates the Biodiversity Law (No. 13.123).

# Inter-thematic Networks



02

Cities



---

---

## Igapó 4, 2024

### Adriana Ramalho

A work involving landscape abstraction, and as an abstract work of art, there are no literal elements, the connection is made through the background, through the colors. The use of so many metallic pigments which allude to gold, to wealth, provoke thoughts about the value of the forest. Minerals may be quite valuable today, however, in the future, the forest will be worth much more than these minerals. Minerals may work well as exchange currency, but they are of no use to sustain life; in this case, they only provide for artistic abstraction, in an attempt to bring beauty and aesthetics to challenging issues of the territory through plastic thinking. This work shows the artist's journey from city to city and a strong influence of the impact of returning to her hometown, Manaus, its various exuberances, the exuberance of a mistreated forest. A combination of elements, such as insect wings, which aesthetically draw attention because of their details, daintiness and frailty, but at the same time they represent the resilience of these animals wearing armors and having superhuman strength, keeping things in proportion.

---

---

To this day, in our social imaginary, the forest, with its exuberance and environmental relevance, represents the ultimate symbol of the landscape of the Legal Amazon. Cities, on the other hand, are often relegated to the background, or even seen as irreconcilable elements vis-a-vis the forest, if not the entire Amazon biome.

This simplistic view, however, ignores the complex reality of the Legal Amazon, in which the urban phenomenon is unveiled through multiple facets, including the coexistence between cities and the forest, with their interdependent dynamics. *“But this is a major challenge. No one wants to study cities in the Amazon because the indigenous population is more interesting, because quilombolas are more interesting, because the discussion on rural land conflicts is more interesting; conservation units are more interesting from a national perspective. Cities are pushed into the background, because when you look at the Amazon you see vegetation, you don't see people or cities”* (Belém/PA).

The landscape of the Amazon as an immense and exuberant forest that is sparsely populated and urbanized contrasts with the widely documented, recent “urban explosion” within the region. *“[...] this identity of being acknowledged as an Amazonian or of recognizing oneself within the Amazon is sometimes difficult, and it comes with time, [...] when we talk about the Amazon [...] in a school context [...] we refer [...] to the standing forest. [...] in the woods, in the forest, where the wild animals are, and we forget that the Amazon is also composed of populations, of traditional*

*peoples, and of people who are not necessarily traditional peoples, but who live in the big cities”* (Belém/PA).

The historical invisibility of Amazonian urban reality, often relegated to an appendage to the vast forest, has contributed to hiding the role of cities in the preservation of Amazonian biomes. Nevertheless, the debate on bioeconomy, urban sustainability and nature-based solutions has been gaining momentum, recognizing the relevance of urban spaces in the Amazon.

The “forest cities”, for example, offer experiences of coexistence between Amazonian biodiversity and urban practices, demonstrating a potential harmony between man and nature. Large cities, in turn, offer opportunities to rethink and implement measures based on the principles of sustainability and social equality.

Different perspectives have gradually (re)acknowledged the spread of urban fabric in the Amazon. This spread is not limited to the definition of urban perimeters or physical boundaries of cities, but also involves the existence of urban life beyond the limits of formal towns. Urban life is strongly linked to cities through day-to-day spatial relations of exchange, whether symbolic or material.

#### Dismantling Stereotypes

In the academic literature dedicated to the study of Amazonian cities, one of the most persistent efforts among researchers is that of dismantling stereotypes that pervade the views on urban environment in the region. Since the middle of the 20th century,

a plethora of academic works has committed to breaking with the mythical visions surrounding the Amazon territory, whether that of the Hylaea portrayed by Brazilian writer and journalist Euclides da Cunha (1866-1909) as paradise lost, or that of the jungle hostile to civilized man in *Inferno Verde* or ‘Green Inferno’ (1908), by writer Alberto Rangel (1871-1945)<sup>1</sup>.

In the 1980s, geographer Bertha K. Becker proposed recognizing the Amazon as an “urbanized forest”, highlighting the intensification and expansion of migratory flows towards Amazonian cities. This is not about the presence of cities in the region’s landscape as a dominant feature, but rather the expansion of the urban way of life.

Becker (2001) places the emergence of this “urban explosion” in the Amazon between 1966 and 1985, based on major interventions by the federal government that, through the implementation of the so-called “planned network”, promoted major spatial transformations in the region. Infrastructure developments such as the Trans-Amazonian Highway, the Carajás Railway, the Tucuruí Hydroelectric Power Plant and the Port of Ponta da Madeira were the most significant elements in this network, as they have significantly shaped the dynamics of Amazonian cities to this day.

There are other relevant theses on Amazonian urbanity, such as that of geographer Lia Osório Machado (1999), who identifies an accelerated urbanization in the Amazon and proposes a complementary view to that of Bertha Becker. The Brazilian re-

“Several things move me [in Amazonian cities], but the relationship with the environment is quite significant [...]. For me, it is an honor to be able to teach in Juruti, for example, and to attend the [Indigenous].”

searcher points out that, even in rural areas, the population is not dissociated from that urban-based system, from a political (institutional articulation), economic (integration into the market and technical support services) or cultural (expectations shaped by the urban way of life) point of view. In fact, there is a tendency towards ruralization of homes and not of behaviors, practices and relationships. Urbanization in the Amazon is not defined only by the presence of cities in the landscape, manifested through the urbanization of the territory, but mostly through the propagation of urban society in the region (OLIVEIRA, 2000).

### A Complex Social Web

The Legal Amazon comprises a diverse typology of cities and towns that, through the flow of people, goods and ideas, connect with each other in a vast territory of 5,015,146.008 km<sup>2</sup>, encompassing 772 municipalities in nine states (IBGE, 2024).

*“[...] at present our most important relationship is among the communities of the Tapajós-Arapiuns River, in connection with Santarém. Santarém is the city where political demands take place: health, education, claims for better living conditions, infrastructure, transportation, and political organization itself. The headquarters of the Tapajós Arapiuns Indigenous Council (CITA) and of the quilombola organizations are all in Santarém, so we are part of this movement”* (Santarém/PA).

These Amazonian cities portray the rich cultural, social and economic diversity of the territory, also reflecting customs and traditions, challenges and opportunities. *“Several things move me [in Amazonian cities], but the relationship with the environment is quite significant [...]. For me, it is an honor to be able to teach in Juruti, for example, and to attend the [Indigenous] Tribes Festival [...], it amazes me how a city with a few thousand inhabitants can organize [...] something equivalent to a Mardi Gras carnival, or even to a Nice carnival in France, in terms of materials and instruments”* (Belém/PA).

The spatial distribution of households in the Amazon also questions the image of the region as a vast demographic void.

More dispersed than in other regions of the country, such as the Southeast, South and Northeast, the spatial distribution of households in the Amazon is more widespread than that of urban areas, revealing an organized dispersion around urban centers, in large polygon-shaped distributions or along lines, forming a mosaic beyond cities. *(...) when we look at [...] the network of cities from REGIC<sup>2</sup>, we see a lot of empty spaces. (...) [In fact], those cities have always been articulated with a hinterland [backcountry]. This hinterland has networks of villages, hundreds of villages, and those were always what supplied these cities [...] And there we had an articulation which, as I always say, was capable of coexisting with the Forest”* (Belém/PA).

Research studies such as that of architect and urban planner Ana Cláudia Duarte Cardoso corroborate this reality, highlighting that, far from being isolated, the populations that live in these areas maintain dynamic and intertwined relationships with nearby cities, crafting a complex social and economic web, woven by different forms of occupation and activities (CARDOSO, 2021)<sup>3</sup>.

Amazonian cities are described as places of co-presence, where realities from other locations – urbanized or not, close or very distant, in horizontal or strongly hierarchical relationships – are interlaced, and where the internal diversity of their inhabitants is expressed. *The city [of Santarém] is full of tensions [...] On the one hand, we feel the need to develop a more popular culture, a street culture. On the other hand, you have big money spon-*

soring agribusiness and country music. On one side, there is this model that is prejudiced and income-concentrating. On the other side, there is us trying to maintain our riverine, indigenous and quilombola traditions, the tradition of eating fish, for example. And there is yet another side, where the culture of cattle ranching, of agribusiness prevails” (Santarém/PA).

“We need to understand that Santarém is at the center of this dispute, because, historically, the projects devised for cities are environmentally pernicious, economically income-concentrating, exclusionary, and culturally prejudiced, but, concomitantly, there are peoples who resist based on their culture, on their dynamics” (Santarém/PA).

They are, therefore, constituted as complex and multifaceted urban spaces whose problems do not arise in isolation, but rather as interconnected and multifactorial phenomena. “We are also constantly challenged here by these demands for city Master Plans, demands for urban regulation. So, we have to find a way to work towards solutions, to create instruments, develop strategies for some things, some realities that have no dialogue with what is currently in place. There is no point in taking material from São Paulo to draw a master plan for Limoeiro do Ajuru, [...] which is where the Tocantins and Amazonas rivers meet” (Belém/PA).

In the Legal Amazon, local and regional particularities pro-

duce examples of how city configurations occur through “particular realizations of processes that can engender all types and forms of spatial organization”, as observed by Machado (1993, p. 4)<sup>4</sup>. “[...] we work within Quilombo da Liberdade, which is the largest urban quilombo in Latin America, and we work directly with this black identity, with our youth, with what it means to be a quilombola, with ethnic and racial issues, with racial literacy, with the occupation of spaces, with women’s decision-making power” (São Luís/MA).

Amazonian cities, therefore, reflect the rich cultural, social and economic diversity of the territories, shaping and reflecting their customs and traditions, challenges and opportunities. From metropolises to small riverside villages, each Amazonian city displays its own identity, shaped by distinct historical, social, economic and environmental factors.

“Belém is a city with a rich history. It dates back to 1616 and has interesting logistics because it was originally a river city, but at the same time it is an urban metropolis, with all the advantages and disadvantages of becoming one. It belongs to this area with a highly significant cultural identity, especially in places not far from the capital city. If you take a five-minute river crossing, for example, you are in an area of traditional Combu occupation, on the most famous island. But there are many other islands; Belém includes thirty-seven islands. So, I think that what

sets Belém apart as a capital city in the North Region is mostly its sociocultural identity” (Belém/PA).

The urban diversity of the Amazon is not limited to its characterization as solely a problem - a foreign body that puts nature and the surrounding peoples at risk-, nor is it simply a solution - some kind of redeeming reality, a human refuge and the only center for disseminating solutions. It is a place of convergence and transformation, where challenges and opportunities intertwine, and hence it calls for a watchful eye at its singularities and interactions with the surroundings.

### Amazonian Urbanities

The constitution of urban diversity in the Legal Amazon can be understood based on typologies that portray different historical periods in which the region’s urbanization occurred. According to geographer Saint-Clair Cordeiro da Trindade Júnior (2015), the first period that characterizes Amazonian cities includes the years prior to the 1960s.

During that time, urbanization was marked by traditional economic activities, predominantly extractivism and interurban flows via rivers and, later, railways. In the forest there were practically no intermediate cities; at most, there was one main city, such as Manaus or Belém, surrounded by small towns (DA SILVA, 2019).



*Auricularia fuscusuccinea*

Just like *A. delicata*, *A. fuscusuccinea* is also called “agouti ear” or “bat ear” by the indigenous peoples of the São Gabriel da Cachoeira region (Amazonas State). This species was scientifically described by French mycologist Camille Montagne in 1842. Its type locality is Cuba. The consumption of *A. fuscusuccinea* by the Ikpeng (Txicão) and Mebêngôkre (Kayapó) peoples, Mekrãgnoti (Txucarramãe) subgroup, of the Xingu National Park, Mato Grosso State, was reported by Oswaldo Fidalgo and José Massaru Hirata in 1979. In 2002, Aida Vasco-Palacios reported the consumption of *A. fuscusuccinea* by the Murui-Muinani (Uitoto) people in the Aracuaera Region, Colombia.

Urban spaces in the region were characterized by the so-called “cities of prominent citizens,” a concept developed by geographer Milton Santos [1926-2001] to refer to small towns inhabited by prominent social figures, such the priest, the notary, the primary school teacher, the judge, the prosecutor, and the telegraph operator” (SANTOS, 1993).

From the 1960s onwards, the period of economic fronts and of intensification of modernization processes in the Amazon region began. Although they did not disappear, the “cities of prominent citizens” began to give way to “cities of the economy”, “where agronomists (who previously lived in the capital cities), veterinarians, bankers, agricultural pilots, fertilizer specialists, and those responsible for specialized businesses are essential” (SANTOS, 1993). These cities are multimodal hubs, with emphasis on highways and airways, even though the rivers have kept their importance. Urban-regional centrality explodes beyond metropolitan areas, as medium-sized towns now constitute dynamic economic centers, with strong influence over certain sub-regions, and with connections on a global scale (DA SILVA, 2019).

#### **Integration with the Region, the Country and the World**

Currently, in the universe of cities in the Legal Amazon, small and medium-sized centers are prevalent (CHEIN; PROCÓPIO, 2022), but emerging metropolitan realities contradict the conven-

tional view that people hold about the region: that it is a place isolated from the massive national and global flows of people, goods and information, where the urban environment is an exception. In addition to Belém and Manaus, which have surpassed the one million mark in the 1990s, São Luís joined the group of cities with a population of over 1 million people in 2010.

In the context of connections with markets outside the region, the role of waterways in the Legal Amazon is a key element for regional, national and international integration. Amazonian rivers act as pathways that carry a large portion of the movement of people and cargo, connecting riverside cities to their respective hinterlands with human occupation, especially in areas where road infrastructure is precarious or absent.

Hence the importance of the region’s rainfall regime – prolonged droughts, as observed due to a greater occurrence of extreme weather events, isolate populations and prevent their access to the most basic services offered in cities. *“Let’s say that 98% of the quilombola communities, at least in the North region, [...] live in rural areas, and then I realized [...] this dichotomy and this distance regarding access to the city, because when we talk about access to the city, we are talking about access to public policies, sanitation, education, public transportation, culture, leisure, which communities that do not live in these centers [...] are unable to experience in full”* (Belém/PA).

Integration among towns in different municipalities is a reality identified by IBGE in all states of the Legal Amazon, but it takes on a different geopolitical quality when it comes to the Border Strip<sup>5</sup>. By constitutional provision, the area comprised within this strip “is considered fundamental for the defense of the national territory, and its occupation and use shall be regulated by law” (Art. 20, § 2). This imposes a formal need for the federated entities (Union, States and Municipalities) to articulate their respective public policies with the geopolitics of defense of national sovereignty.

Despite holding only 21.24% of the municipalities within the Border Strip (125 of the 588 municipal territories), the Legal Amazon accounts for 75% of the total area of this strategic zone, which amounts to 1,421,344.688 km<sup>2</sup>, and which, according to IBGE (2022), corresponds to 16.7% of the Brazilian surface area.

This discrepancy between municipal participation and territorial extension is an indication of the unique geopolitical relevance of the Amazon in the Border Strip, but it says little about the role of Amazonian cities in the aggregate of cross-border spatial interactions in Brazil.

The fact that 83 Amazonian municipalities have their district capitals located within the Border Strip provides institutional evidence regarding the importance of urban issues in the discussion on geopolitics and national sovereignty in this territory. In ten of those municipal capitals, the phenomenon of conurbation - cities

located in more than one country - occurs. Here is a list of these so-called “twin cities”: Assis Brasil (AC), Bonfim (RR), Brasília (AC), Cáceres (MT), Eptaciolândia (AC), Guajará-Mirim (RO), Oiapoque (AP), Pacaraima (RR), Santa Rosa do Purus (AC), and Tabatinga (AM).

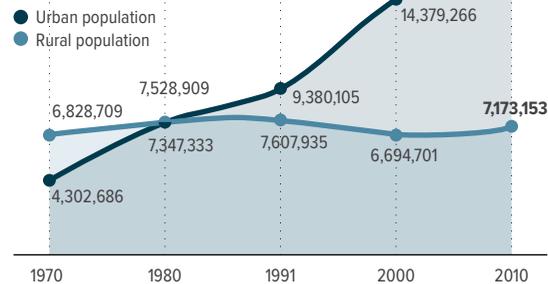
These are cities that play a fundamental role in regional integration and local development, both in the Legal Amazon and throughout Brazil. They function as “articulating hubs for local, regional, national and transnational networks and sub-networks”, “places where the symmetries and asymmetries between national territorial systems become more visible and which can become one of the pillars for cooperation with neighboring South American countries and for the consolidation of citizenship” (MACHADO et al, 2005).

# Cities

The Legal Amazon comprises a variety of city types that are connected through the flow of people, goods and ideas. Amazonian cities are often considered secondary or even irreconcilable with the preservation of biodiversity. This is a limited view that ignores the urban contexts of the region, where cities and forest emerge and coexist in different configurations and interdependently.

## Rural and Urban Populations

In the mid-1980s, the urban population surpassed the rural population, and this gap has been widening ever since.



Source: IBGE CENSUS 1970-2010. Prepared by the Amazon Concentration

## Urban Concentration Axes

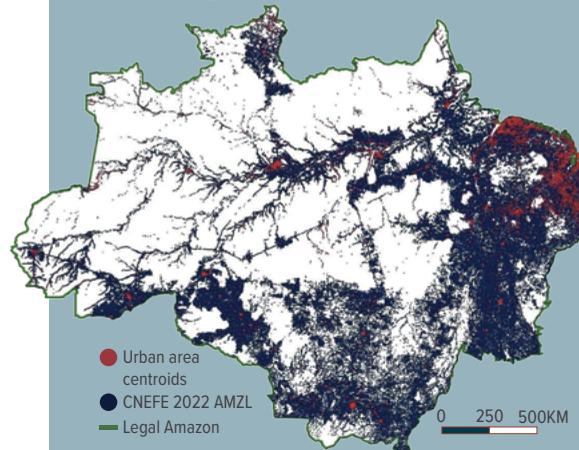
Urban concentration axes can be observed along the Amazon River bed, on the northeastern coast, and along the BR 230 - Trans-Amazonian, BR 163 (MT-PA) and BR 364 highways.



## A Mosaic of Cities

Although more dispersed when compared with other regions of the country, the spatial distribution of households in the Amazon is more comprehensive, revealing a dispersion around urban centers and forming a mosaic that extends beyond its cities.

## Households and Urbanized Areas in the Legal Amazon



Source: Prepared by the Author.

## A Forest Metropolis

Manaus is the largest city in the Legal Amazon, both in terms of population and surface area.

<b>277</b> KM <sup>2</sup>	<b>2,063,689</b> INHABITANTS
<b>6<sup>TH</sup> LARGEST</b> URBAN AREA IN BRAZIL	<b>7<sup>TH</sup> LARGEST</b> POP. IN BRAZIL
<b>R\$ 37 BILLION</b> 5 <sup>TH</sup> IN INDUSTRIAL GDP	<b>R\$ 103 BILLION</b> 5 <sup>TH</sup> LARGEST NACIONAL GDP

HIGHEST GDP AMONG ALL MUNICIPALITIES IN THE NORTH AND NORTHEAST REGIONS.

Source: IBGE Cidades, 2024 e IBGE, 2021.

## Legal Amazon Territory:

The Amazon includes small riverine villages, medium and small towns, regional centers and regional metropolises

Source: IBGE, 2024

<b>5,015,146</b> KM <sup>2</sup>	<b>9</b> STATES	<b>15</b> METROPOLITAN AREAS	<b>772</b> MUNICIPALITIES	<b>49%</b> OF THE COUNTRY'S TOTAL SURFACE AREA
----------------------------------	-----------------	------------------------------	---------------------------	--

# Urban Diversity

The notion of urban diversity refers to a variety of urban formats and dynamics present in the Legal Amazon (AMZL), where urban centers coexist with peri-urban and rural areas, forming a complex mosaic of occupation and interaction. It is possible to grasp the complexity of an urban Amazon starting from two assumptions: that 'urban' is a way of life and that a categorization is needed to address specificities.

## Proposed Categorization of Amazonian Cities:

Source: Adapted from Trindade Júnior (2013,2015).

### SMALL TOWNS

Located mostly in central-eastern Amazon. They are exceptionally diverse.

### TRADITIONAL TOWNS

Cities that pioneered the organization of the territory and are associated with traditional activities and populations. Their population is of local origin or descends from the first wave of migrations, and there are groups of "prominent citizens".

### HIGHWAY TOWNS

Located along highways and arising from official colonization projects, private colonization or spontaneous flows of people.

### COMPANY TOWNS

Their inception is linked to the establishment of logistics centers for enterprises; they bring the region into global production hubs.

### MEDIUM-SIZED TOWNS

These centers have stood out from the second half of the 20th century and have economic and political importance in regional and global contexts. They have a relatively large population (<1,000,000). Spread throughout the territory, these centers are positioned at urban network nodes where there are concentrated flows of goods, people and products.

**'RURÓPOLIS' AGRICULTURAL TOWNS**  
Cities revolving around highway traffic, where there is a strong influence from agriculture. They receive public and private investments.

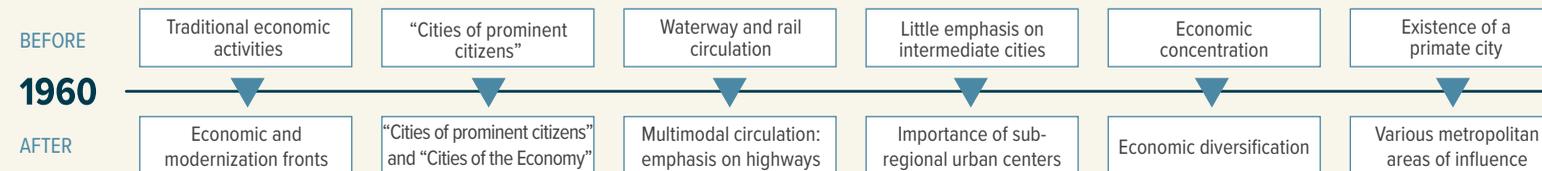
**TOWNS OF RIVERINE TRADITION**  
Centers where waterway transport is the prevailing mode. The roles of agriculture and extractivism are relevant. They constitute new forums for political decision-making.

**STATE CAPITALS**  
Cities playing important administrative and bureaucratic roles, since they are seats of government. Their economies are diversified, with important trade and services sectors. Most investments come from the government.

### NEW REGIONAL METROPOLISES

Cities that polarize a limited area, with a surrounding region that is not very extensive. They have large populations (>1,000,000) and high population and economic growth rates. In the Legal Amazon they are represented by Manaus, Belém and São Luís.

## Urban Network:



Source: Adapted from Trindade Júnior (2015).

# Cities and Borders

Of the region's 558 municipalities, 125 are located within the border strip. The Legal Amazon accounts for 75% of the extension of this strategic border zone, with a total area of 1,421,344.69 km<sup>2</sup> (16.7% of the Brazilian territory).

Source: IBGE (2022)

## Types of interactions between cross-border cities:

**Margin:** little cross-border integration, with a predominance of local interactions among family members or in minor economic exchanges.

**Zona-tampão (Buffer Zones):** little cross-border interaction due to territorial restrictions; presence of national parks, protected areas and indigenous reserves.

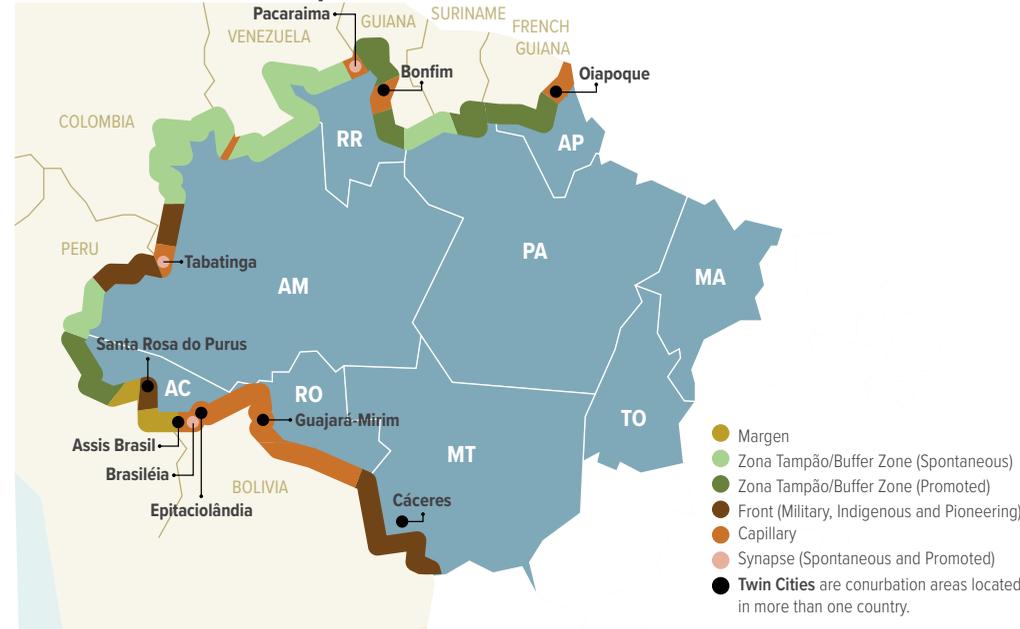
**Front:** areas of urban and economic expansion, with significant migration and investments.

**Capillary:** diffuse, low-intensity cross-border interactions with local primacy.

**Synapse:** intense exchange between border populations, with dynamic circulation of people, goods and services.

Source: MACHADO et al. (2005)

## Northern Arc Border Strip:



Source: MACHADO et al. (2005, p. 149)

## LEGAL AND HISTORICAL LANDMARKS

1970

**Law No. 1.106:** Programa de Integração Nacional (National Integration Program), whose first stage involved the immediate construction of the Trans-Amazon and Cuiabá-Santarém highways.

1988

**Federal Constitution: articles 182 and 183:** address urban development policy and adverse possession; article 20, § 2 stipulates the designation of a border strip, with occupation and utilization to be regulated by law.

2001

**Law No. 10.257:** the Estatuto da Cidade (City Statute) regulates the Urban Policy chapter (arts. 182 and 183) of the 1988 Federal Constitution and mandates the preparation of a Master Plan for municipalities with more than 20 thousand inhabitants.

2003

**Decree No. 4.793:** establishes the Câmara de Políticas de Integração Nacional e Desenvolvimento Regional (Chamber for National Integration and Regional Development Policies) within the Government Council.

2005

**Law No. 11.124:** provides for the Sistema Nacional de Habitação de Interesse Social (National Social Housing System - SNHIS); creates the Fundo Nacional de Habitação de Interesse Social (National Social Housing Fund - FNHIS).

52

2007

**Decree No. 6.025:** introduces the Programa de Aceleração do Crescimento (Growth Acceleration Program - PAC). **Decree No. 6.047:** introduces the Política Nacional de Desenvolvimento Regional (National Regional Development Policy - PNDR) among other provisions.

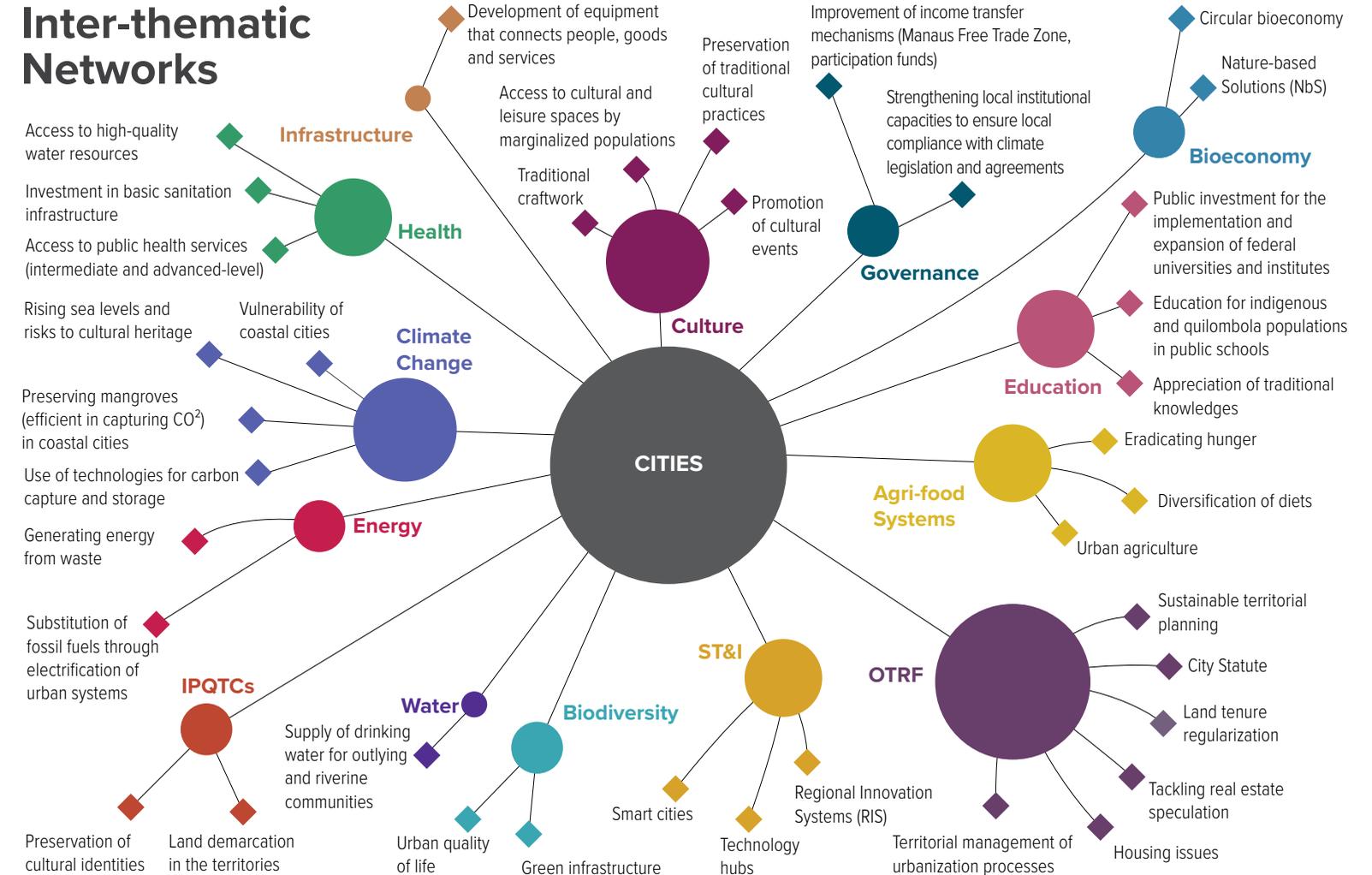
2009

**Law No. 11.977:** establishes the Minha Casa, Minha Vida (My Home, My Life) housing Program and provides for land tenure regularization of settlements located in urban areas.

2024

**Decree No. 11.962:** provides for the Política Nacional de Desenvolvimento Regional (National Regional Development Policy - PNDR) **Law No. 14.935:** introduces the Política Nacional de Agricultura Urbana e Periurbana (National Policy for Urban and Peri-urban Agriculture).

# Inter-thematic Networks



# Culture



---

## **Memórias de um caroço, 2024**

### **Memories of a fruit pit**

Hadna Abreu

The spring of this igarapé stream which is the artwork must spring from within. Hadna sought this out in her family background. My grandfather was a milkman and an açaí crop manager in the 1970s in Manaus, professions that are as extinct as typists in the age of smartphones. What is culture then? Because, for me, culture is something that lives among and within us, it is not external to us, hence the name of this work: Memories of a Fruit Pit. A pit is a seed, a pit is a house, and as a house it holds memories, when planted they tell stories.

---

As a result of the increased frequency of extreme weather events and their impacts on human life and on the availability of natural resources, over the last decades many initiatives, policies and scientific research have been carried out in the Amazon region, with the aim of identifying and analyzing the complex system of fauna and flora species, microclimates, as well as geochemistry and biochemistry, ecosystem services and bioeconomies.

In the wake of such initiatives, economy-driven activities and enterprises became references in developing ways of tackling systemic crises and of protecting and valuing the material and immaterial aspects of Amazonian societies, whereas the potentialities and sociocultural wealth of the Amazônias and the voices of diverse native peoples and social groups that have always made - and still make - the territory their home were downplayed (KAMBEBE, 2022; BANIWA et al. 2024.) In consequence, until now, culture as a driver for development in the Amazônias has been squandered.

Culture is here understood as both the symbolic capacity – customs, ideas, beliefs and representations – and the material structures – institutions, forms of material replication, behavior patterns and regimes of coexistence – creatively passed on and reinvented across generations by social groups, to maintain their being and their existing in the world. Cultures are imbued with historicity that, once acknowledged and investigated, makes it possible to unveil oppositions and conflicts among groups and within each social group.

All human relationships are mediated by cultural elements. Even political decision-making is based on cultural perspectives (GEERTZ, 1981; LARAIA, 1986; CHAUI, 2012). *“Culture disturbs, culture stirs, culture disobeys and flourishes. And that is why it is also an expression of a democracy of rights. Art draws oxygen from it, because it stirs deep layers of our lives and our being. Culture and art are tools for constant transformation, regardless of the actions that try to stop them. The harder one tries to suppress them, the more defiant and revolutionary they will rise.”* (Margareth Menezes, 2023).

#### **Lack of Appreciation**

Despite the importance of culture in driving other narratives for the development of the Amazônias, over the last three decades the political agenda for the sector has barely grown at the federal, state or municipal level. *So, culture-oriented policies are not regarded as factors that foster development. Culture has not been addressed as a factor for development, and it certainly is a factor for development, both from a social and from an economic point of view for people. Socially, you strengthen identities, strengthen cultural territories, strengthen cultural practices that are important for the identity of a people, and automatically you have an industry, an economy operating based on what people experience through these productions”* (Belém/PA).



“Here in the Amazon we are all quite hybrid, right? It is a predominant feature, this very perspective of mingling and blending among the original peoples and those who arrived here, especially from the Northeast.”

#### *Cantharellus guyanensis*

The species *Cantharellus guyanensis* was collected in Guyana by pharmacist and naturalist François Mathias René Leprieur and described in 1854 by mycologist Camille Montagne, both French. In the Central Amazon region, it is common to find this species in areas of Campina and Campinarana vegetation near Macucus trees (*Aldina heterophylla* Spruce ex. Penth). *Cantharellus guyanensis* belongs to the genus of the well-known edible species *Cantharellus cibarius* Fr. Abundant in the Cuieiras River Basin region and in the Rio Negro Sustainable Development Reserve (RDS), Manaus (AM), *C. guyanensis* is a major attraction for Gastronomic Mycotourism in the region. Molecular analyses of the ITS region of ribosomal DNA from samples collected in the Rio Negro RDS showed 99.5% similarity with the sample of *C. guyanensis* collected in Guyana.

Limited understanding of culture as a driver of local development can be observed both by the small volume of government transfers and investments in the culture sector in general, and by the meager fund allocation for the sector in the Legal Amazon, in particular (IBGE, 2022). Funds go through successive funnels until they reach the holders of cultural assets, the final beneficiaries in this process, with uninspiring results.

*“In every context, the Amazon has always been portrayed in this way, as being much less than it deserves. We could start right there, by the way... the money that gets here is not equal to the amounts granted elsewhere in the country. So, for this cap, for this money to come from up there, it started from a ceiling amount that kept decreasing and decreasing, and when it reaches the receiving end, it comes down to almost nothing. And then, if the Amazon region is already getting less, now imagine when it is split among the states that comprise it. Then you have the capital city and the other, more developed municipalities, and then the less developed ones, and you are already getting the scraps of the scraps. And when those scraps come to where the riverine communities are, where the peoples of the forests and waters live, just imagine how much of it turns up there. It arrives late and, when it does, it’s the crumbs of the scraps”* (Macapá/AP).

#### Wealth in Diversity

This scarcity of resources does not match the sociocultural

wealth of the Legal Amazon, which holds overwhelming plurality associated with the history of its almost thirty million inhabitants. This figure includes urban dwellers, indigenous peoples, quilombola communities, riverine communities<sup>2</sup>, fishermen, rubber tappers, riverbank dwellers<sup>3</sup>, piassava palm harvesters<sup>4</sup>, land reform settlers, açai berry pickers<sup>5</sup>, floodplain dwellers, traditional healers, prayer leaders, and chant leaders, among others.

Many came in different periods and as part of internal migration flows from the Northeast, Southeast and South regions of Brazil. Many others also arrived from Asia (Japan), the Middle East (Lebanon, Syria, Turkey, Israel), Europe (Spain, Portugal, Italy, France, England, Germany and Austria), Africa (Guinea Bissau, Ivory Coast, Guinea, Mali, Mauritania, Nigeria, Senegal, Benin, Cape Verde, Congo, São Tomé and Príncipe, Equatorial Guinea, Angola, Mozambique, Namibia, South Africa, Zimbabwe) and, more recently, due to the economic and political crisis, from Venezuela (COSTA, 2020; JAKOB, 2015; EMMI, 2009).

*“Here in the Amazon we are all quite hybrid, right? It is a predominant feature, this very perspective of mingling and blending among the original peoples and those who arrived here, especially from the Northeast”* (Boa Vista/RR).

In addition to people of different origins, backgrounds and territorialities, the Amazônias encompass a wide range of religions (Catholicism, Evangelicalism, Judaism, Umbanda, Candomblé, Buddhism and Islamism), languages (mostly indigenous), tradi-

tions, legends, myths and cosmologies<sup>6</sup>.

*“Sometimes there is this romanticism here of saying that the Amazon is indigenous. What I feel is that there are missing elements to make this connection. We simply say that it is indigenous, but we fail to understand to what extent it is Munduruku, or Tupinambá, or Arara. So this romanticism is sometimes shallow because of this, because it does not bring out this deeper dimension that should be within our reach here in the Amazon. The same applies to racial inequality issues. The Amazon is as black as it is indigenous. When I had the opportunity of going to the Oriximiná quilombos (...), I experienced a type of Africa there”* (Belém/PA).

The idea of an Amazonian culture, therefore, has been narrated as a hybrid synthesis and a linguistic and “way of life” confluence, where tongues, dialects and idioms meet other forms of language and communication, especially among indigenous peoples, Europeans and Africans; the narrative also speaks of clashes among territorial players, transnational corporations and government institutions (OLIVEIRA AND REIS, 2021; SANTOS, 2018; KAMBEBA, 2013). The formation of Amazonian cultures and the various Amazonian subjects are inserted in landscapes and territorialities bristling with sociocultural contrasts and contradictions and power relations (FRAXE; WITKOSKI; MIGUEZ, 2009).

For the Amazonians, culture is not a lens through which one

sees the world, but an inextricable tangle of practices, knowledges and values. Dances, celebrations, music, shamanism, spiritual blessings, chanting and food are expressions and instruments of relational meaning among the material, the immaterial, the symbolic, the identity (belonging), the ancestral, the cosmological and the artistic aspects of culture.

*“I insist on saying that we are also not only beings of light, but beings of stone and water. These things are fundamental here in our State [Amapá], because of the fortress of Macapá city, made of stone, because of the Amazon River in all its might, with a huge volume of water and rainfall, here in Amapá as well as in Belém city. And the issue of solstices and equinoxes”* (Macapá/AP).

Macapá is the only Brazilian capital that is intersected by the Equator. There, it is possible to observe the direct incidence of sunlight where the northern and southern hemispheres meet, during the equinoxes of March and September, when both receive the same amount of sunlight. *“At noon, if you are standing, on the third day of the equinox, you do not see your shadow, so you are a shadowless haunt”* (Macapá/AP).

### **Culture and Forest**

The presence of the forest and its diverse incorporation, sometimes as an object, sometimes as a subject, as an opponent or as

a partner, imposes a first layer of meanings and cultural practices that guide socioeconomic activities and their representations. The centrality of the forest, of traditional communities and of indigenous peoples commonly associated with it constitute one of the most usual forms of representing the Amazon territory (BARROSO E ARAÚJO, 2010; PAES LOUREIRO, 2019).

The recognition of this dimension has rendered cities and urban issues less visible, with everything they entail in cultural terms: peripheral cultures, new ways of expressing and experiencing territorialities, formation of new identities and new conflicts, and webs of meanings.

In recent decades, urban centers and networks of cities have been created from different spaces and times, a complexity that shows different urban realities which in turn require specific approaches to cultural management (PAES LOUREIRO, 2014). *“I guess culture involves processes that can be quite interesting. Now, in order to advance, you need to have... maneuverability, political mobilization on the part of cultural segments, cultural movements, to advance a proposal for cultural citizenship, get it? (...) I think we have to invest in that direction, you know? Invest in culture policies... Well, not in culture policy per se, but in the policies for cultural movements, this is how we can make culture policies advance, make the culture-related agenda advance. We must tackle these issues head on”* (Belém/PA).



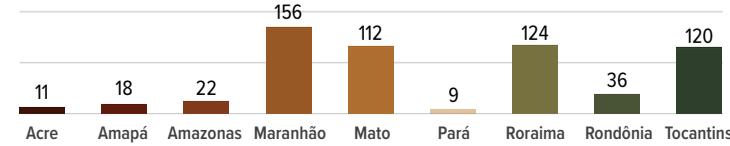
# Culture

Culture is an indissoluble network of practices, knowledge and values. It provides individuals or groups with meaning in their experiences and sociopolitical practices, in which thoughts and feelings are not separated from the design and development of actions.

## Libraries

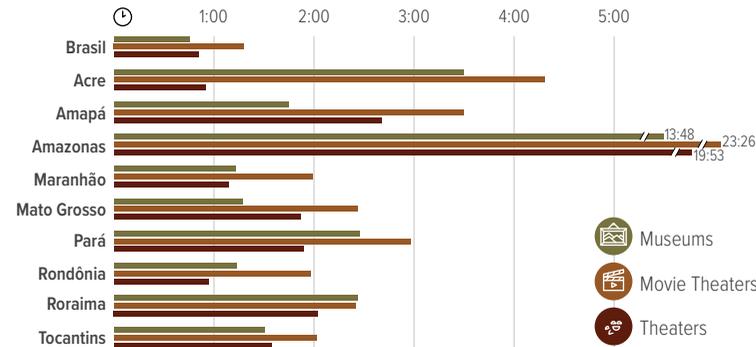
Despite comprising 33.3% of Brazilian states, the Legal Amazon hosts only 10% of the country's public libraries.

**608**   
IS THE NUMBER OF LIBRARIES IN THE LEGAL AMAZON.



Source: SISTEMA NACIONAL DE BIBLIOTECAS PÚBLICAS (SNBP), 2023

## Average Travel Time to Cultural Facilities



Source: IBGE, PESQUISA DE INFORMAÇÕES BÁSICAS MUNICIPAIS 2021; IBGE, BASE DE REFERÊNCIA DE DISTÂNCIAS RODOVIÁRIAS, HIDROVIÁRIAS E AÉREAS, 2021.

## Cultural Equipment and Infrastructure

Public cultural policies aim to promote artistic activities and democratize access to cultural goods and services for the population as a whole. In addition, they seek to value and preserve the national cultural heritage, both tangible and intangible, such as knowledge, ways of living, being and expressing oneself.

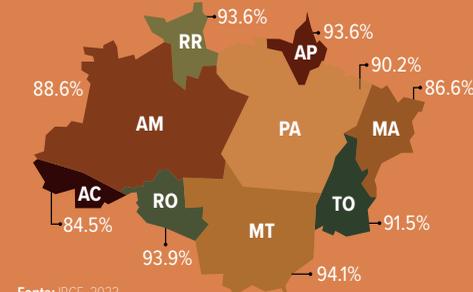
## Cultura Viva (Living Culture)

The Cultura Viva (Living Culture) Program, created in 2004 and passed into a national policy law ten years later (Law No. 13.018/2014), establishes the installation of cultural points and hubs throughout the country, especially in the most underserved territories. These are spaces dedicated to audiovisual production, digital culture, cultural heritage, creative economy, dance, crafts, street art, drama, literature, popular culture, among others. Currently, of the 6,437 Cultura Viva agents in the country, cities in the Amazon house 808 of these initiatives (12.5%).

Source: CULTURA VIVA PROGRAM, 2024

## Connectivity

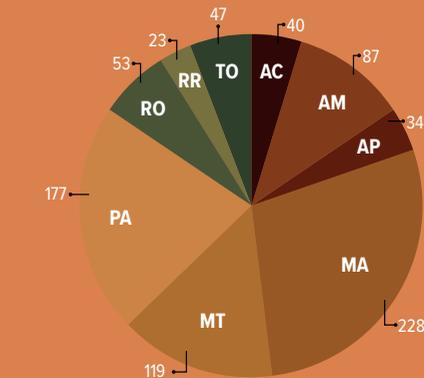
Percentage of municipalities with Internet access in Brazil and in states of the Legal Amazon, 2023.



Fonte: IBGE, 2023

**92.5%** IS THE AVERAGE PERCENTAGE OF BRAZILIAN HOUSEHOLDS WITH INTERNET ACCESS.

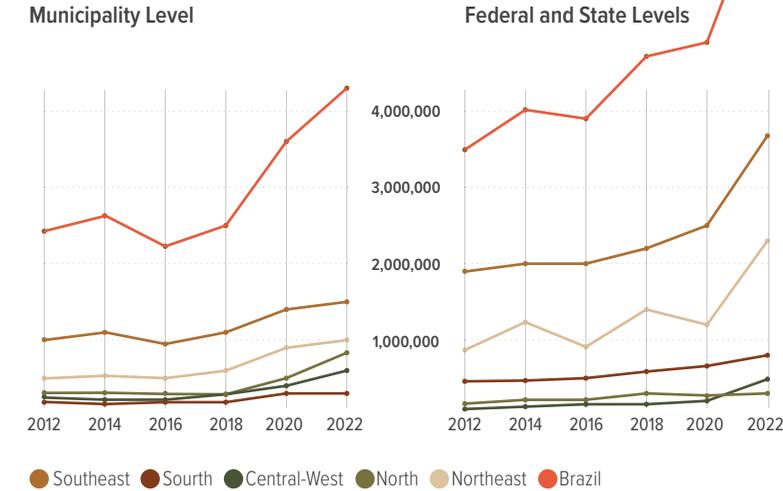
## Cultural points in the Legal Amazon



# Investments in the Sector

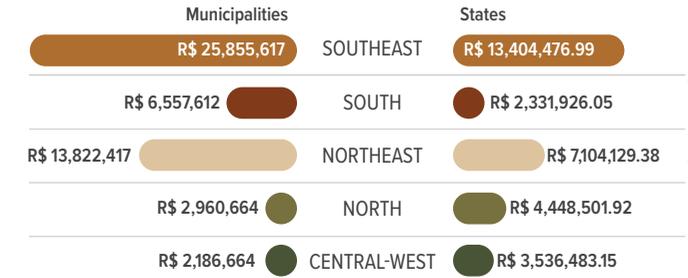
## Public Expenditure on Culture in 2022

Source: SICC, IBGE, 2022.



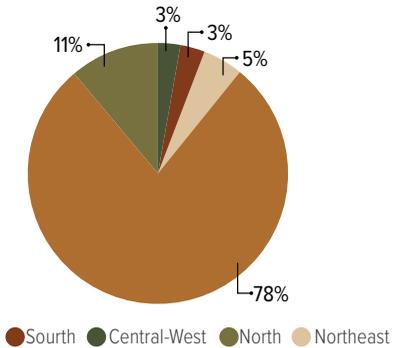
## Cultural Expenditure at the Subnational Level

Average for 2012-2022 (x R\$ 1,000.00)

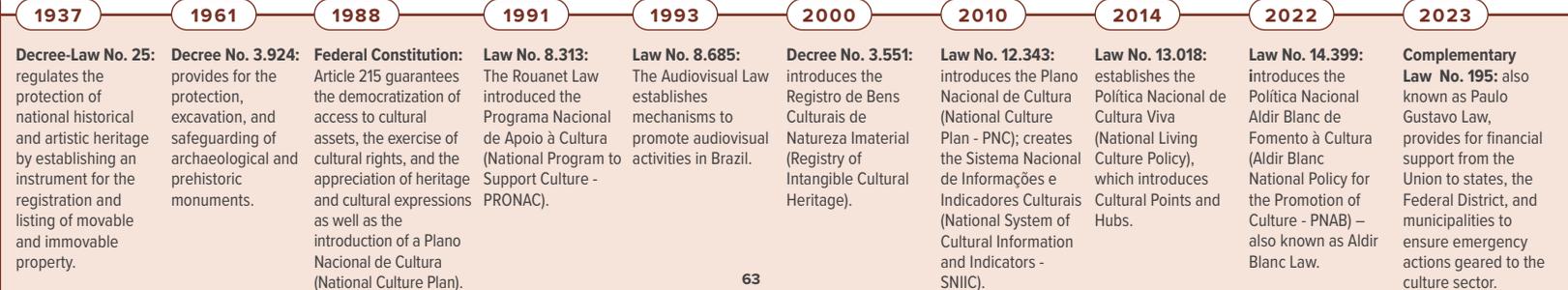


## Tax Incentives

Tax incentives in the culture sector represent indirect government expenditures, implemented through the tax system via government tax waivers. It exempts companies from paying the due amount, allowing them to invest in projects that have been approved for fundraising in capital markets. One such example is the Rouanet Law.



## LEGAL AND HISTORICAL LANDMARKS

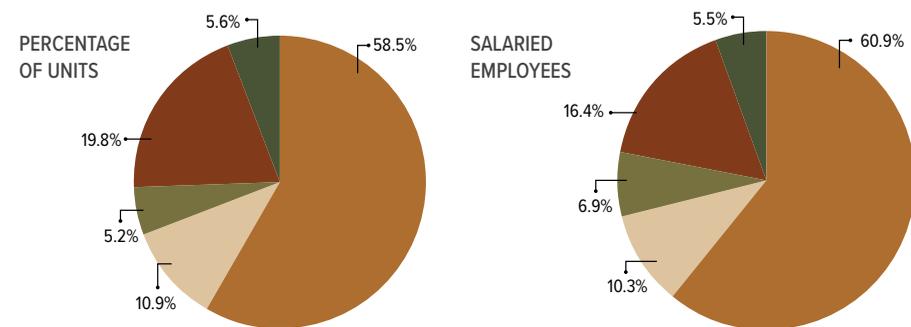


# The Economy of Culture

Salaried jobs in the culture sector and opportunities for better average income are concentrated in the Southeast region. The states of the Legal Amazon account for a minor share of the formal cultural sector in the country.

## Distribution of Local Units and Salaried Employees

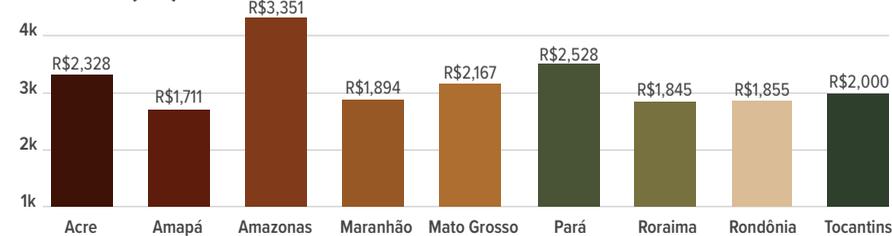
In the culture sector regarding total local units and salaried personnel, per region and federative unit (2021)



Legend: Southeast (orange), South (dark red), Central-West (except MT) (green), Legal Amazon (light green), Northeast (except MA) (tan)

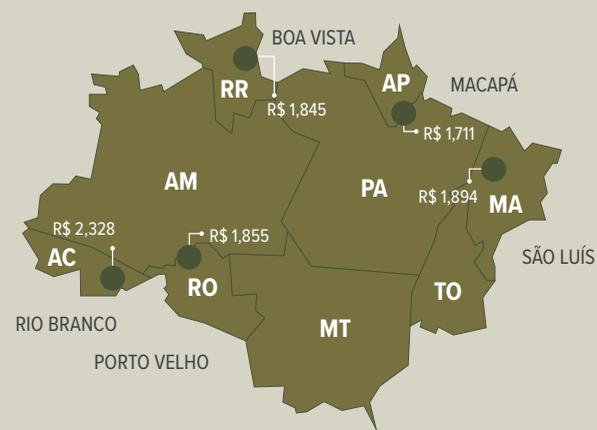
Source: IBGE, Surveys Department, Registry and Classifications, Central Register of Enterprises – 2021.

## Average Monthly Salary in the Culture Sector by State in the Legal Amazon (R\$)



Source: SICC, IBGE, 2022.

## Average Monthly Salary by Municipality in 2021

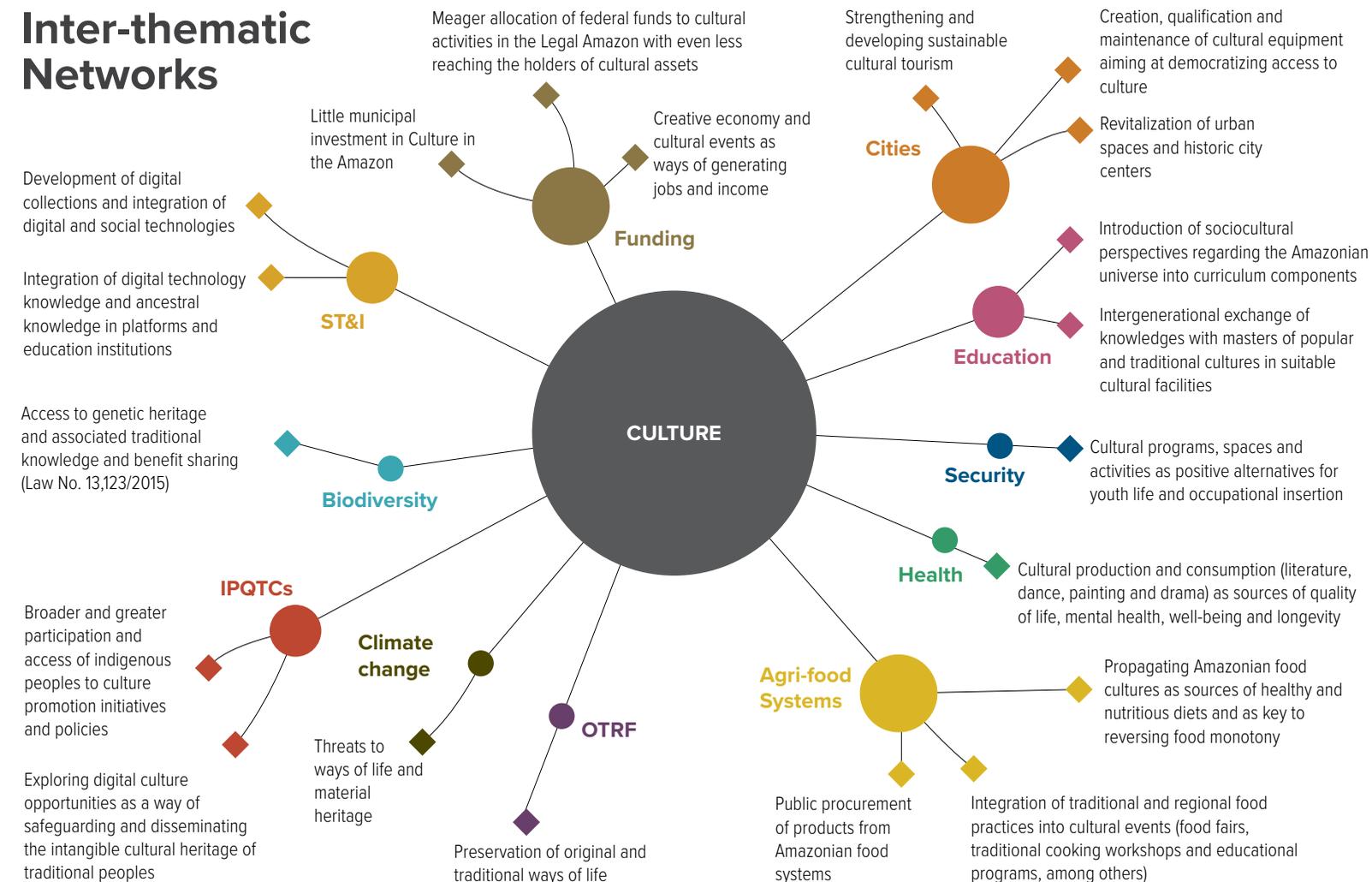


## THE FIVE STATE CAPITALS WITH THE LOWEST AVERAGE MONTHLY SALARIES IN THE CULTURE SECTOR ARE IN THE LEGAL AMAZON.



Source: IBGE, 2022.

# Inter-thematic Networks



04

# Energy



---

---

## ***Energia ancestral, 2024***

### ***Ancestral Energy***

#### **Auá Mendes**

Energy is here depicted from two universes. One is a property, an industrial property that needs and has political and private power, and the other is the energy of ancestry. The latter is the one that protects, that strengthens, the one that keeps these peoples and these communities sure of their convictions. The right to the territory, to the land, the right to having prospects in life. These two points are shown through the somewhat fast-moving river in the middle of nature and mother tree holding up these two houses.

---

---

Since the end of the 19th century, the development of the Amazon region has been characterized as a “history of loss and damage” because it benefits the country to the detriment of the region’s development. An emblematic example of this context is the series of hydroelectric power plants built between the 1970s and the mid-2010s to supply large consumption centers in other regions, which left a trail of liabilities and socio-environmental conflicts in the region.

In the second half of the 20th century, in the 1960s and 1970s, the government of Brazil began a process of integrating the Amazon with the rest of the country, encouraging its occupation through policies that influenced people migration and economic activities. That period was marked by major infrastructure works, such as roads (for example, the Trans-Amazonian) and hydroelectric power plants (Tucuruí, Santo Antônio, Jirau, Teles Pires, Lajeado, São Manoel, Belo Monte, among others). The construction of Tucuruí, which began in 1975 and was completed in 1984, was a significant milestone, positioning the Amazon as a potential hub for hydroelectric power generation.

Today, about one third (34%) of Brazil’s hydroelectric power generation capacity is located in the Legal Amazon (SCHUTZE, A.; BINES, L.; ASSUNÇÃO, J., 2022). The states in the region generated 25.7% of the country’s electricity in 2020, but consumed only 8.4% of the total generated in Brazil, that is, less than a third of what they generated (SCHUTZE, A.; BINES, L.; ASSUNÇÃO, J., 2022).

The asymmetry between supply and consumption can be verified in the subsystems of the National Interconnected System (SIN) installed in the region. The North region, represented by the North Subsystem, exports most of its hydroelectric power generation to the Southeast and Central-West systems, to the point that Rondônia is considered part of the Southeast system. In other words, the region is left with the socio-environmental impact of the construction and operation of hydroelectric plants, while the energy flows to other regions of the country (ONS, 2023).

Thermal power plants also play a significant role in energy generation in the region, but their socio-environmental impacts are less visible in the medium term. Responsible for generating 27% of all energy from fossil-fueled thermoelectric plants connected to the National Interconnected System (SIN) in 2020, the North Subsystem, comprising Amapá, Amazonas, Pará, Tocantins and Maranhão, emitted 7.5 million tons of carbon dioxide equivalent (CO<sub>2</sub>e) in the Legal Amazon (IEMA, 2022).

The repercussions of this view of the Amazon region as a provider of natural resources to benefit the development of other regions of the country are still visible in the current configuration of the Brazilian energy sector. The electricity generated by the region’s large and controversial hydroelectric power plants supplies the rest of the country, “without due returns, it is worth mentioning, in the same proportion as the competitive benefit<sup>2</sup>.”

Furthermore, the taxation of the energy generated is not done at the origin, but at the destination, as determined by the Federal Constitution. Thus, tax revenues that could benefit states holding energy resources through investments in health, education and security in fact go to the regions where energy is consumed.

### Inequality and Injustice

The supply of electricity in the Legal Amazon encompasses three systems: the National Interconnected System (SIN), which provides electricity to most municipalities and capitals in the region; the Isolated Systems (SISOL), which serve the other municipal headquarters and the State of Roraima; and the Remote Regions, made up of groups of residents far from municipality headquarters. They are served by small, private or community-owned electricity generators, powered by diesel, which provide electricity for short periods, three to four hours a day, due to the high cost of fuels.

In SISOL, access to electricity occurs through the use of generators that are powered by fossil fuels (90.7%) (SILVA, SANTOS et al 2024; EPE, 2023). More precisely, there are 196 Isolated Systems that serve 2.7 million people (EPE, 2023). The vast majority of electricity generated by SISOL plants comes from diesel (69.0%), followed by natural gas (21.7%). The remainder of the electrical energy is generated by renewable sources (8.0%

biomass, 1.1% hydraulic and 0.2% solar), as a means of reducing diesel consumption (EPE, 2023).

Residents of Remote Regions pay more for the low-quality electricity they use, as they are not served by public energy services, and also have to travel to buy fuel for their generators. Unlike common practice, they pay before consuming, which in itself demonstrates the significant energy injustice to which they are subject. This is compounded by the lack of access to other public policies, deepening their situation of social vulnerability and inequalities when compared to other social groups and regions in Brazil.

Though generating more energy than it consumes, and making this energy available to the rest of the country through the SIN, around 15% of the population of the Legal Amazon does not have access to generated energy on site (SCHUTZE, A.; BINES, L.; ASSUNÇÃO, J., 2022).

*“We need to communicate with the other villages, asking how the village woke up, how the leadership woke up, if everything is okay or if they are not okay. Or if they need to call the nurses to assist them. So, we need energy when we want to get information from other villages. Especially nurses, and technicians who work with the communities”* (Itaituba/PA).

Significant portions of the Amazon population face chronic situations of energy poverty, characterized not only by lack of access, but also by poor quality, high cost and low stability. *“It is*

*very difficult for us to have this access. There are some communities and villages that have generators. Oftentimes this generator is only turned on at night, for example, from 6:00 p.m. until the end of the nine o’clock soap opera on Globo TV [channel]. But fuel consumption is very high and it costs a lot to relatives’ pockets. In many villages and communities in our region, most people pay more than R\$120 per month in contributions, on average.”* (Santarém/PA).

### Key Region for the Energy Transition

The Legal Amazon is characterized not only as a source of strategic energy resources, considering that the current energy matrix is mostly renewable, but also as a key region for energy transition in Brazil and the world, which has demanded new minerals to expand generation from renewable sources and operationalize processes connected to decarbonization. Although there is a movement to present Brazil as an alternative supplier for these substances, the lack of geological knowledge makes the estimated potential inexact. According to the Geological Survey of Brazil (SGB), only 37% of the territory in the Amazon is mapped (BISPO, F., 2024).

From what is known to date, Brazil holds 94% of the world’s niobium reserves, 22% of graphite and 16% of nickel, in addition to representing 17% of rare earth reserves. The Legal Amazon holds 30% of Brazil’s reserves of these minerals<sup>3</sup>. Of those 30%,

4.4% are located in Indigenous Lands and 14.9% in Conservation Units (UCs) (INSTITUTO IGARAPÉ, 2023).

As a result, the Amazon has also been under pressure for mineral exploration. There are currently 5,046 mining applications registered with the National Mining Agency (ANM), requested by 807 companies, to explore minerals considered essential for the energy transition in the Brazilian Amazon. Applications to explore copper, aluminum, manganese, niobium, silver, nickel, cobalt, rare earths and lithium total 26 million hectares within the limits of the Amazon biome (BISPO, F., 2024), an area equivalent to 4% of this territory. Of these requests, at least 1,205 are in an area of direct impact for 137 Indigenous Lands (TIs), located up to ten kilometers from demarcation boundaries. In 390 cases, mining areas trespass on these territories, which is prohibited by the Constitution. The survey also found 1,207 requests overlapping 107 Conservation Units in the Amazon.

The protected areas under the most pressure are in the state of Pará, which concentrates more than half of all processes in the Amazon for these minerals (3,069 applications), aiming at the exploration of 14.6 million hectares, an area that represents 11.7% of the state’s territory and is larger than the entire territory of England (BISPO, F., 2024).

### The Importance of Energy for All

Universal access to energy has effects both on local devel-



*Cookeina speciosa*

It was first described as *Peziza speciosa* Fr. by Swedish mycologist Elias Magnus Fries in 1822. The new name combination was made by English mycologist Richard William George Dennis in 1994. This species is often mistaken for *Cookeina sulcipes* (Berk.) Kuntze and *C. tricholoma* (Mont.) Kuntze, which have different microscopic characteristics (Hermawan et al. 2022). There are reports of edibility in Mexico (Guzmán and Piepenbring 2010) and by the Ngäbe and Buglé peoples in Panama (De León 2022). The epithet “speciosa” comes from Latin and refers to the ascoma with a pompous, elegant, colorful or simply beautiful shape. *Cookeina speciosa* is characterized by the presence of three rows of hairs on the margin and microscopically by the ornamentation of the spore (Ortega-López et al. 2019).

opment, enabling access to health and education, and on the settlement of populations within their original communities. “So, one essential improvement for the community here on the island would be energy, because energy would bring other benefits, other forms of education to the region, other incentives for people, for teenagers, for young people, even for parents to have the opportunity to study, to have an improvement and a better quality of life in the region. Because coming to the city, going to the city becomes very difficult, very difficult.” (Barbacena/PA).

The guarantee of energy security usually brings with it several benefits linked to economic activity, food security and community sociability. “Our community is already able to carry out some activities in the evening, such as meetings, church rehearsals, folk dance rehearsals, evening events, since the arrival of electricity, as well as develop some activities that generate income and savings, such as storing fruit pulp, storing the fruit itself in the refrigerator or freezer, preserving food, and also some small businesses, such as selling sweets, juice, and frozen fruit bars we call ‘chupinhos’” (Santarém/PA).

Energy is a fundamental infrastructure sector for the provision of energy services (lighting, transport, refrigeration, communication, etc.) as well as for well-being and overcoming poverty<sup>4</sup>.

In this context, it is understood that energy security in the Amazon involves a delicate balance among economic develop-

ment, social inclusion and environmental protection. “What we want is for people to think of another way of producing energy without having to destroy the environment, without having to pollute rivers, and that way we will have clean and sustainable energy” (Guajará-Mirim/RO). The region, rich in natural resources, faces unique challenges in ensuring reliable and quality access to energy for all people.

In Amazonian communities, overcoming energy poverty is a basic condition for improving quality of life. “The same applies to health care. If power is on 24x7, the work of professionals, teachers, healthcare professionals and the community will be made easier, won’t it? This is what matters, this would change our daily routine, our daily lives.” (Jacareacanga/PA).

In other words, access to energy brings true revolutionary potential for these communities. “If we had access to energy 24x7, it would be much easier. Even in communities, where there are many people who depend on energy, for example, people who own small grocery stores, who work in sales, it would make their lives easier. It would greatly improve the lives of our relatives, here in this region where I live, in the Andirá indigenous area. It would bring much more income and more jobs” (Barreirinha/AM).

The Amazon Regional Development Plan (PRDA), created in 2012 and under the jurisdiction of the Superintendency for the Development of the Amazon (SUDAM), is one of the instru-

ments of the National Regional Development Policy (PNDR), established in 2007 with the purpose of reducing economic and social inequalities, both within the region and among regions. The PRDA is updated every four years, concurrently with the Multi-Year Plan (PPA)<sup>5</sup>.

Historically, PRDAs have emphasized the potential of hydraulic and oil & gas sources in the Legal Amazon for energy use. In contrast, they acknowledge the potential of solar energy and bioenergy for the region. Thus, they express a strong tension between the diagnosis of predatory development that has been occurring in the Legal Amazon and the search for a development model based on other energy sources.

“All people have the right to have access to energy, but it must also be clean energy” (Guajará-Mirim/RO). More recently, public energy programs and policies oriented towards decarbonization and human development seek to correct or mitigate this history of loss and damage, uncontrolled occupation and predatory exploitation in the context of the Legal Amazon. The Amazon Energy Program, launched in 2023<sup>6</sup>, aims to replace the consumption of fossil fuels used in SISOL thermoelectric plants with renewable energy sources, or make the interconnection of SISOL regions to the SIN.

The vast majority of the electricity generated by these plants comes from fossil fuels and present high loss rates<sup>7</sup>. “If it were easy to bring solar energy into villages, it would be

clean energy. Because it doesn't deforest to generate energy for the villages. It's not like a power plant. (...) When we want energy, for example, from a dam, we have to flood the river. And that will bring a lot of destruction in order to generate energy." (Itaituba/PA).

It is legally possible to hold renewable energy auctions to expand markets already served and to supply remote communities not yet supplied with electricity. Therefore, the energy transition in the Amazon, in addition to being positive in environmental terms, may also mean cheaper electricity bills for all Brazilians.

Another project that will promote the reduction of such consumption is the interconnection of forty locations to the National Interconnected System (SIN) by the end of 2028. SISOL's average emissions factor is sixteen times higher than that of SIN, i.e., it emits sixteen times more greenhouse gases per unit of electricity generated<sup>8</sup>. New connections were made to the SIN in 2023 (Parintins-AM, Itacoatiara-AM and Juruti-PA)<sup>9</sup>. And in 2025, the interconnections of Boa Vista and six other municipalities in Roraima (Alto Alegre, Bonfim, Caracaraí, Mucajaí, Normandia and Rorainópolis) are planned<sup>10</sup>.

The Luz para Todos (Light for All) Program, reissued in 2023<sup>11</sup>, establishes the supply of electricity to 226 thousand consumer units in the Legal Amazon by 2028 as one of its goals (IEMA, 2023). In this case, the alternative is the supply of

energy from renewable sources, with preferential implementation of off-grid photovoltaic systems, that is, systems disconnected from the distribution network of local concessionaires. Additionally, such systems must be combined with energy storage systems using batteries, in order to provide energy more reliably, avoiding power interruptions, which is one of the most frequent complaints from the populations served: "We still face many difficulties because most of the time consumption happens only during the day, when there is sunlight. At night it is very difficult, because the energy supply level of solar panels is often low." (Santarém/PA). Still, the challenge is still monumental in serving remote human settlements: "Sometimes, there is also no maintenance team nearby. So, when a cable breaks or there is a power outage, or a fuse on the transmission line blows, the maintenance team has to travel from Juruti, which is the neighboring municipality, to get here. And then, sometimes two, three, four days go by without power." (Santarém/PA).

"I speak for my children that it has changed a lot, because before they didn't have the opportunity to have access to the Internet, to be able to turn on the television whenever they wanted, to watch a cartoon or a film. When the weather is hot, you can turn on the fan, open the fridge, drink some ice-cold water, without worrying about running out of ice." (Barbacena/PA).

## Energy

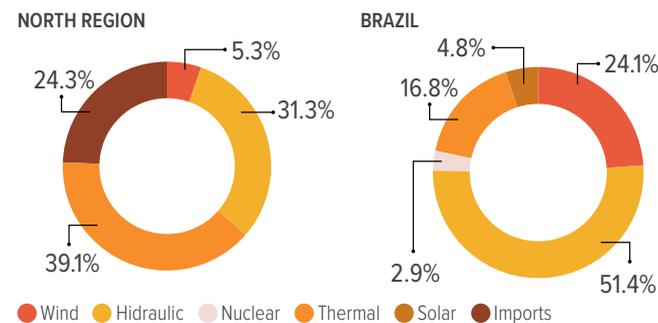
The Legal Amazon contributes significantly to the country's energy supply, primarily due to the hydroelectric power plants installed in its territory. However, the region reaps limited benefits from the energy it generates, despite the socio-environmental challenges faced by the territory and its inhabitants due to the presence of these large projects.

### Energy Generation vs. Use (2020)



Source: SCHUTZE, A.; BINES, L.; ASSUNÇÃO, J., 2022.

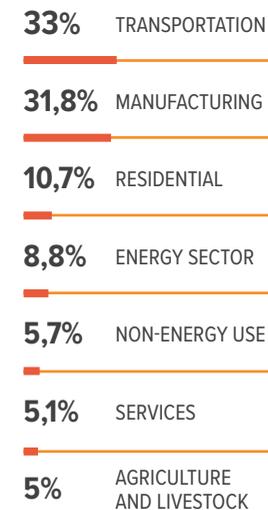
### Electric Power Generation by Source Type



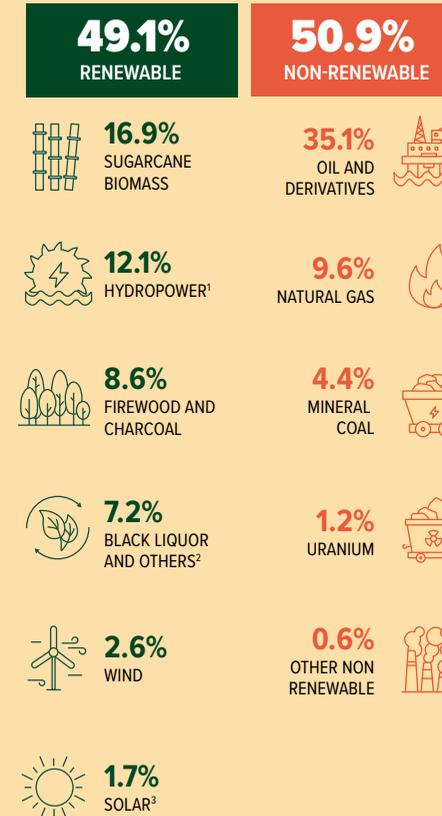
Source: ONS, 2024

**34%**  
OF THE HYDROPOWER  
GENERATION CAPACITY  
IN BRAZIL IS FOUND IN THE  
LEGAL AMAZON.

### Distribution of Domestic Demand for Energy.



### Energy Supply in Brazil



1. Includes electricity imports. 2. Includes black liquor, biodiesel, other biomass, biogas and industrial gas from charcoal. 3. Includes solar photovoltaic and solar thermal sources.

Source: EPE, 2024

# The Energy Infrastructure

Electricity is supplied through the National Interconnected System (SIN), Isolated Systems (SISOL) and the Remote Regions.

## SIN

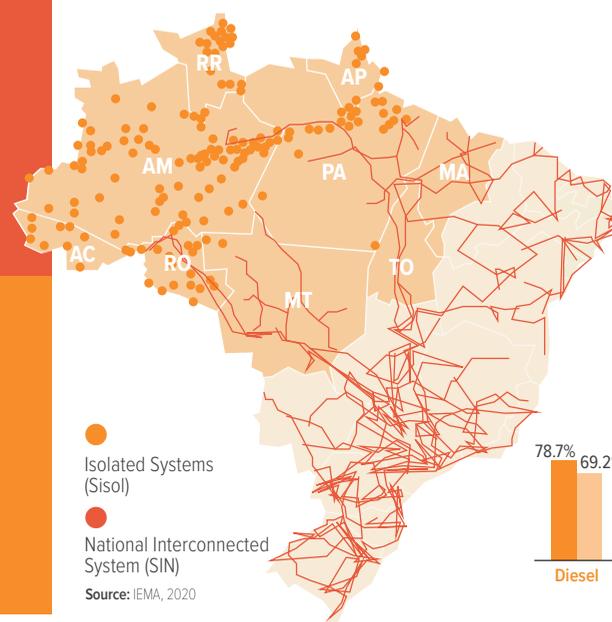
Set of electricity generation plants spread throughout the country and interconnected by a network of transmission lines totaling over 170 thousand km.

CAPITAL CITIES (EXCEPT BOA VISTA)

## SISOL

Electric power plants not connected to the SIN; most are located in the North region, serving from small communities to large cities, separating the Legal Amazon from the national energy grid.

MUNICIPAL SEATS

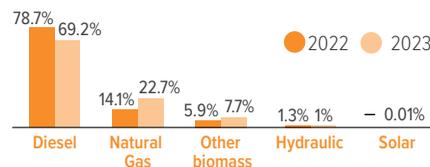


● Isolated Systems (Sisol)  
● National Interconnected System (SIN)

Source: IEMA, 2020

## Electricity Generation in Isolated Systems (Sisol)

Electric power generation in isolated systems totaled 4,030 GWh in 2023, compared to 4,011 GWh in 2022, an increase of about 0.5%. Most electricity generation comes from diesel oil and natural gas. However, isolated systems account for only 0.6% of Brazil's total electric power generation.



## Remote Regions

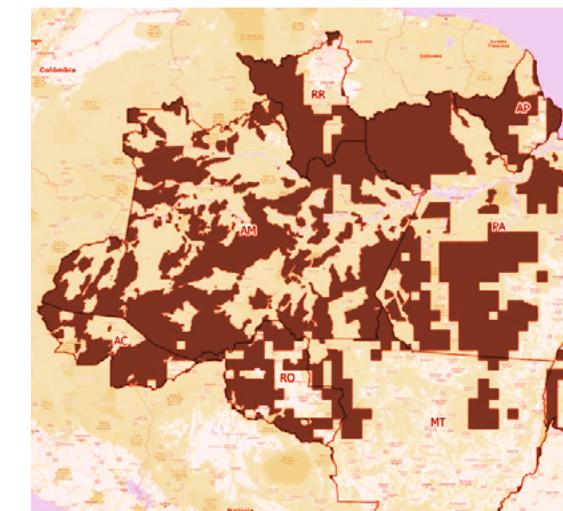
Consumers far from municipal seats, served mainly by their own or community-owned electricity generators powered by gasoline or diesel, which normally operate for three to four hours a day due to the high cost of fuel in the region.

OTHER LOCATIONS

# Energy Poverty and Insecurity

The concept of energy poverty includes low quality, unstable supply and high cost of energy. It primarily affects low-income populations or those in situations of socio-environmental vulnerability, such as rural settlements, isolated regions and traditional communities. It includes public or residential lighting, the use of household appliances, connectivity, entertainment, food preservation and thermal comfort, among other aspects of quality of life and social well-being.

## Distribution of Populations with no Electricity in the Legal Amazon



Source: IEMA, 2019



**1 MILLION**  
OF THE 27.8 MILLION PEOPLE LIVING IN THE LEGAL AMAZON STILL DO NOT HAVE ACCESS TO ELECTRICITY.

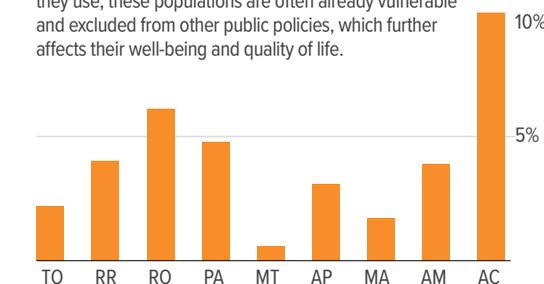
Source: IBGE 2022 AND IEMA 2019

## Lack of Energy

Source: IEMA 2019

Percentage of the population with no access to electricity in the states of the Legal Amazon.

Residents of remote regions are those who pay the most for access, availability and quality of the electricity they use; these populations are often already vulnerable and excluded from other public policies, which further affects their well-being and quality of life.



## Population with no electricity in special territories

Source: IEMA, 2019

**22%** CONSERVATION AREAS  
**19%** INDIGENOUS LANDS  
**10%** RURAL SETTLEMENTS

1994

**Law No. 2.793:** creates the Programa de Desenvolvimento Energético de Estados e Municípios (Energy Development Program for States and Municipalities - PRODEEM), which enables the supply of electricity to isolated communities, with the installation of micro-systems for local generation and use.

1998

**ANEEL Resolution No. 351:** creates the Sistema Interligado Nacional (National Interconnected System) and authorizes the National Electric System Operator to carry out electricity generation and transmission activities in the interconnected systems.

1999

**Decree No. 2:** creates the Programa Nacional de Eletrificação Rural "Luz no Campo" (National "Light in the Countryside" Rural Electrification Program) for the electrification of homes and rural properties in Brazil.

2003

**Decree No. 4.873:** Introduces the Programa Nacional de Universalização do Acesso e Uso da Energia Elétrica (National Program for Universal Access and Use of Electric Energy), also known as "Luz para Todos" (Light for All).

2009

**Law No. 12.111:** provides for electrical power services in isolated systems.

2013

**Law No. 12.783:** provides for concessions for the generation, transmission and distribution of electric power, the reduction of sectoral charges and tariff moderation; changes the applications and funding sources of the CDE, incorporating the CCC (Fuel Consumption Account); centralizes rural discounts in distribution tariffs and enables the use of resources from the Reserva Global de Reversão (Global Reversion Reserve - RGR).

2022

**Decree No. 11.059:** establishes the Programa Nacional de Universalização do Acesso e Uso da Energia Elétrica na Amazônia Legal - Mais Luz para a Amazônia (National Program for Universal Access and Use of Electric Energy in the Legal Amazon - "More Light for the Amazon"); regulates the Programa de Redução Estrutural de Custos de Geração de Energia na Amazônia Legal e de Navegabilidade do Rio Madeira e do Rio Tocantins - Pró-Amazônia Legal (Program for Structural Reduction of Energy Generation Costs in the Legal Amazon and Navigability of the Madeira and the Tocantins Rivers - Pro-Legal Amazon), which uses resources from the privatization of Eletrobras to replace fossil fuels with renewable energy sources.

2023

**Decree No. 11.648:** Introduces the Programa Energias na Amazônia (Energies in the Amazon Program), which aims to reduce the use of diesel oil in energy generation in the region, replacing it with renewable sources.

2024

**Decree No. 12.084:** includes the Programa Energia Limpa (Clean Energy Program) in the Minha Casa, Minha Vida housing program (MCMV Clean Energy Program), with the aim of promoting the implementation of renewable electrical power in its housing units.

# Potential Alternative Energy Sources for the Amazon

Energy security in the Amazon involves a delicate balance among economic development, social inclusion and environmental protection. The region, rich in natural resources, faces unique challenges in ensuring reliable and quality access to energy for all people.

## Biogas

It is a solution that encourages the proper treatment of organic waste and gives it a new use. It promotes the structuring of a new regional market and an increase in related opportunities.

**49%**

OF THE VOLUME OF MUNICIPAL SOLID WASTE (MSW) IN THE LEGAL AMAZON CAN BE USED FOR PRODUCING BIOGAS

**6%**

OF THE POTENTIAL OF BIOGAS GENERATED BY MSW IS CURRENTLY USED IN THE STATES OF THE LEGAL AMAZON



ANNUAL BIOGAS POTENTIAL FROM MSW IN THE LEGAL AMAZON:

**527.7**  
MILLION NM<sup>3</sup>

- 20 million cooking gas cylinders (two per household)
- 546 thousand homes with electricity

Biogas production can be implemented on small, medium, or large scale. On a domestic level, biogas is produced to replace cooking gas or firewood when preparing food in rural areas. In communities or cooperatives that produce cassava flour, for example, waste can be converted into biogas for use in the drying and roasting stages.

Source: INSTITUTO ESCOLHAS, 2021

## Solar Power

Off-grid photovoltaic system technology, associated with battery energy storage systems, is suitable for the Legal Amazon region due to its potential for local solar generation, its modularity, the absence of GHG emissions and its compliance with national public policies.

**226 thousand**

HOUSEHOLD UNITS CAN BE SERVED BY SOLAR ENERGY IN THE AMZL



**75%**

OF MANUFACTURERS IN THE SOLAR INDUSTRY SUPPLY CHAIN (assemblers, inverter and battery producers) are concentrated in the South and Southeast. Regional policies and incentives can help balance this distribution, promoting the installation of units in the Legal Amazon.

Source: IEMA, 2023

## Minerals

Nearly 30% of critical mineral deposits are in the Legal AMZ.



**Niobium Graphite Rare Earths Nickel**

Source: INSTITUTO IGARAPÉ, 2023

Pará accounts for more than half of all applications registered with the ANM for mineral exploration. The area to be explored covers 14.6 Mha – a territory larger than England.

Source: BISPO, F., 2024

**5,046**

REQUESTS FOR MINERAL EXTRACTION LICENSES IN THE LEGAL AMAZON (2024)

COPPER, ALUMINUM, MANGANESE, NIOBIUM, SILVER, NICKEL, COBALT, RARE EARTHS AND LITHIUM

**1,205** requests for areas affecting indigenous lands

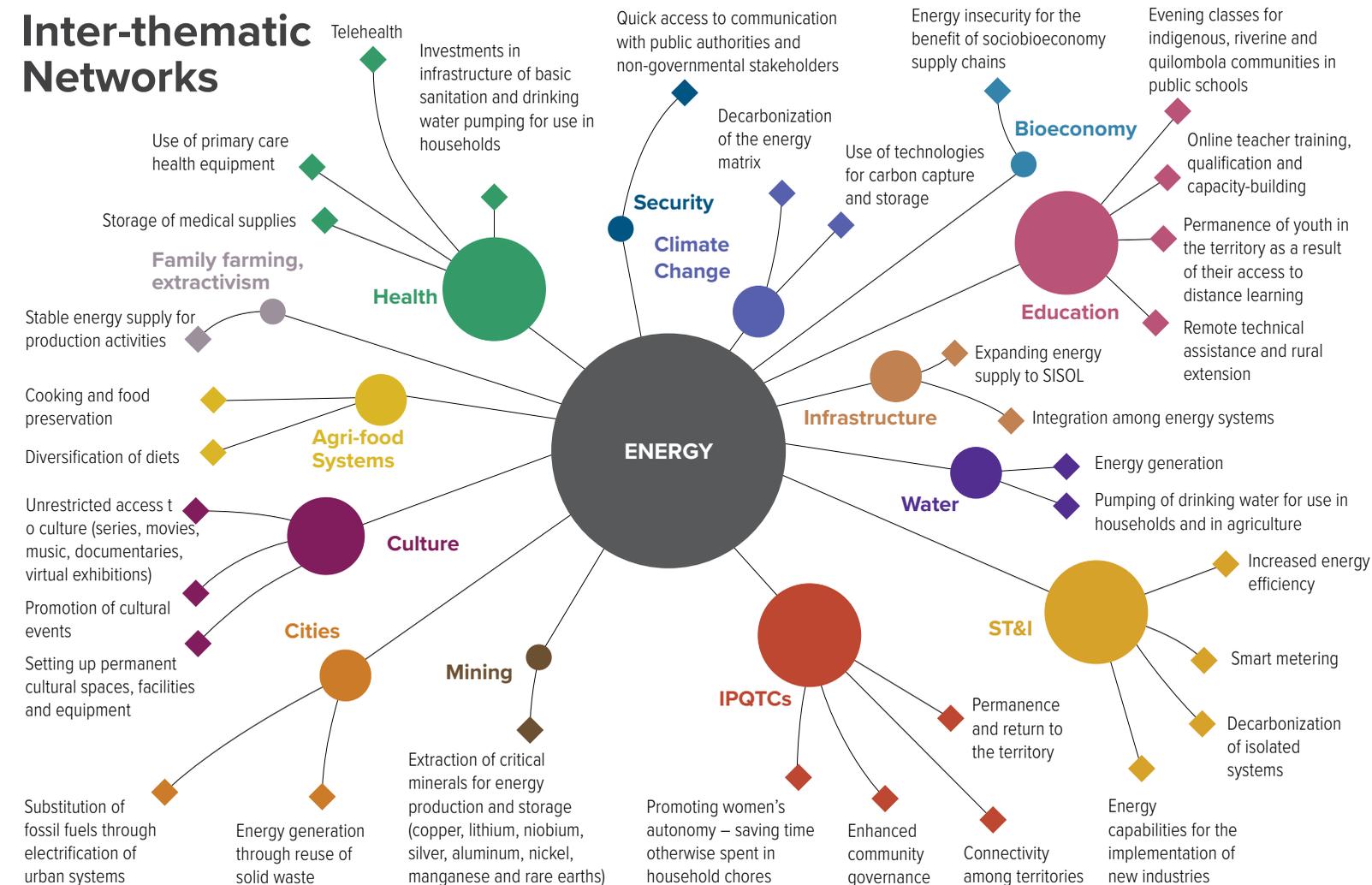


**1,207** requests overlapping 107 conservation units



Source: BISPO, F., 2024

# Inter-thematic Networks



# Land Use Planning and Land Tenure Regularization



---

## ***As vozes da periferia, 2024***

### ***Voices from the Hood***

Victor Hugo Reis

In a quite intense reinterpretation of “The Raft of the Medusa” by Théodore Géricault, 1818-1819, this digital, mixed media work presents a synthetic vision of human life abandoned to their fate. The survivors who are adrift at sea on a raft here appear as residents of the outskirts of Manaus, also abandoned. The picture of an irregular housing area of Manaus, in the background, highlights the challenges of land use planning and land tenure regularization faced in the territory, and enhances this reinterpretation not only through visual similarities but also through similar contexts, a context of abandonment and invisibility.

---

Whether in rural or urban areas, the history of territorial appropriation in Brazil shows that irregular occupation has always existed and continues to exist, especially in the case of unoccupied lands<sup>1</sup>. This issue is particularly challenging in the Brazilian Amazon, where there are large expanses of unallocated public land and enormous sociocultural and ecological diversity.

This diversity includes indigenous peoples, traditional communities, quilombola communities, migrants settled through agrarian reform, small and large farmers and ranchers, workers in mining, logging, infrastructure and industrial plants, as well as a considerable number of urban residents. What they all have in common is some relationship with the land and, in many respects, their interests are conflicting. Added to this scenario are the interests of the State (national security, infrastructure and major works) and of the domestic and international private sector, bringing increased complexity to the land issue.

The regulation of access to land for different purposes and the reconciliation of interests of different sectors regarding the territory involves historical, institutional, political, cultural, environmental and economic factors. The first step in addressing these factors is to understand the contours of territorial planning and land regularization.

Territorial planning, also understood as land use planning or spatial planning<sup>2</sup>, addresses the systematization of development

in a geographic space or the interaction among human activities, the space in which they are inserted and the system that both are part of. This definition is not fixed and may vary depending on the author, region and context (BAFARASAT, 2015).

Land regularization represents the conversion of merely “*de facto*” situations into fully legal situations. It refers to the resolution of legal uncertainty regarding the ownership (possession or use) of occupied properties (urban or rural). To achieve this, a series of technical, legal and administrative procedures may be required, namely land registry and topographic surveys, analysis of the ownership origin of properties, discriminatory legal actions, demarcations, plans to legitimize possessions, etc.<sup>3</sup>

Land tenure regularization, in theory, is a powerful instrument for tackling ownership issues. But in practice, it is remedial, as it comes into effect after the occupation has already taken place. In other words: land tenure regularization will only be effective if other policies for territorial planning are enforced in combination, so as to prevent irregular land occupation. Therefore, the two expressions go together: territorial planning and land (tenure) regularization (OTRF).

The study of territorial planning makes it possible to focus on different perspectives: land rights relations, land use planning and zoning, urban or rural issues, changes in land use, informal and irregular land occupation, among others. In Brazil, and espe-

cially in the Legal Amazon region, one of the perspectives that deserves urgent attention is land tenure regularization.

### Land Vacancies, Legal Uncertainty and Land Grabbing

To this day there is no consistent survey, at a national level, of how many properties are informal in Brazil, that is, which do not have a formal title document (recorded deed), in rural or urban areas. It is estimated that at least 141 million hectares, or 16.6% of Brazil's territory, are not covered by any georeferenced record (SPAROVEK et al., 2019).

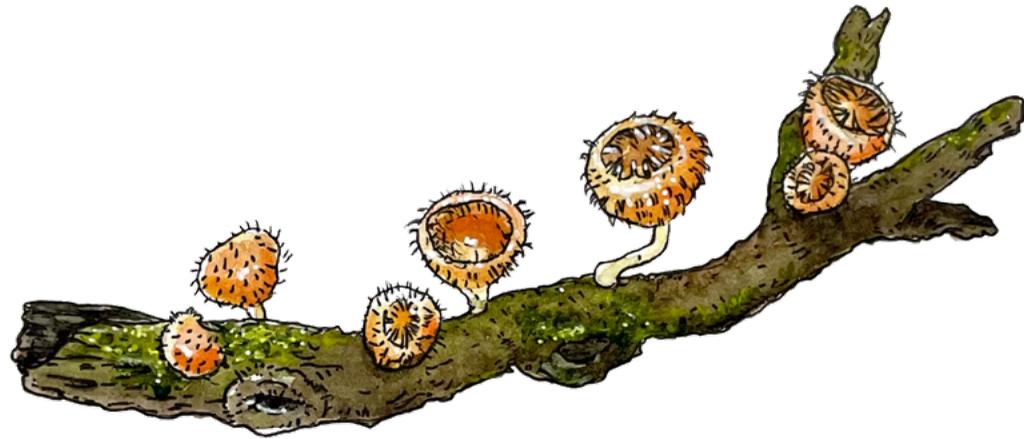
In the Legal Amazon, it is estimated that around 57 million

hectares, or 11% of its territory, are “land vacancies”. This means that in this area there is no reliable information about property ownership (INSTITUTO ESCOLHAS, 2023). In addition to land vacancies, there are several overlaps in ownership among public land categories and between public and private land categories.

The lack of precise records about who owns what creates a context of legal uncertainty regarding property, which affects the State's planning capacity – given that it does not know its own territory and its occupants adequately – and facilitates land grabbing operations. “*The fragile documentation situation regarding people's land tenure status does not allow us to move forward*

#### *Cookeina tricholoma*

This species was identified by French mycologist Jean Pierre François Camille Montagne in 1834, under the name *Peziza tricholoma* Mont. Collection was made by French naturalist Charles Gaudichaud-Beaupré, who began a voyage in 1832 aboard the ship L'Herminie, when he visited Brazil, Chile and Peru. Montagne's publication reports that this fungus was collected from a wooden beam, not far from Rio de Janeiro. The epithet “tricholoma” refers to the ascoma with trichomes or hairs on the edge or margin. There are reports of edibility in Mexico (Villarreal and Pérez-Moreno 1989), by the Bantu and Bagyeli people of Southern Cameroon (Dijk et al. 2003), and in Manaus by Komura et al. (2023).



*with business on land that we would, theoretically, have available to recover.”* (Rio Branco/AC).

Land grabbing<sup>4</sup> affects both small and large rural establishments. But it is more serious in the case of small-scale rural workers, given the combination of the lack of resources to defend their rights and the limited action of the State in defending them. In this context, land tenure regularization becomes a valuable tool for resolving or mitigating legal uncertainty regarding land properties resulting from land grabbing.

### A Thicket of Policies and Instruments

Compounding the issue is the fact that land regularization policies are fragmented, implemented by various bodies at municipal, state and federal levels of government, often without coordination or articulation. For example: the National Institute for Colonization and Agrarian Reform (INCRA) works on the regularization of settlements and quilombola lands; the Secretariat for Coordination and Governance of Federal Assets (SPU) works on the regularization of floodplain areas, marine lands and federal islands; the Chico Mendes Institute (ICMBio), of Conservation Units; the National Foundation for Indigenous Peoples (FUNAI), of indigenous areas; the State Land Institutes, of state lands; and municipal bodies, of urban areas.

As concerns legal and regulatory frameworks and public pol-

icies, there is a myriad of administrative and legal instruments that can be used in land tenure regularization processes. Among administrative instruments, there are the processes of recognition of Indigenous and quilombola lands, the creation of rural settlements (federal or state) and regularization programs (federal or state). Within the roll of judicial instruments, the most widely used are Discriminatory Actions, Adverse Possession and Judicial Expropriation<sup>5</sup>. Additionally, there is the extrajudicial adverse possession instrument as a more recent development that can also be used for land tenure regularization.

### Recent Advances

Nevertheless, advances have been made in strengthening the territorial planning agenda. Initiatives aimed at creating a multipurpose and integrated land cadastre are positive, such as that provided for in Law No. 10,267 of 2001, connecting spatial data flows between Real Estate Registry Offices and INCRA; this paved the way for the creation of the Land Management System (SIGEF)<sup>6</sup> a decade later, as a platform or instrument for visualizing available spatial data on private and public properties.

Successful public policies have also been implemented, such as the PPCDAm, which delivered one of the best results in the fight against illegal deforestation in the Amazon, and the Terra Legal Program (Law No.11,952/2009). Despite its limitations, this

was perhaps the largest public policy for Land Regularization in the Brazilian Legal Amazon<sup>7</sup>. *“Wherever Terra Legal has arrived and granted titles, deforestation and invasion were reduced. Because the value of a titled area appreciates. And the land market, this market that is advancing on the Amazon, does not want land with increased value.”* (Manaus/AM).

Conversely, *“where deforestation advances, it is generally where ownership is the most precarious, right? These precarious tenures, obtained through simple occupation. That’s it, that’s the exact expression, properties, holdings and tenure by simple occupation. These are the three categories that we have established, based on proof of ownership. And the regions with the most dramatic advances in deforestation are those where ownership mainly occurs through simple occupation, carried out by squatters or land grabbers, people who occupy land in a disorderly manner”* (Rio Branco/AC).

### Structural Challenges

But there are still several structural challenges related to territorial planning. One of them is the integration of data from various existing land cadastres, as well as from thematic cadastres such as environment-related ones (Rural Environmental Registry)<sup>8</sup> and those related to animal production (Animal Transit Form)<sup>9</sup>, among others. The effort to integrate them through the National System

of Territorial Information Management (SINTER)<sup>10</sup> presents an even greater challenge, which is the integration of urban parcel records. Another major difficulty in the Brazilian land agenda is recognizing the right to land of indigenous populations, quilombolas and other traditional communities. A fundamental step towards promoting a less conflictive environment, this recognition is still largely seen as a hindrance to economic development. *“If I can live on my land, why should I work on someone else’s? If I can, if I have the possibility of having the satisfaction of producing with my own hands and seeing the fruit of my production yielding income, bringing me wealth, I am not talking about being rich, but that wealth which is the satisfaction here inside, of being able to live on one’s own land.”* (Tomé-Açu/PA).

*“So, this gives us a little more security due to the fact that it is an indigenous area, and a mother area, we can say, of the municipality of Tomé-Açu, and an area approved, registered, definitively by FUNAI. So, we have this backing, we can say that”* (Tomé-Açu/PA).

The process of recognizing and promoting land security leads to the diversification of economic activities, strengthening traditional ways of life that are compatible with the conservation of nature and protection of fundamental human rights. *“They are approved in this land. Then, after they demarcated the area, there was a big conflict, right? After they started removing the farmers,*

*the people who planted rice, things got better for us, we have some cattle now. Where they were removed, the farmers allowed us to enter, that’s how life was. At first, we couldn’t even go out to fish, so the farmers let us enter the area, but now it’s easier for us. Now we can go fishing for our families. I also work, now each person makes an area to plant watermelon, corn, cassava. It became easier for us.”* (Pacaraima/RR).

Likewise, land regularization based on the notion of social justice is a major structural challenge, both due to the size of the demand and to the difficulty of developing a lasting and socially legitimate rule for its application, one that guarantees compliance with the social function of property and avoids possible legalization of land grabbing. *“Their territory was under threat [referring to riverine communities]. When we began to mobilize forces to help us think about a territorial protection arrangement, and we were thinking about an extractive reserve, we began to receive many direct threats from sectors of the elites of Roraima against our actions. Just to give you an idea of what I’m talking about, we were a small group of activists, within an entity called Associação Amazônia (Amazon Association), and then we began to suffer a barrage of complaints and accusations that ranged from biopiracy to exploitation of labor analogous to slavery, internationalization of the Amazon, presence of foreigners in the Amazon - in short, land grabbing.”* (Manaus/AM).

---



---

### THE CATALYST LAND FUND (FAF)

---



---

In response to these challenges, the Fundo Catalisador da Agenda Fundiária (FAF, or Catalyst Land Fund) was created. The Fund is a structuring initiative by the Amazon Concertation that aims to raise private funds in order to leverage the OTRF public agenda.

Its objective is to promote the recognition of community land rights and the demarcation of priority areas for the conservation of the Amazon. The land agenda has a broad scope and hence the FAF is focused on priority lines, such as the collection and allocation of public forests and/or those with high conservation potential, in addition to programs already included in the government agenda, such as the 5th PPCDAm.

The FAF’s governance structure includes three major councils and decision-making bodies: the Strategic (or deliberative) Council, which includes representatives of donors and the main State agencies responsible for the land agenda; the Technical-Administrative Council, responsible for evaluating and approving the Work Plans presented; and the Executive Secretariat, represented by the Fund’s financial mechanism (FUNBIO), which prepares the procurement notices and presents the results to the government agencies that developed Work Plans.

---



---

# Territorial Planning and Land Regularization

The regulation of access to land for multiple purposes and the reconciliation of interests regarding the territory involves historical, institutional, political, cultural, environmental and economic factors. At a national level, there is no reliable survey that shows how many properties, urban or rural, lack property registration.



**6.4%**

(or 54.6 million hectares) of the Brazilian territory, especially in the AMZL, consists of non-designated public lands.

Source: SPAROVEK, G. et al., 2019

**TERRITORIAL PLANNING:** Consists of planning land use in a given territory, for instance, by defining the area intended for agriculture and livestock, conservation, urban use, installation of infrastructure, recognition and protection of land use by traditional communities, among others.

**LAND GOVERNANCE:** It concerns the rules, processes and structures through which decisions about access to and use of land are made, how these decisions are implemented and enforced, and how conflicting interests are managed.

## LAND REGULARIZATION:

“consists of a set of legal, urbanistic, environmental and social measures aimed at regularizing informal settlements and granting title to their occupants, so as to guarantee the social right to housing, the full development of the social functions of urban property and the right to an ecologically balanced environment” (Art. 46 of Law No. 11.977/2009). In Brazil, the term means the recognition of land rights by individuals or groups regarding public lands, with the consequent public asset transfer and titling in favor of private entities.

- 1 TECHNICAL SURVEY
- 2 PERIMETER DEFINITION
- 3 AREA DELIMITATION
- 4 HOMOLOGATION
- 5 OBJECTION PERIOD
- 6 TITLING
- 7 EVICTION (IF NECESSARY)

## Land Administration System

### LAND REGISTRATION

CLEARLY IDENTIFYING PLOTS ON MAPS

**REGISTRATION OF OWNERSHIP OF A PLOT:** legal dimension of land tenure, which defines the rights and obligations associated with it.

**LAND WORTH:** economic dimension of the property, which establishes the value of the plot and, based on this, the collection of taxes

**LAND USE:** dimension of the property, which defines its use (rural or urban), related production activity and/or its purpose for preservation.

**LAND DEVELOPMENT ON THE PLOTS:** regulation as to what is permitted or prohibited in terms of buildings and facilities on the plot, license granting for the development of activities, among others.

# The Brazilian Territory

Most private rural properties in Brazil have not recorded significant recent deforestation. According to a survey by Nature, in a sample of analyzed CARs, only 15% had some deforestation detected after 2008 – half of which were potentially illegal.

Source: RAJÃO, R. et al., 2020

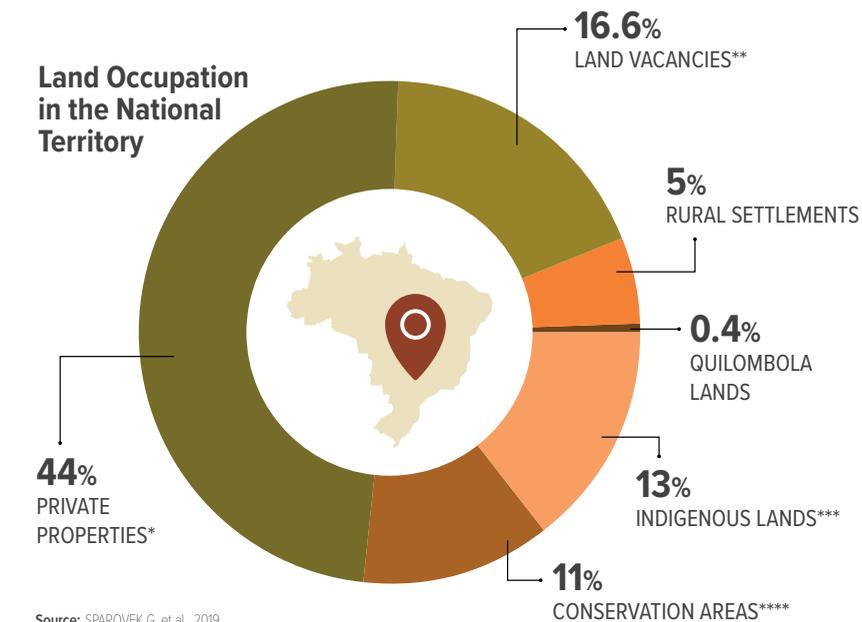
## Private Rural Properties x Deforestation



2% of all properties (totaling 17,557) account for 62% of all potentially illegal deforestation in the Amazon region and Cerrado savannah, the two largest biomes in the country. This group is largely responsible for limitations to the sustainable development agenda for Brazilian agriculture and for compromising the country's commercial prospects regarding deforestation-free exports.

Source: RAJÃO et al., 2020

## Land Occupation in the National Territory



Source: SPAROVEK, G. et al., 2019

\*half of these are not certified in the Land Management System (SIGEF) | \*\*not registered and there is no information in any official registry system | \*\*\*excludes 258 Indigenous Lands (TIs) not yet approved | \*\*\*\*excludes environmental preservation areas

## LEGAL AND HISTORICAL LANDMARKS

1850

**Law No. 601:** known as the Lei de Terras (Land Law), it provides for the unclaimed lands of the Brazilian empire.

1916

**Law No. 3.071:** includes provisions that transfer “terras devolutas” (unclaimed or vacant lands) from the public domain to the private domain of the state.

1964

**Law No. 4.504:** the Estatuto da Terra (Land Statute) defines latifundia and minifundia regionally, and stipulates two instruments for implementing agrarian (land) reform: expropriation for social interest and progressive taxation.

1973

**Law No. 6.015:** provides for public records, granting Real Estate Registry Offices public trust to guarantee the real right to property.

1988

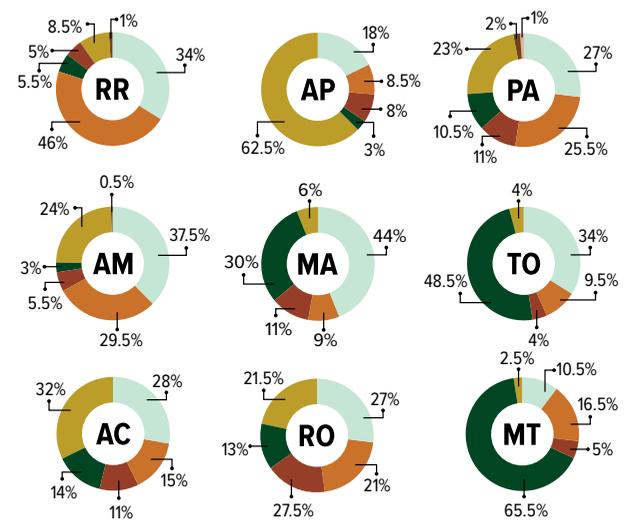
**Federal Constitution:** adopted the notion of social interest regarding rural properties; it brought advances in territorial planning relating to indigenous peoples (Art. 231) and quilombolas (Art. 68).

# Land Management in the Legal Amazon

This is a complex challenge, marked by land conflicts, unfinished land regularization and pressure from illegal deforestation. The lack of formal documentation and overlapping rights over the same territory hamper governance, and land regularization initiatives are essential to guarantee environmental protection and the rights of local populations.



Source: ALMEIDA, J.; ANDRADE, R. A.; BRITO, B.; GOMES, P. G., 2021.



2001

**Law No. 10.267:** proposes an organization of the territory through the Cadastro Nacional de Imóveis Rurais (National Rural Property Registry - CNIR).

2009

**Law No. 11.952:** establishes a federal land regularization program known as the Programa Terra Legal (Legal Land Program - PTL).

2012

**Law No. 12.651:** new Código Florestal (Forest Code). Creates the Cadastro Ambiental Rural (Rural Environmental Registry - CAR); its objective is to organize, monitor and adapt rural properties to environmental legislation, using georeferenced information.

2017

**Law No. 13.465:** provides for rural and urban land regularization, simplifying rural regularization processes, changing the rules for emancipation of federal agrarian reform settlements and reducing bureaucracy in urban land regularization.

## Inequalities Among Rural Landowners

87.3%

of rural establishments in the Legal Amazon, which represent 94.5% of all rural areas in Brazil, are led by men;

80%

of smaller rural establishments receive between 13% and 23% of all rural credit;

70%

of the food that reaches Brazilians' tables comes from smallholder farmers;

43%

of rural credit is granted to large rural properties (more than 1,000 hectares);

729

individuals and legal entities in Brazil declare themselves to be owners of rural properties with debts of over **R\$ 50 million** each to the State; this group owes nearly **R\$ 200 billion**, and some properties have enough area to settle **214,827 families** – almost twice the number of families that are camped out in Brazil today awaiting agrarian reform

Source: OXFAM, 2016

## Inter-thematic Networks

Protection of traditional ways of life as a result of land titling and guaranteed access to biodiversity resources

Control regarding conversion of rural areas into urban areas

Definition of rights over large areas

Definition of scope and administrative jurisdiction of institutions and levels of government

Allocation of public areas and spaces

Ensuring access to livelihood

Territorial security for settlement projects and small properties

Regulation of carbon markets and of payments related to keeping the forest standing

Delimiting and protecting territories

Right to consultation and free, prior and informed consent on interventions in traditional territories

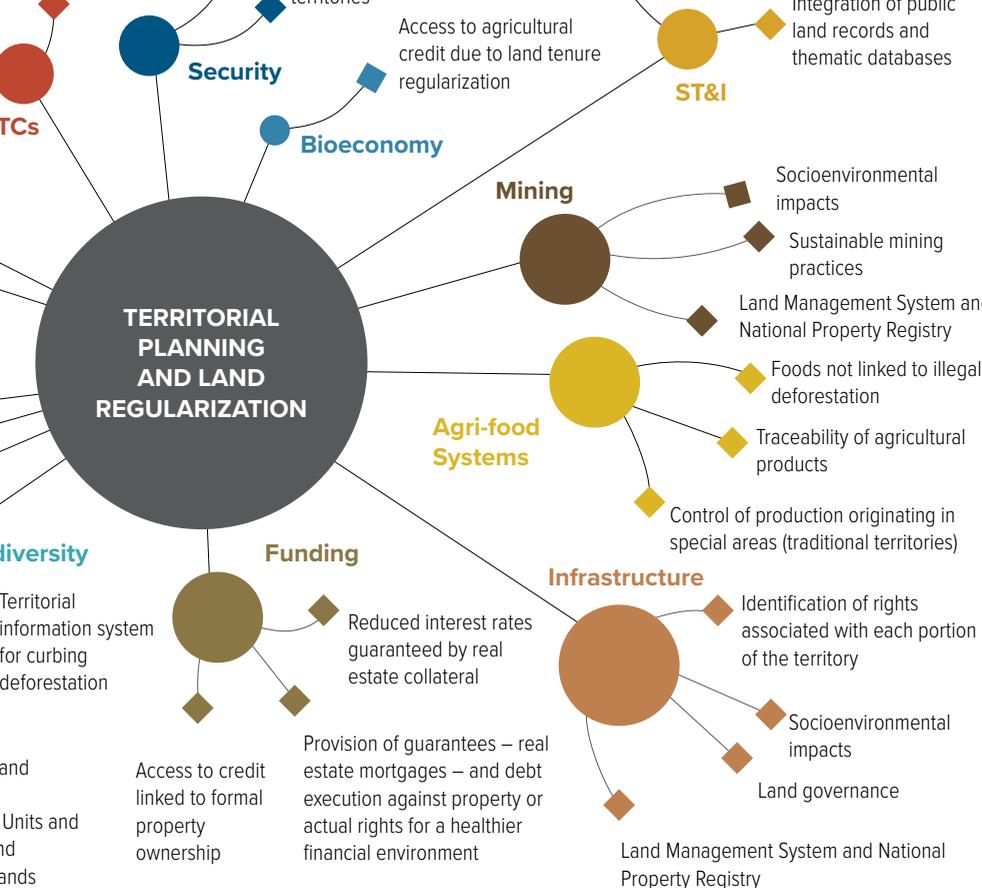
Control over the issuance of property titles, public asset transfers and/or precarious records

Legal certainty over the territories

Access to agricultural credit due to land tenure regularization

Improvement of georeferencing and geoprocessing technologies for monitoring the territory and properties

Integration of public land records and thematic databases



# Agri-food Systems



## Mani, 2024

### Andreia da Silva

The artist's memories of her family working in the fields inspired her to create this artwork. Her mother, here portrayed lying down, evokes the strength of women in the fields and the legend of Mani. Affective memories and recollections imbue her creation. Among the various types of cassava found in the Amazon, this one is called shrimp because of its pinkish color. Its bark is thinner than the others' and comes off more easily when it is peeled for making flour. When it was the shrimp variety, the children were happier because they didn't have to make so much effort to remove the bark. Food security is also depicted through the animal protein in fish, which here appear on the moon, which governs water and crop cycles. Everything looks integrated, the legend of the cassava in the mother's body and the moon with the fish. Common fish, and some that she (the mother) liked to fish. Life.

While the megadiverse territory of the Amazônias plays a central role in the production of forest-based foods, grains and meat for the region, Brazil and the world, the Legal Amazon has the highest rates of food and nutrition insecurity in the country (REDE PENSSAN, 2022). This contradiction is striking, especially considering that the area allocated to the agricultural sector in the region has quadrupled in the last 37 years (MAPBIOMAS, 2023).

Despite the vast biodiversity and the potential for using many species for human consumption, hunger is persistent in the Amazon territories and poor nutrition affects the health of the adult and youth population (INSTITUTO ESCOLHAS AND CÁTEDRA JOSUÉ DE CASTRO, 2024).

*“Nowadays we go to the supermarket and we can see that there is practically no diversity of food. Food ends up becoming very restricted. And this creates a dependency in people, to consume practically one single product... Like, I go to the supermarket. When I get there I'll find potato. I'll get potatoes... and there is also orange for sale. But they are not even the oranges from the region, local fruit, in other words, they are products, in most cases, that cannot be explained geographically... But the explanation comes when we start to realize that what we have there [for sale in grocery stores] is single crop production, different from settlement areas, quilombola communities, indigenous*

*lands... (...) The difference is that in settlement areas, in quilombola communities, in indigenous lands, in traditional territories, we see a diversity of food, because there is still biodiversity there, there is still a different way of thinking, which is to take care of the environment.” (São Luís/MA).*

How agri-food systems are established in the Legal Amazon is still a puzzle, since, as already ratified by the Concertation, there is not just one, but several Amazônias, each one entailing different agri-food dynamics.

In Amazonian cities, for example, food and nutrition security is a critical issue, given the major concentration of the population in urban areas, the high demand for food and the susceptibility of vulnerable groups to extreme climate events.

In rural areas, indigenous populations in the Legal Amazon have experienced critical situations of food insecurity, the causes of which are almost always directly linked to illegal mining, invasion of their lands, and deforestation. This is the case with the Yanomami people, who, in 2022, had more than 52% of children up to five years of age suffering from malnutrition (ARAÚJO, T.; DAVEL, A. P.; CARNEIRO, E. M., 2024).

Illegal mining and, with it, the uncontrolled use of mercury, poses one of the greatest threats to food security throughout the region, due to the contamination of rivers and fish, a staple food

in the territory as a whole. According to data presented by Nexo Jornal, a Brazilian newspaper, the concentration of mercury present in the Yanomami indigenous people's bodies rose from 1.4 to 15.1 µg/g between 1990 and 2018 (BESSA, 2023).

*“Because from the moment these companies take over these areas, these territories, they expel these families, they destroy these cultures, which are in fact several cultures. They erase the ancestry of all these people from history... And they also destroy the soil with this technological package and then comes the great industrialization. This package also contains an excessive amount of pesticides, which is what communities are experiencing today...”* (São Luís/MA).

### The Roots of Hunger

This situation experienced in the Amazon region is part of a global context of intensification of extreme climate events, with greater impacts on vulnerable social groups and on agricultural and livestock farming productivity (MISSELHORN, A.; AGGARWAL, P. K.; ERICKSEN, P.; GREGORY, P. J., 2012). Reflecting on food systems and their transformation is therefore crucial to curb the rise in social inequality and multidimensional poverty, the loss of biodiversity, and to promote human health.

But what are agri-food systems? According to the Food and

Agriculture Organization of the United Nations (FAO), these are systems that encompass the entire range of players and their interconnected value-added activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products originating from agriculture, forestry or fisheries, and parts of the broader economic, social and natural environments in which they are inserted. “A sustainable food system (...) provides food security and nutrition for all, in such a way that the economic, social and environmental foundations for generating food and nutrition security for future generations are not compromised. This means that: it is profitable in all aspects (economic sustainability); it has wide-ranging benefits for society (social sustainability); and it has a positive or neutral impact on the natural environment (environmental sustainability).” (FAO, 2018, p.1).

Agri-food systems are at the heart of community development, they are essential to life and reflect ways of being, doing and representing human diversity. After the COVID-19 pandemic, poverty rates worsened across the board. In 2023, an estimated 2.3 billion people, or 30% of the global population, faced moderate or severe food and nutrition insecurity. This context is compounded by projections of global population growth and the need to adopt more diverse and nutritious meals due to the increase in deaths from chronic non-communicable diseases (NCDs) and obesity.

Studies indicate that, to feed the approximately ten billion people who will occupy the planet in 2050, it will be necessary to produce 50% more food than is currently produced (Leck et al., 2015). However, it is well known that the combination of technology with agriculture on a widespread scale through the green revolution and the expansion of industrial agriculture, despite having exponentially increased productivity and food production and reduced hunger, has not been able to eradicate it. Furthermore, the development of public policies and technologies associated with large-scale food production, especially in developing countries such as Brazil, has implied high consumption of natural resources, notably land and water, and resulted in significant greenhouse gas (GHG) emissions, due to the conversion of native landscapes, the intense use of fossil-based fertilizers and the digestive process of livestock (SEEG, 2023).

Another consequence of the expansion of industrial agriculture is the feedback between monocultures and poor nutrition. Six products (rice, wheat, corn, potatoes, soybeans and sugarcane) account for more than 75% of the plant calories supplied globally. Furthermore, the incidence of non-communicable diseases related to a high consumption of ultra-processed foods that depend on these inputs, such as heart disease, type 2 diabetes and several types of cancer, has doubled in the last 30 years



*Lentinus crinitus*

*Lentinus crinitus* was initially described as *Agaricus crinitus* L. by Swedish botanist Carl Linnaeus in 1763. In 1825, mycologist Elias Magnus Fries, also Swedish, established the current name, with type locality in Jamaica. The holotype was collected by Irish botanist Patrick Browne in 1756. It is consumed by the Yanomami of the Sanöma group of the Awaris region, Roraima State. Because of its shape, they call these mushrooms Siokoni amo, which means “hairy anus” (Sanuma et al. 2016.) There are also reports of consumption of this species by the Ikpeng (Txicão) peoples reported by Fidalgo and Hirata (1979) in Brazil; Uitoto, Muinane and Andoke in Colombia (Vasco-Palacios et al. 2008); the Hoti people in Venezuela (Zent et al. 2004); the Patamona people in Guyana (Henkel et al. 2004); and the Zapara and Kichwa peoples in Ecuador (Gamboa-Trujillo et al. 2019).

(Abramovay et al, 2023). It is estimated that, worldwide, 43% of adults are overweight and 16% are already obese (WHO, 2024).

After leaving the UN Hunger Map in 2014, Brazil returned to it in 2022, making it clear that the experience of hunger in Brazilian households is a persistent and complex problem, which requires permanent vigilance and multisectoral solutions. The roots of the hunger situation in Brazil are not in the lack of food or the country's capacity to produce it, they are a consequence of multiple factors that bring together market forces and political decisions (CASTRO, 1984; BRAUN et al., 2023).

### **Culture and Food in the Amazônias**

In the Amazônias, food systems are strongly connected with fundamental human rights, public health and nutrition, indigenous peoples, quilombolas, traditional communities and family farmers, religions, biodiversity, land use and climate. *“So, when we stand up and talk about food culture, that food culture is mainly what we don't eat, it's what we think, what we live, what we cultivate... But it's not what we grow on the land. It is not the mechanical act of planting. It is not the mechanical act of cooking. It's not that. It is the symbolic and invisible act, an act of identity and existence that is present in all that”* (Belém/PA).

The relationship between culture and food, configuring a way

of eating, or food as culture, resonates in religion. *“There is no candomblé without food. It is physical and spiritual as well. There is no axé house without a kitchen”* (Belem/PA). Or, more precisely, in the relationship between the natural and the supernatural, considered as amalgamated elements. *“I must tell you about the woman from Cachoeira do Arari who turned into a pig and made beiju, and for her, making beiju was the light part of the charm [spell]”* (Belém/PA).

Food and culture have a constantly updated relationship, adaptable to contextual changes, resulting in new articulations, new meanings and new appropriations of elements from the food system. *“During the Círio of Nazaré period, you walk down the street and it only smells of maniçoba or some food in tucupi, that's the feeling. I once spent a Círio outside of Belém, for me it was super nostalgic. Mom helped popularize this trend, at a time when duck meat was very expensive. Mom would say: 'Look, duck is expensive, but there's free-range chicken, there's oxtail'... Then she said that everything you put in tucupi was delicious, it was like that”* (Belem/PA).

There are cultural markers, elements and resources specific to the biome that differentiate the diet practiced in the Legal Amazon from that practiced in the rest of the country, partly due to the intensive use of animal and plant species endemic to the region,

such as açai, pirarucu, tambaqui, etc. *“Tucumã is a fruit from this region, because there is a tucumã that is a fruit, a seed, which has a mass. In our region in Pará, there is a small tucumã that everyone is more familiar with. Here in the state of Amazonas there is this big one, a round one. You remove that first little layer, that shell, and between the shell and the seed there is this type of mass. It is fatty and very rich in nutrients. And a lot of people eat it for breakfast. And it's good, you don't need to cook it, it's very simple: just peel it, take the slices and eat them.”* (Itacoatiara/AM).

All this environmental and sociocultural diversity in the Amazônias came up against a monoculture model historically imported from Europeans. Although a significant portion of the expansion of the agricultural sector in the Amazônias is directly related to land grabbing and land issues, part of the growth of economic activity in the region has occurred, over the years, in a way that is not very aligned with a vision of sustainability.

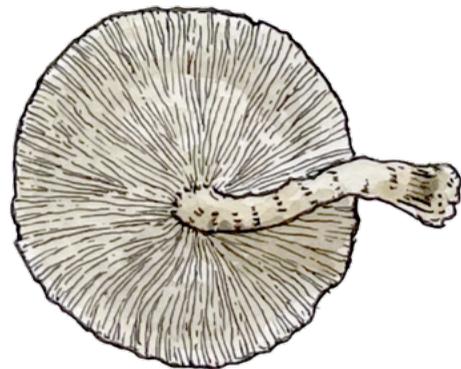
*“So this form of agriculture was imported from European countries. What is their agenda? One culture only. We had a diversity of crops here that are now in our backyards. On a small scale. If we were to add another production. And we have the plantations that arrived. They were brought by invaders. And that is monoculture. Just look at our commercial produce. What do we export today? Soybeans? Monoculture. Coffee? Monocul-*

*ture. Sugarcane? Monoculture. So these are the cycles. But we didn't react by increasing the agroforestry system. And we have already proven that the agroforestry system is present on a small scale in backyards because of its diversity. As it is very diverse, farmers do not default. If these farmers decide to ask for rural credit, that is. Or, if they don't have rural credit and plant on their own. They manage to be more sustainable on their property, on their agricultural plot. They achieve a healthier food culture. Healthy food”* (Belém/PA).

The agricultural model based on monoculture had – and still has – a great impact on Amazonian biodiversity. The expansion of the agricultural frontier from the Central-West region to the southwest and southeast of the Legal Amazon is preceded by slash-and-burn and illegal deforestation, leading to the conversion of native forest into pastures or agricultural production areas, and to the indiscriminate use of pesticides and fertilizers (BOMBARDI, 2023).

Brazil is one of the world's largest consumers of pesticides, and 90% of those in circulation in the country are applied on just five crops related to agribusiness: cotton, pasturelands, sugar cane, corn and soybeans (BOMBARDI, 2023). The states of Acre, Amazonas, Pará, Rondônia and Roraima had the highest percentage, considering their population, of cases of pesticide poisoning in the country in 2019. Acre, Maranhão, Mato Grosso, Rondônia

It will be essential to transform the Amazonian agri-food system by fostering more sustainable, inclusive and climate change-resilient agricultural practices.



and Tocantins, in turn, showed an increase of more than 10% in the number of rural establishments that use pesticides, which is consistent with the correlation observed between the increased use of these resources from the so-called Arc of Deforestation (BOMBARDI, 2023).

In addition to affecting biodiversity, industrial agriculture based on exports of food commodities and meat is responsible for significant greenhouse gas (GHG) emissions in Brazil, playing a major role in climate change. According to the Greenhouse Gas Emissions and Removals Estimation System, emissions from the agricultural and livestock farming sector in 2023 increased by 3.8%, totaling 601 million tons of CO2 equivalent, compared to 579 million tons in 2020. This has been the highest percentage growth since 2004, when there was an increase of 4.1% (SEEG, 2023).

#### The Transformation of Agri-food Systems

Given this scenario, it will be essential to transform the Amazonian agri-food system by fostering more sustainable, inclusive and climate change-resilient agricultural practices. This includes the implementation of research and public policies that promote the restoration of deforested areas and degraded pastures and the development of agricultural technologies that stimulate integration among production systems.

These technologies include: agroforestry systems that produce crops tapping into the region's rich biodiversity; ICLFS (Integrated-Crop-Livestock-Forestry System) techniques; the Guaxupé system (a Brazilian technique for intensifying beef cattle farming based on high-performance permanent pastures rich in legumes); practices for promoting animal welfare; strengthening agroecology on small and medium scales; encouraging crop diversification; efficient use of natural resources; reducing the use of pesticides and expanding the use of bioinputs; and combating food waste throughout the production chain.

*“You plant with focus. For example, in this season I focused on pupunha and açaí, I left it ready for them to choose, everything very organized. If we think about it, just considering pineapples, I planted about 4,000 pineapples there. We needed it, but we put in a lot of bananas, more cocoa, more coffee... Do you understand? So the agroforestry system is viable indeed, productively and economically, because you will have harvests at different times” (Porto Velho/RO). Agroforestry can even be adapted to the urban context; “this is the major advantage of agroforestry [urban]. You can plant whatever you want in small areas. You can build. And agroforestry gives you the opportunity to plan, to know what you want to eat. I want to eat mango. I’m going to plant mangoes” (Porto Velho/RO).*

Food production should not be thought of simply as an economic end in itself. *“It is possible to farm fish that do not need feed, that are self-sustaining, such as tamuatá, acari, cujuba and others, which, if there is no market for them, they guarantee our food” (Macapá/AP).*

In this sense, the cultural recovery of food consumption patterns should be encouraged, influencing the adoption of a healthier, more nutritious, regional diet with less environmental impact, based on the strengthening of available tools, such as the *Guia Alimentar da População Brasileira* (Food Guide for the Brazilian Population) and the list of products that make up the national basket of food staples (MINISTÉRIO DA SA. DE/SECRETARIA DE ATENÇÃO À SAÚDE/DEPARTAMENTO DE ATENÇÃO BÁSICA, 2014; MDS, 2024).

*“The system itself, the State and the municipality, still work with a lot of canned goods. The items sent to schools for student and teacher lunches, canned meatballs, preserves, sardines, are things that should have been taken off the menu, but they are on the menu and they are sent to schools. Work has to be taken very seriously on this food issue. For example, when they serve chicken soup, students hardly eat it. When it’s meatballs day, they have a second serving. They go for seconds because they like meatballs, which they don’t eat at home, but those are*

*canned meatballs full of... I don't need to explain that here. But this needs to be done not only with students. This has to come from the top, because, if the system orders it, people eat it. If the system doesn't send it, it's not available. And students eat whatever is available. And that's what we keep talking about, we keep repeating, we keep trying to raise awareness and provide guidance, but when it comes from the top, it's useless."* (Itacoatiara/AM).

It is possible to take advantage of the potential of Amazonian agri-food systems themselves, which in some regions have the distinctive characteristic of fully using all the elements of one single input. *"From manioc, here in the Amazon region, you can make flour, maniçoba, carimã... Until 1970, it was common for families here in the Amazon region to use carimã, both to bread fish and to make porridge, to make those round cookies, you can prepare tucupi, you can make gum, tapioca flour, to thicken other sauces, to prepare recipes differently, farinha d'água (water flour), you can make beiju. The only state that uses all manioc byproducts is Pará."* (Belém/PA).

Furthermore, with the right incentives, the diverse agri-food systems from the Amazônias can contribute to changing eating habits on a national scale. *"Because I am aware that there is harm, an opportunity cost in consuming meat. Environmental*

*cost, gigantic water consumption, pastures, environmental degradation, those who are within the ecosystem know the cost of consuming animal meat. But if we could... 50% of the Brazilian population says they are flexitarian; if we could increase this percentage to 55%. Considering this new percentage over a total of 200 million inhabitants, how many people consuming alternative protein will we have in the future? And for that we need tasty alternative proteins, because people who eat meat won't eat just any vegan burger, they won't eat something full of additives, you know? And with this we encourage the entry of new flexitarians into the circle."* (Manaus/AM).

Amazonian products, or products made from Amazonian biodiversity, such as tucumã meat, thus have enormous potential, which involves the (re)cognition and promotion of forest foods. *"“Oh, it's the exotic flavor.' No, the taste [from the tucumã meat] is like any other flavor, like garlic, like tomato. We have to normalize Amazonian flavors instead of calling them exotic. Because you eat exotic foods once in a while, but what is not exotic, you eat every day. So we need to work on this consumer awareness. So, we're going in, we're validating this, because it's never been done, right? And after we clear these paths and close the deal on this development model, we'll be ready to apply it to another chain."* (Manaus/AM).

In the Amazônias, the transformation of the food system unequivocally involves a fairer and more equitable distribution of land, of healthy food and of resources available in government credit programs. A dynamic that would potentially provide rural workers and vulnerable populations with means of production and access to better working conditions and affordable, regionally diverse quality food.

This transformation also involves reviewing fiscal policy, especially with regard to differentiated taxation of fresh and ultra-processed foods, and the articulation of public policies that strengthen family farming, encourage the local production and marketing of pesticide-free foods and promote access to markets for small producers, in addition to the already well-known government procurement markets (Food Acquisition Program - PAA and National School Feeding Program - PNAE). *"Yes, it is definitely a revolution to plant your own food, to know what you want to eat, to eat something and know where you planted it, I'm really proud of that! And the pride that comes from preparing a meal, a dish, all made with things that you picked, that you planted... It's a satisfaction combined with happiness, with duty fulfilled, satisfaction of doing something good for the planet."* (Porto Velho/RO).

*"Today, I try to talk to them [agribusiness farmers]. And sometimes, when we talk, they start to examine their conscience, they*

*begin to realize... Man, I think we're doing it wrong... I'll try to change my way of thinking. And start implementing regenerative systems, you know?"* (Porto Velho/RO).

Climate change poses significant challenges to the Amazonian and Brazilian agri-food system, requiring mitigation and adaptation strategies that mobilize ancestral knowledges from traditional communities, social technologies and investments in innovation, as well as an urgent and coordinated response from governments, the private sector and civil society. *"Today I feel like I'm inside the cockpit of an aircraft called the Amazon, which is flashing red warning lights everywhere. This summer there was no water to sail or to drink. No water in Amapá. You see salt water advancing. Shrimp disappearing. So these are examples of warning signs"* (Macapá/AP).

# Agri-food Systems

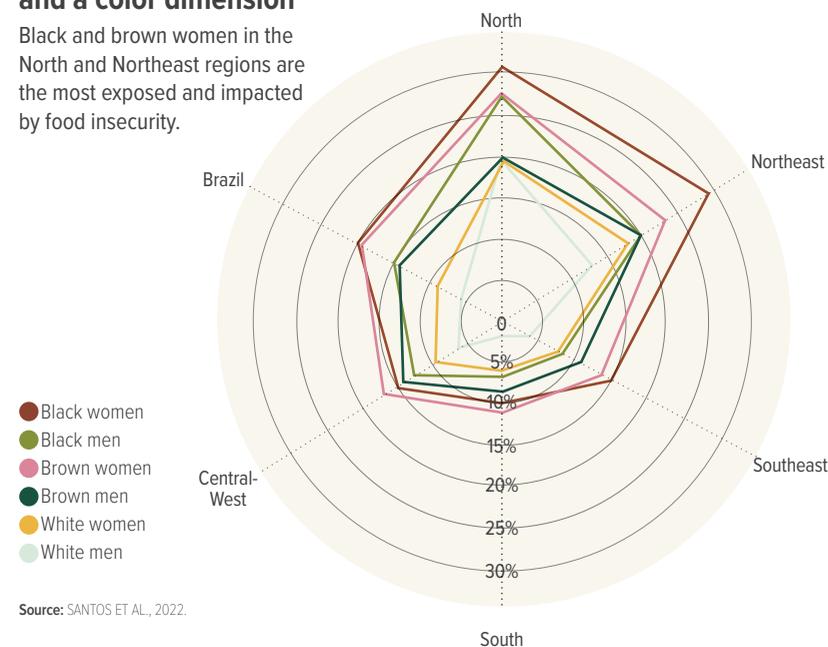
## Food and Nutrition Security

Amazonian diets reflect the sociocultural and biological wealth of the territory, including ingredients from indigenous, quilombola and riverine cultural traditions, such as fish, cassava flour, açai and maniva; from the northeast and south regions; and from Portugal, Japan, Lebanon and countries in Africa and Latin America. However, despite the diversity and abundance of foods, the most severe forms of food insecurity affect the largest shares of the population in the North (45.2%) and Northeast (38.4%) regions.

Source: REDE PENSSAN, 2022

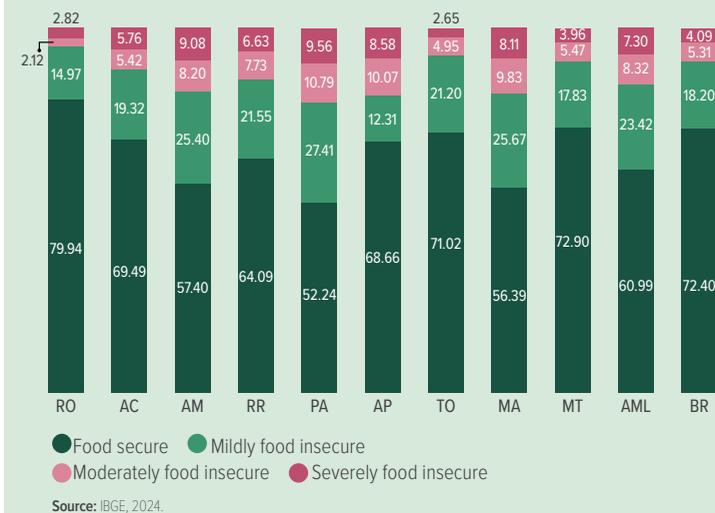
## Hunger has a place, a gender and a color dimension

Black and brown women in the North and Northeast regions are the most exposed and impacted by food insecurity.



Source: SANTOS ET AL., 2022.

## Food Security in Households in the Legal Amazon and Brazil



Source: IBGE, 2024.

## Definition of Food and Nutrition Security

“Article 3: food and nutrition security entails ensuring everyone’s right to regular and permanent access to quality food in sufficient quantities, without compromising access to other essential needs. This is based on health-promoting dietary practices that respect cultural diversity and are environmentally, culturally, economically, and socially sustainable”

Source: LOSAN, Brasil, 2006



**33.1 MILLION** PEOPLE WENT HUNGRY IN BRAZIL IN 2022.

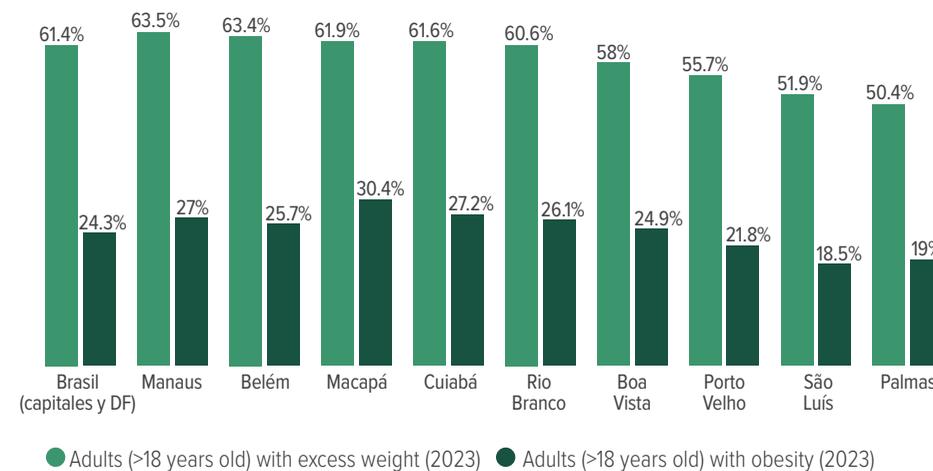
Source: REDE PENSSAN, 2022

## Food Monotony

Monotony of contemporary dietary patterns, based on a few species of vegetables (rice, wheat, corn, potatoes, soybeans and sugar cane), on animal-source foods, and ultra-processed products; and this, in turn, is linked to a monotony in the prevailing production systems and vice versa, generating negative impacts on public health, social justice, and planetary limits.

Source: ABRAMOVAY et al., 2023.

## Overweight and Obesity in the Legal Amazon Capitals

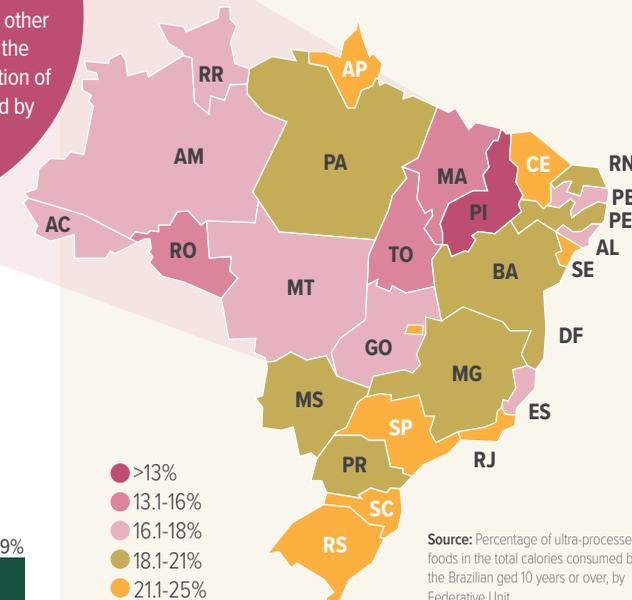


Source: INSTITUTO ESCOLHAS, 2022

In the North Region, the consumption of ultra-processed foods increased significantly, jumping from 14.57% between 2008 and 2009 to 17.52% between 2017 and 2018, thus presenting higher growth than in other regions of the country. Among the indigenous population, consumption of ultra-processed foods increased by 5.96% from 2008 to 2018.

Source: LOUZADA et al., 2023

## Share of Ultra-processed Foods in the Diets of Brazilians



Source: Percentage of ultra-processed foods in the total calories consumed by the Brazilian aged 10 years or over, by Federative Unit.

Poor eating habits are risk factors for the development of chronic non-communicable diseases, such as all types of cancer, diabetes, and cardiovascular and respiratory diseases. In 2019, 54.7% of deaths recorded in the country were associated with these conditions.

Source: INSTITUTO ESCOLHAS AND CÁTEDRA JOSUÉ DE CASTRO, 2024

# Rural Establishments and Agricultural and Livestock Production

Between 1985 and 2022, the area allocated to agricultural and livestock activities in the Amazon increased significantly. Livestock farming is a prevalent activity in the region, and is carried out in 47% of rural establishments, 75% of which are run by family farmers. Temporary crops come second, and are carried out in 33% of rural establishments. More than half of this area is used for the cultivation of soybeans (10.9 million hectares), corn (5.7 million hectares) and cotton (623 thousand hectares). Fishing and aquaculture account for less than 3% of rural establishments.

Source: 2017 AGRICULTURE AND LIVESTOCK CENSUS; MAPBIOMAS, 2023.



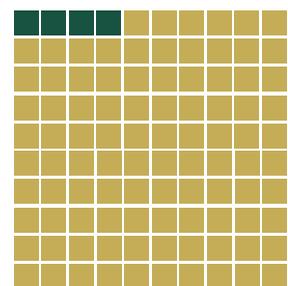
10%

ONLY AMONG RURAL ESTABLISHMENTS IN THE LEGAL AMAZON HAVE SOME ACCESS TO TECHNICAL ASSISTANCE, MOST OF WHICH RENDERED THROUGH GOVERNMENT PROGRAMS OR COOPERATIVES. THAT NUMBER DROPS TO 8% IN THE CASE OF FAMILY FARMING.

Source: 2017 AGRICULTURE AND LIVESTOCK CENSUS.

## Rural Establishments X Occupied Area

Source: 2017 AGRICULTURE AND LIVESTOCK CENSUS.

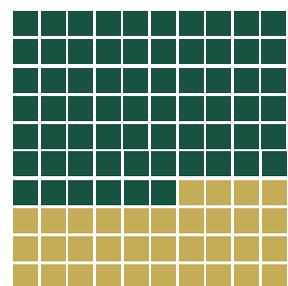


4%

of all rural establishments (81 million hectares) are Medium (500 to 1,000 ha) or Large (>1,000 ha).

96%

of all rural establishments (39.7 million hectares) are Micro (up to 50 ha) or Small (50 to 500 ha).



66%

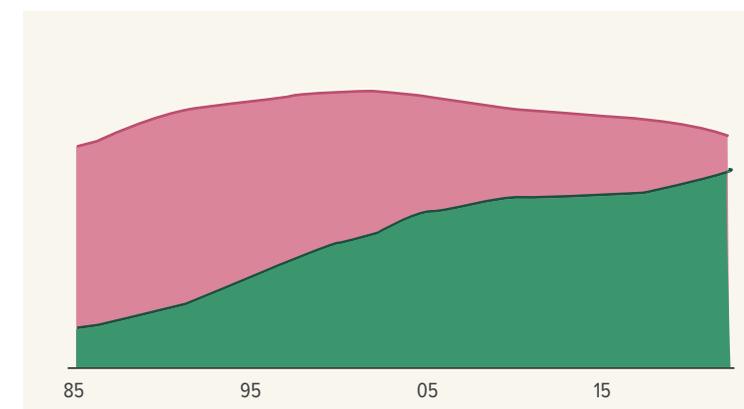
of the total rural area (about 81 million hectares) belongs to Large Properties (>1,000 ha).

32%

of the total rural area (approximately 39.7 million hectares) is divided among Micro or Small Properties.

## Evolution of Pasture Areas in the States of the Legal Amazon and the Rest of Brazil (1985-2022)

Total pasture areas in the states of the Brazilian Amazon increased from 17.5 million hectares in 1985 to approximately 75.3 million hectares in 2022, representing an increase of 330% over this period. In the other states, pasture areas grew by only 4% over the same period (from 85.4 million hectares to 89.0 million hectares). Cattle farming is concentrated in RO, PA, RR, TO and MT, but is present throughout the territory and is conducted by large, medium and small producers.

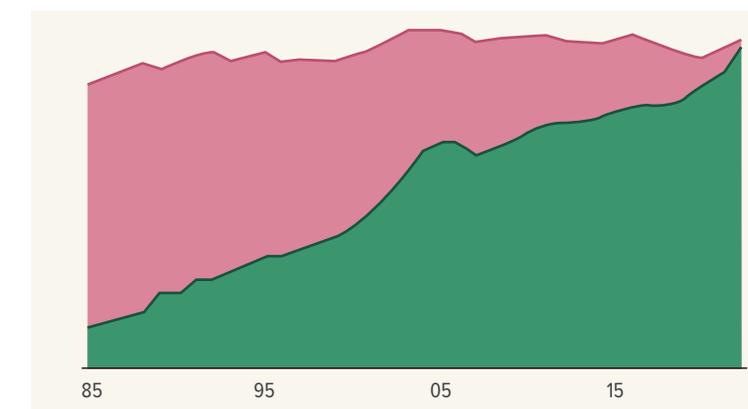


Source: CITE, 2024.

● Legal Amazon  
● Other Brazilian States

## Evolution of the Cattle Herd in the States of the Legal Amazon and the Rest of Brazil (1985-2022)

The cattle herd in the Legal Amazon grew by approximately 593% between 1985 and 2022 (from 15.1 million head to 104 million head). In the rest of the country, the cattle herd grew by approximately 14% (from 93 million head to 107 million head). In 2022, the cattle herd in the AMZL states corresponded to 49% (104.3 million head) of Brazil's cattle herd (211.3 million head).



Source: IBGE, 2022; CITE, 2024.

● Legal Amazon  
● Other Brazilian States

1989

**Law No. 7.802:** creates the Lei de Agrotóxicos (Pesticides Law), which defines and regulates the registration, use, production, marketing and control of pesticides, as well as their components.

1995

**Law No. 9.148:** establishes the Programa Nacional de Fortalecimento da Agricultura Familiar (National Program for Strengthening Family Farming - PRONAF); its main objective is to offer accessible credit and favorable conditions for smallholder farmers.

2003

**Law No. 10.696:** Article 9 creates the Programa de Aquisição de Alimentos (Food Acquisition Program - PAA), which facilitates the purchase of food with no need for bidding processes, thereby enabling family farmers to access the government procurement market.

2006

**Law No. 11.346:** enacts the Lei Orgânica de Segurança Alimentar e Nutricional (Organic Law on Food and Nutrition Security - LOSAN); establishes the Sistema Nacional de Segurança Alimentar e Nutricional (National Food and Nutrition Security System - SISAN); defines the concept of food and nutrition security; and emphasizes the importance of civil society participation in public policies.

2009

**Law No. 11.947:** regulates the Programa Nacional de Alimentação Escolar (National School Meal Program - PNAE), guaranteeing the provision of school meals to all students in basic education; the PNAE requires that at least 30% of the resources transferred by the Fundo Nacional de Desenvolvimento da Educação (National Fund for the Development of Education - FNDE) for school meals be used to purchase products from family farming.

2010

**Constitutional Amendment (EC) No. 64/ 2010:** includes food as a fundamental social right in Brazil; this means that the State has the obligation to create conditions for everyone to have access to quality food, in sufficient quantity, without compromising other essential needs.

**Decree No. 7.390:** regulates the Política Nacional sobre Mudança do Clima (National Policy on Climate Change - PNMC) and details the sectoral goals for mitigating and adapting to climate change; establishes the ABC Program as one of the main initiatives for the agricultural and livestock sector to reduce GHG emissions, integrate technologies to increase productivity and conserve natural resources.

2012

**Decree No. 7.794:** Introduces the Política Nacional de Agroecologia e Produção Orgânica (National Policy on Agroecology and Organic Production - PNAPO); it was created with the objective of integrating, articulating and adapting policies and programs that promote agroecology and organic production, especially among family farmers and more vulnerable populations.

2014

**Guia Alimentar (Food Guide) for the Brazilian population:** public health and nutrition policy tool that offers guidelines and recommendations to promote healthy and adequate nutrition.

# Agriculture and Livestock, GHG Emissions, Climate and Biodiversity

Climate change affects production planning, supply, consumption, and food quality standards. Since 2020, the Amazon region - in particular the states of AC, AM, PA, and AP - has been suffering the effects of droughts and floods. Extreme weather events reduce production as well as the diversity of agricultural produce, thus resulting in economic losses and damage. Production fluctuations can lead to a decrease in the supply of local food, with potential impacts on availability and increased prices for the population.

**1/3**

of global greenhouse gas (GHG) emissions come from food systems. The global agri-food system emitted 16.5 billion tons of GHG in 2019, representing a 9% increase since the 2000s.

Source: ABRAMOVAY et al., 2023; SEEG, 2023; WORLD ECONOMIC FORUM, 2023.

**27%**

of GHG emissions in Brazil derive from agri-food systems

**80%**

of global deforestation and biodiversity loss is associated with agriculture.

## Food and Cities

The concentration of people in cities influences the dynamics of food production, distribution, consumption and disposal, uncovering demands and opportunities for generating new businesses, employment, income and health. At the same time, there are flaws in public policy, inequality and ongoing violations of the right to adequate food and nutrition. In addition to higher food prices, outlying urban areas have a smaller supply of natural produce and affordable restaurants, and a greater supply of ultra-processed products.

**80%**

of all food produced in the world is consumed in cities.

Source: EAT CITIES, 2022.

**27,4 MILLIONS**

people who went hungry in Brazil in 2022 lived in urban centers

Source: REDE PENSSAM, 2022.

**80%**

of the produce sold at CEASA Fresh Food Markets in Pará come from other states. La This wholesale Supply Center is the main location for purchasing fruits, vegetables, and farm produce in the metropolitan region of Belém and it supplies street markets and retailers.

Source: INSTITUTO ESCOLHAS, 2022.

**2023**

### State Law No. 6.470:

restricts the supply of processed meats, canned foods and artificial beverages in the composition of Cardápio da Alimentação Escolar (School Meal Menus) of the public education system in Amazonas State.

### Decree No. 11.815:

Introduces the Programa Nacional de Conversão de Pastagens Degradadas em Sistemas de Produção Agropecuários e Florestais Sustentáveis (National Program for the Conversion of Degraded Pastures into Sustainable Agricultural and Forestry Production Systems); it aims to obtain additional funds to enable the conversion of degraded pastures into more sustainable systems, such as agroforestry systems.

### Decree No. 11.822:

the Programa Alimenta Cidades (Nourishing Cities Program) establishes a national strategy for food and nutrition security in government cities.

**2024**

### Ordinance No. 966 of the The Ministry of Social Development and Fight Against Hunger (MDS):

establishes a list of foods that can be included in the new national basic food basket, adding fish products and banning ultra-processed foods.

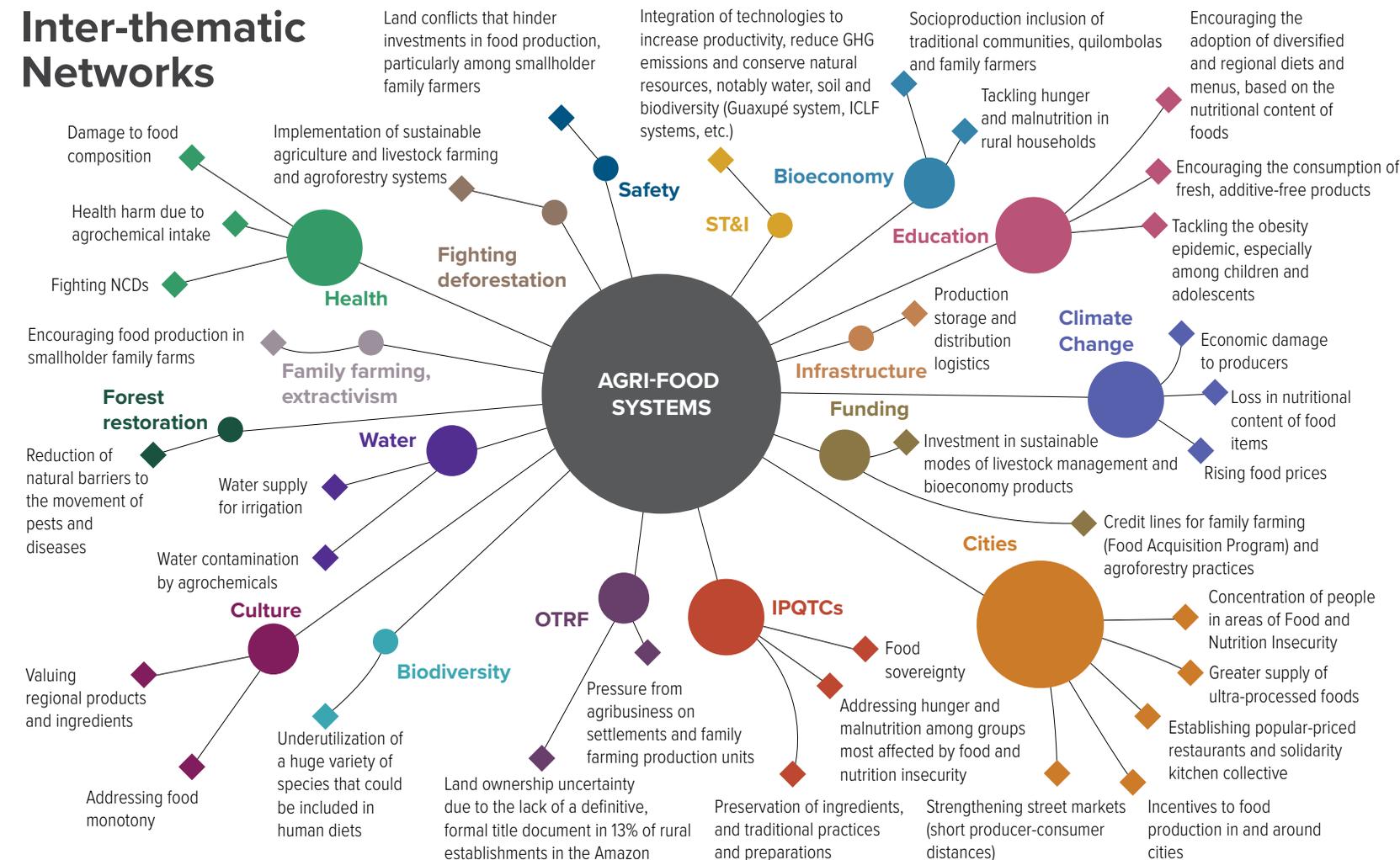
### Decree No. 11.937:

the Programa Cozinha Solidária (Solidarity Kitchen Program) establishes a social technology to combat food and nutrition insecurity; it was incorporated by the Federal Government to provide free, quality food to vulnerable populations, including homeless people.

### Decree No. 12.087:

the Programa Florestas Produtivas (Productive Forests Program) was created to promote productive restoration processes in rural family farming establishments and territories of traditional peoples and communities in the six Brazilian biomes.

## Inter-thematic Networks



# Expanding Connections: an Integrated Look at the Amazon Development Agenda

Based on the integrated agenda, the Amazon Concertation initiative expands the analysis initiated in its 2023 publication – “*Proposals for the Amazônia: an integrated approach*”, by adding six new structuring themes to the Amazon development agenda. In doing so, it expands the relationships of the network presented last year and unveils even more connections and interdependencies among peoples, sectors and the Legal Amazon region.

The themes deemed structuring are those capable of mobilizing public debate at subnational, national, regional and international levels. They are characterized by the potential to overlap with other themes, generating trade-offs, as well as to leverage one another, promoting synergies and, in principle, faster advancements in local development.

In 2023, six structuring themes were considered: Bioeconomy; Science, Technology & Innovation (ST&I); Education; Indigenous Peoples, Quilombolas and Traditional Communities; Health; and Security. Now in 2024, six new themes were added to the

analysis: Biodiversity, Cities, Culture, Energy, Territorial Planning and Land Regularization, (OTRF) and Agri-food Systems.

## The 12 Themes: Connections and Centralities

The relationships among the 12 structuring themes encompass environmental, social and economic issues, in line with the contemporary notion of development, which is multidimensional. The theme Indigenous Peoples, Quilombolas and Traditional Communities (IPQTCs), for instance, is connected with the theme Biodiversity in the environmental dimension when it comes to natural resource management, related traditional knowledges, and sharing of benefits. Concomitantly, it interconnects with the theme of Education in the social dimension as concerns combating prejudice and discrimination, respecting different cultures, and the protection of ethnic groups. And, in the economic dimension, it connects with the theme Bioeconomy when opportunities for socio-productive inclusion of these groups in the formal market are discussed.

The other structuring themes are also interrelated and uncover the strong correlation of the social, economic and environmental tripod. The theme Cities is related to the theme Agri-food Systems concerning the flow of income and goods for urban supply, but also concerning environmental and social dimensions, when discussing, for example, the importance of creating urban gardens and their role in the integration of green infrastructure into urban spaces, in promoting quality of life, well-being and diversified diets, and in the provision of pedagogical spaces for work and coexistence.

In exploring the interactions among structuring themes, a comprehensive view of how they interrelate is presented, also revealing links of interdependence – when two or more themes depend on one another to function or achieve their objectives. That interdependence has significant implications for the balance of development agendas at different administrative levels.

When there is interdependence between or among themes, none of them can thrive in isolation. The success of one directly depends on the balance of the others. In addition, understanding these relationships among structuring themes can facilitate working towards solutions that are more suitable to Amazonian contexts.

An emblematic example of this situation is the extreme drought in Amazonas State in September 2024, which concurrently involves issues of Infrastructure, Health, Culture, Agri-food Systems, Security, Cities, Bioeconomy and Education. Therefore, no strategic action plans to mitigate or promote adaptation to these extreme

events can disregard initiatives that encompass concerted actions in all these sectors.

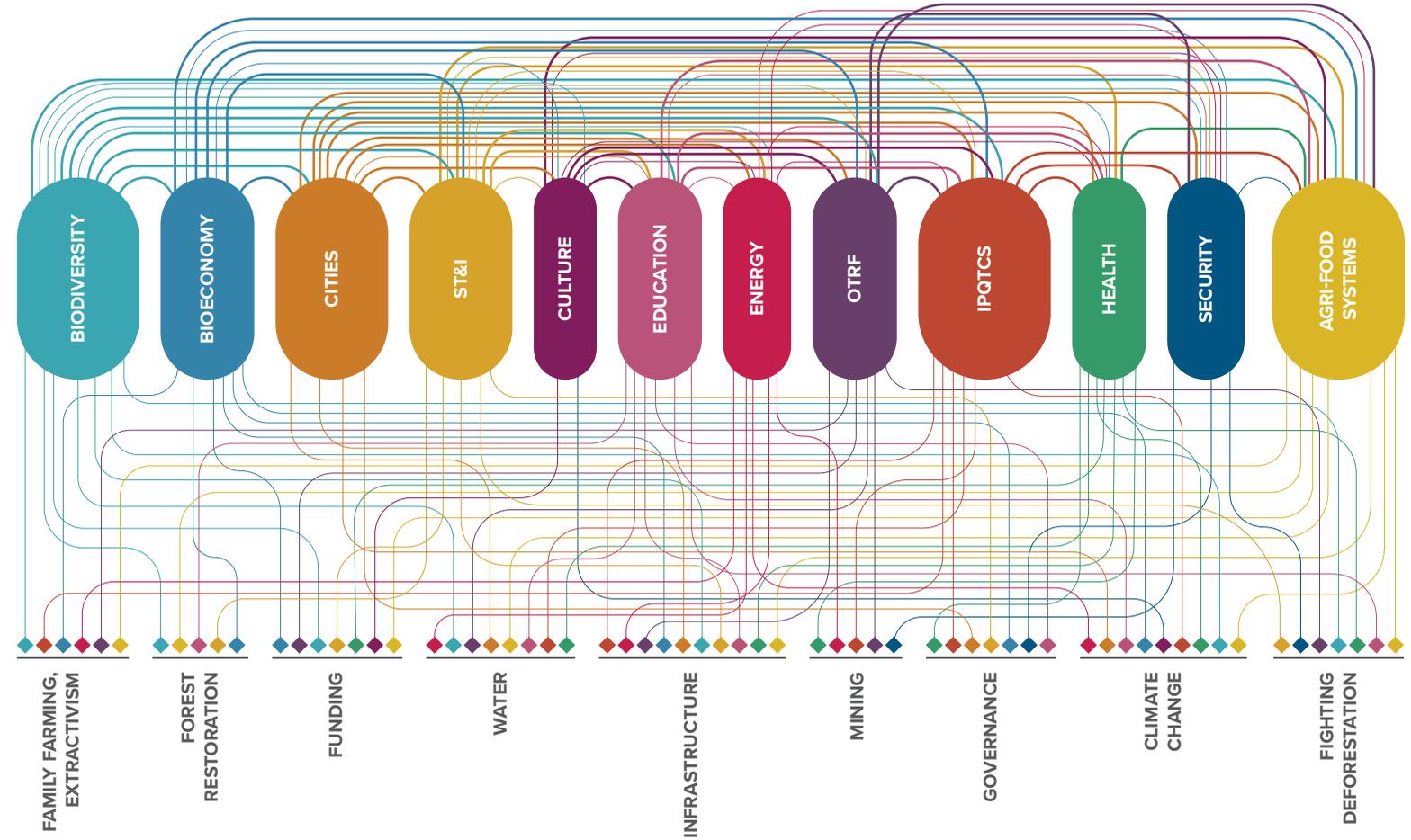
In the present publication, the Amazon Concertation once again adopts two complementary perspectives to analyze the connections among themes: a perspective from one of the structuring themes and another perspective looking at the general network as a whole. The first addresses the viewpoint of one theme vis-à-vis the others and the related themes in the Amazon development agenda – this is what we call inter-thematic networks. The perspective of the general network as a whole, in turn, addresses the relationships among structuring themes and related themes, providing a comprehensive view of these interactions and resulting in the general network.

The identification of the connections from a given structuring theme is presented in the inter-thematic network at the end of each chapter. The integrated view of the Amazon development agenda represented in the general network marks the midpoint of the present publication and the relationships among structuring themes from 2023 and 2024. This overall perspective shows the connections among the 12 structuring themes and related themes addressed by the Concertation, highlighting the dynamic nature of the agenda under analysis.

With the addition and integration of other structuring and related themes in 2024, the six inter-thematic networks presented in 2023 were also changed and adjusted, with added or removed

# Connections and Centralities Among Themes

● Structuring Themes — Unidirectional Connection  
 ◆ Related Themes — Bidirectional Connection



connections. These changes can be seen in the second part of this publication, where the respective adjusted inter-thematic networks are presented, as well as the corresponding artworks developed for the structuring themes of 2023.

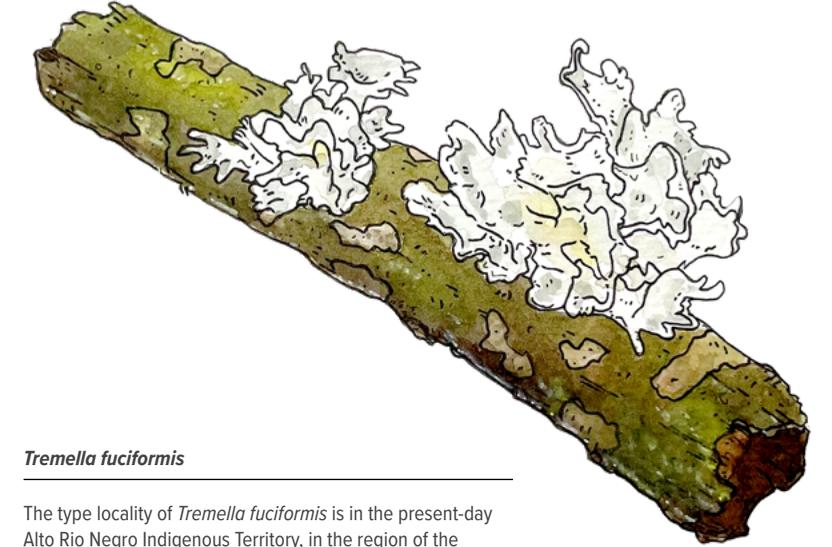
### General Network Diagram

As a result of the introduction of six new structuring themes to the integrated analysis, the general network diagram represents a significantly higher number of connections when compared to the general network in the 2023 publication.

In the present 2024 publication, the connections are based on evidence systematized by experts and on perceptions arising from listening sessions across the territory. For this reason, they carry some degree of subjectivity and a natural limitation with regard to potential connections that may not be expressed in the diagram.

In the representation of the general network, the larger the size of the node of a structuring theme, the higher the number of connections it has with other themes. Thus, the themes Indigenous Peoples, Quilombolas and Traditional Communities (IPQTCs), Agri-food Systems and Biodiversity are the ones with the most connections with the others, also having greater centrality in the general network. This means that they have more potential to leverage initiatives connected with the Amazon development agenda.

Expanding Connections:



*Tremella fuciformis*

The type locality of *Tremella fuciformis* is in the present-day Alto Rio Negro Indigenous Territory, in the region of the Ipanoré (Panuré) waterfall and/or community, on the Uaupés River. Samples collected by British naturalist Richard Spruce between September 7, 1852 and March 8, 1853, were studied by British mycologist Miles Joseph Berkeley, and in 1856 it was published as a new species (Berkeley 1856). There have been no changes to the scientific name and samples are stored in the Herbarium at the Royal Botanic Gardens Kew. Consumption of *T. fuciformis* is reported among the Kichwa people of Ecuador (Gamboa-Trujillo et al. 2019). This white, gelatinous mushroom known as “snow ear”, “white cloud ear”, among other names, is considered both medicinal and edible in Asian countries (Thawthong et al. 2014). In China, it is widely consumed in desserts and ice cream and is cultivated on a large scale.

It is worth noting that the IPQTC theme has stronger connections with the other structuring themes, with most connections being bidirectional. Considering that the IPQTC agenda in the Amazônia is marked by heterogeneity and consequent difficulty in dealing with specificities, the analysis indicates that any positive results of actions geared to this political agenda may spread with greater capillarity, bringing side benefits for the development of the territory as a whole. In addition, initiatives directed to other themes but also taking into account the needs of IPQTCs will be more effective.

Seven other structuring themes enjoy considerable centrality as well, namely: Agri-food Systems; Cities; ST&I; Bioeconomy; OTRF; Education; and Health. They represent, therefore, many other potential paths for structuring programs, projects and initiatives, with special attention to the participation of public-sector players in the last three themes (OTRF, Education and Health), as they are traditionally under government control.

### Related Themes

Among the nine related themes that emerge from this analysis, three may become part of the set of structuring themes in the near future, given the number of connections established with structuring themes: Infrastructure, Climate Change and Water. Topics such as mobility and logistics infrastructure, access to wa-

ter resources, drinking water and sanitation, as well as environmental preservation and climate change adaptation in rural and urban contexts, are all directly linked to scenarios of population growth and rising population density in cities, lack of security for traditional communities in the territory, agri-food production systems, and strengthening of the bioeconomy.

Three other related themes also deserve attention, given their cross-sectional importance in terms of the number of interconnections: Fighting Deforestation, Funding and Governance. Whereas Fighting Deforestation requires comprehensive short-term solutions led by the government through regulations and oversight, Funding and Governance models may involve experimentation with innovative institutional arrangements from the outset, with greater participation of civil society and the private sector. Both represent ways of facing the challenges of sustainable development in terms of mobilizing resources – economic, in one case, or political, in the other.

### Inter-thematic Networks

Similarly to the analysis carried out in 2023, each thematic section preceding and following the presentation of the general network shows inter-thematic networks that contextualize the connections based on each of the 12 structuring themes in the Legal Amazon.

These inter-thematic networks were developed with the collaboration of specific knowledge curators, led by experts in their respective areas, and resulting in scenarios of interaction among themes.

The connection of each of the structuring themes with the other themes of the Amazon development agenda is guided by the identification and prioritization of relationships that are supported by data and perceptions. Thus, the qualification of the relationships among themes is more than an exercise in possible elective affinities: these are tangible relationships that are effectively active, which can be strengthened or decoupled as the actual dynamics impose themselves or are reconfigured.

By way of illustration, Agri-food Systems are related with IPQTCs in issues of food sovereignty, of addressing food and nutrition insecurity and preserving ingredients, and of safeguarding traditional practices. This perspective, which is based on data and on the perceptions of people in the territory, also made it possible to identify relationships that, at first glance, might have gone unnoticed.

This is the case, for instance, of the relationships between Culture and Security; the existence of cultural programs and activities centered around reference hubs, such as traditional Pontos de Cultura (Cultural Points, financed and supported by the Ministry of Culture), constitute positive occupational insertion alternatives for youth to socialize, steering them away from illegal activities. Or the relationship between Culture and Health, in which cultur-

al production and consumption (literature, dance, painting, and drama) are regarded as sources of quality of life, well-being and longevity, in consonance with current development guidelines.

Both the general network and the inter-thematic networks are, therefore, a repository of data, perceptions, ideas, questions and proposed solutions in favor of an integrated agenda for Amazonian development.

### Starting Points

The proposed methodology and the analytical exercise of conducting an analysis of the general network and inter-thematic networks do not seek to strictly prioritize the themes, but rather to unveil connections that are not always obvious, and hence contribute to operationalizing the integrated approach in development agendas marked by complexity. Considering that in complex contexts there are no simple solutions, our proposal is to identify potential starting points for operationalizing that integrated development agenda.

In this sense, the result of interactions among structuring and related themes presented in the general and inter-thematic networks is not an end in itself, nor is it static. It should be treated as a dynamic and sensitive proposal to support the identification and formulation of cooperative institutional arrangements that are more in consonance with the demands of the territories and their inhabitants, as well as with the desired ambitions for the region as a whole.

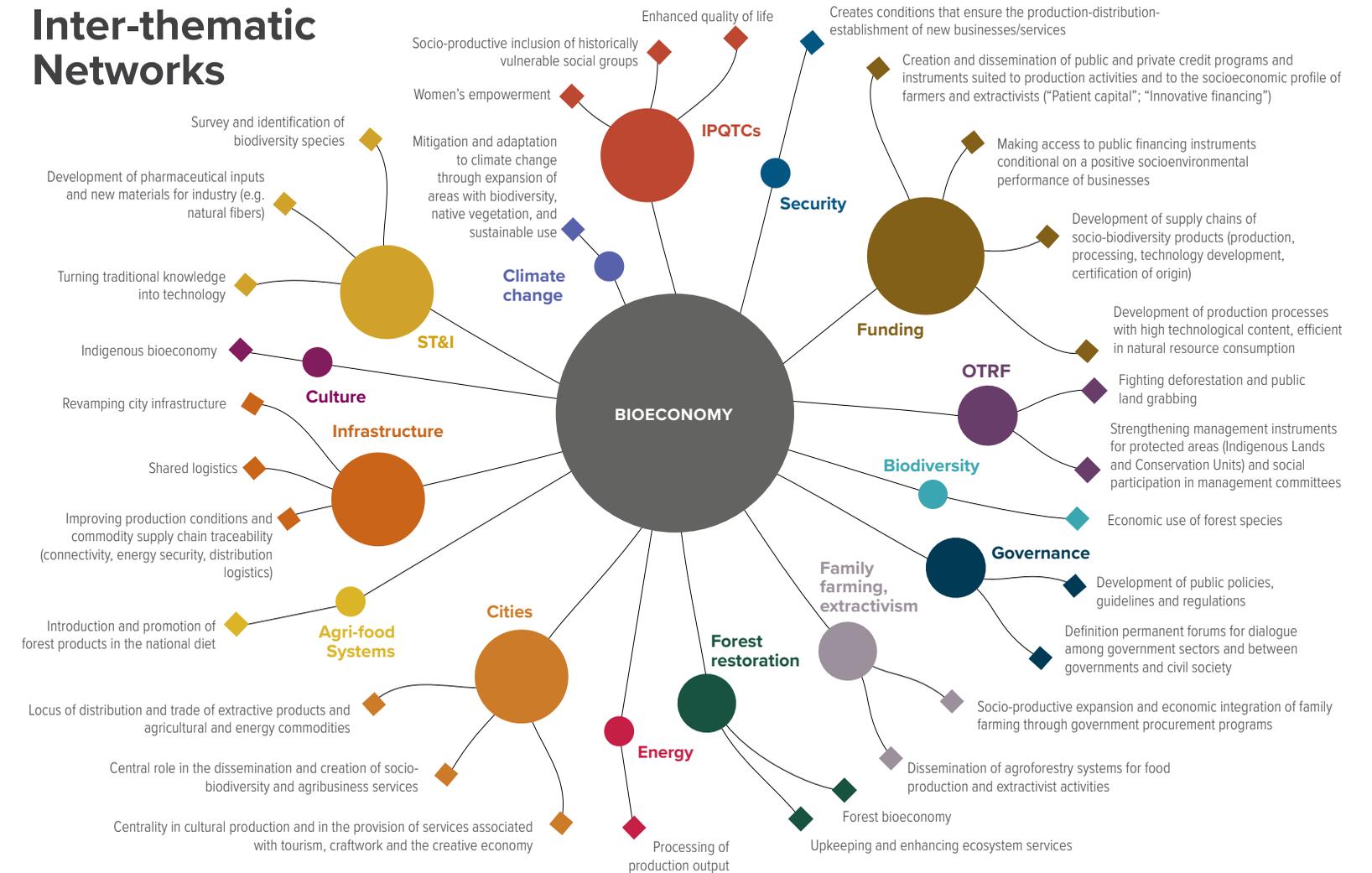
# Bioeconomy



**Teia da Vida, 2024**  
**Web of Life**  
 Silvana Mendes

“A work of art built from a process involving something close to my reality”, remarks the artist. A work about people, about weft, about circularity, a work about bioeconomy. Digital with a real fabric produced using several layers, just like in the territory, where, to have the landscape as it is today, several layers were worked on over a certain period of time. The warp and woof in the background shows the relationship between people and the territory, the sunlight illuminates the mask that is facing it, and, as it mirrors all, there is this other side, which is darkened. A conversational relationship, the original peoples have this relationship with nature, as do the quilombola peoples. It is illuminated in the relationship that these peoples have with the territory, with nature, their protection, worship, the (bio)economy, but it is also obscurity, because these peoples are in a situation of constant violence.

**Inter-thematic Networks**



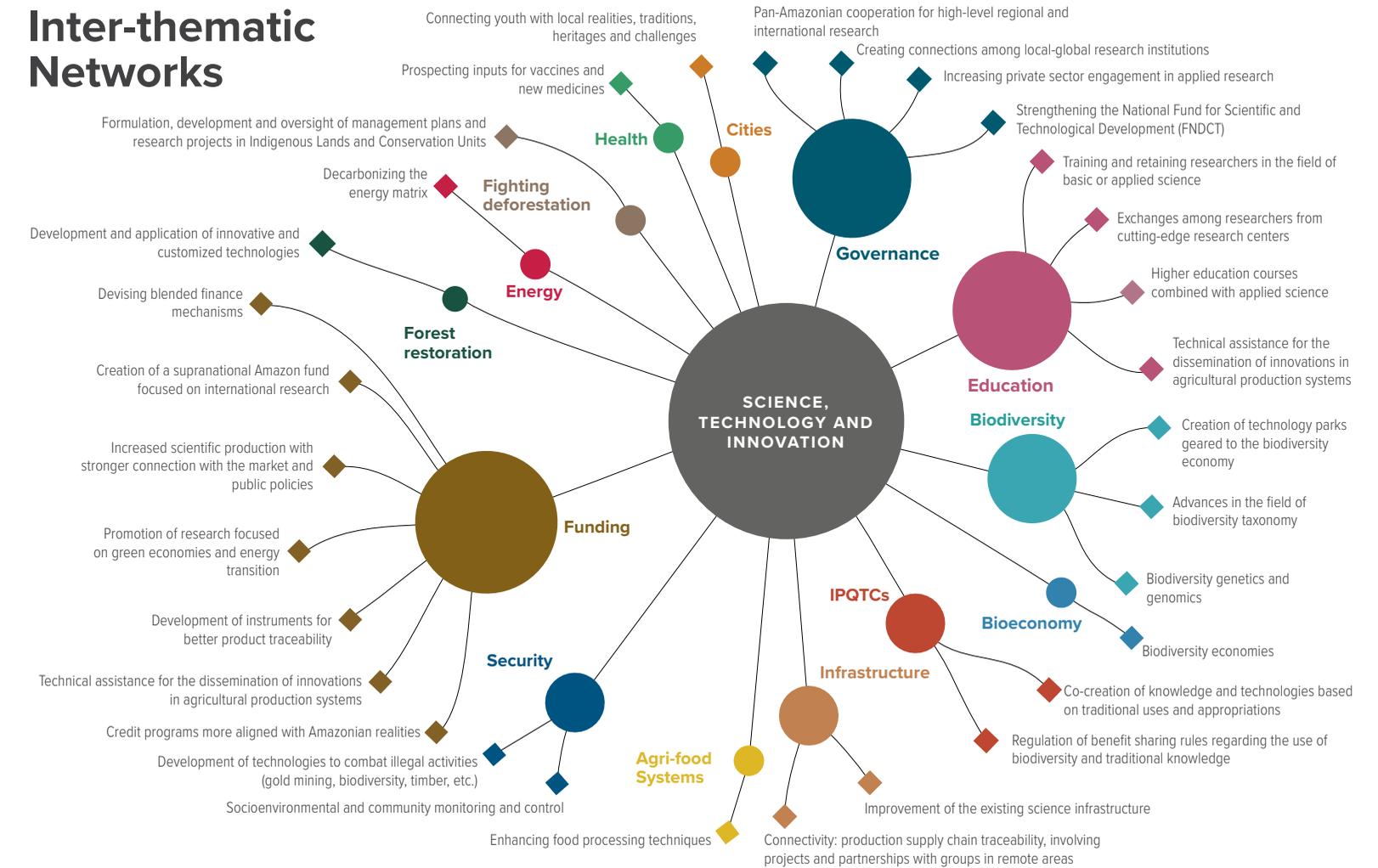
# Science, Technology and Innovation



***Xapiri Ancestral - plantação e colheita de novos mundos, 2024***  
***Ancestral Xapiri - planting and harvesting new worlds***  
 Rakel Caminha

Ancestral Xapiri - Planting and Harvesting New Worlds is a way of saying that this planet is being transformed, the planet is in the hands of this transformation and it needs to go through it. The light bulb illuminates and brings new ideas produced by hands that plant, from people who plant a new reality, a new tomorrow. A tomorrow concocted by many hands and by the forest, hands that keep the forest standing and all this together with the protective spirits. Overlapping scientific and traditional times and knowledge that need to come together for that tomorrow. Xapiri is a dialogue precisely about this. Along with some symbols, such as mushrooms, here representing the roots of our land. It - the Xapiri - needs roots, and at the same time it floats. This art talks about connection, about the planet being in the hands of this change. And the change is under way. It is in the hands of many hands, many fronts that need to coexist and plant together so that new realities may sprout.

**Inter-thematic Networks**



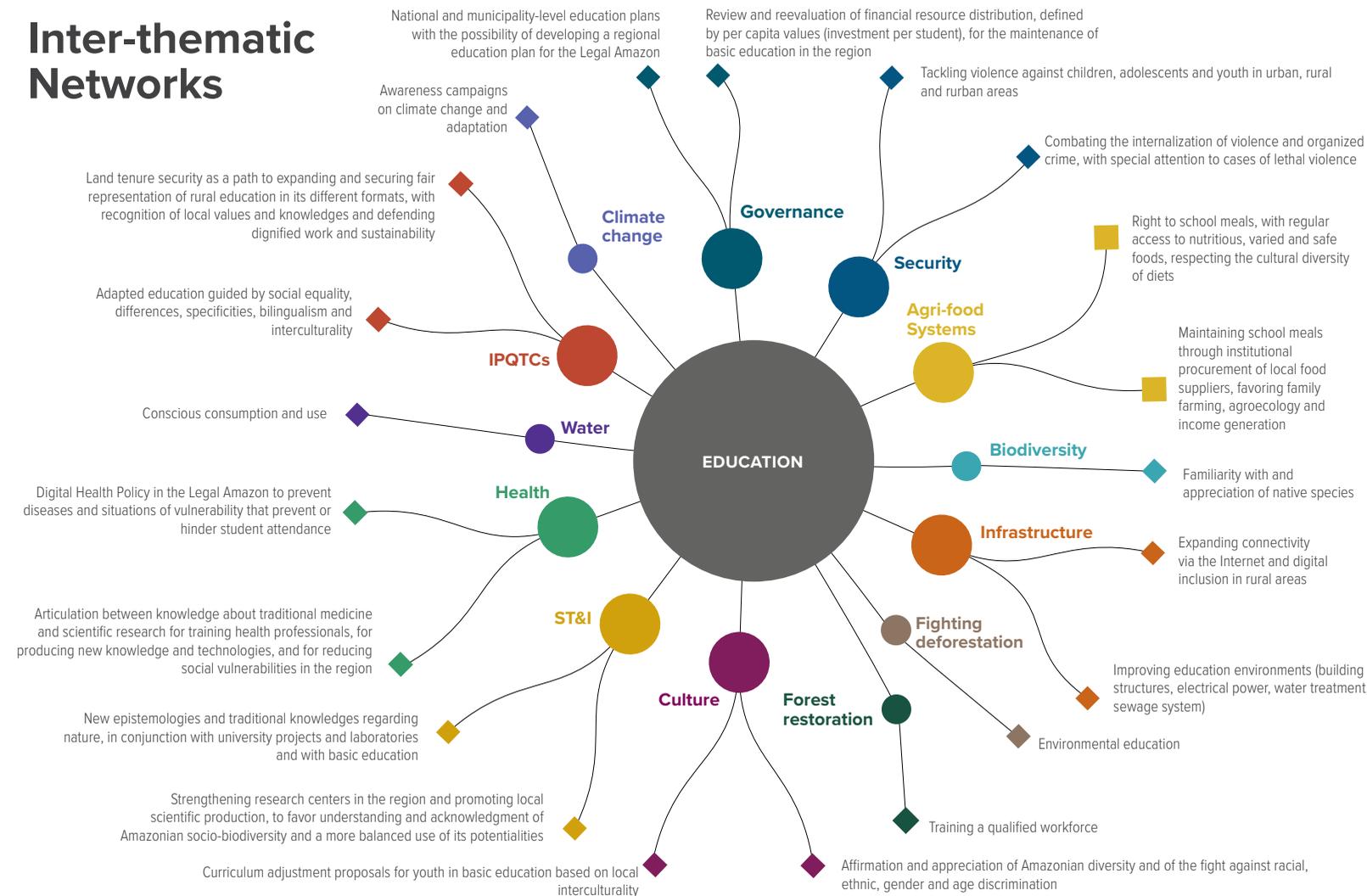
# Education



**Presentismo Amazônico, tudo está aqui, 2024**  
**Amazonian Presentisms, Everything is Here**  
 Kerolayne Kemblin (DaCorDoBarro)

An overlapping of times, spaces and people. “The river, the city, the boats, the Internet, the street, a small corner store with cooking oil on a shelf, flour, things that take me back to my childhood, when my mother would send me to the bodega to buy food, and, for me, all of that was a learning experience, it was education in its broadest sense”, states the artist. The change, the getting the change, knowing the way, this relationship with the territory which is built from a very early age for some, all of this is education. The past with childhood memories is blended with the future in the image of other children, of different people. “All of this, connected to things that I have experienced and that I have not experienced alone”. It’s built from the inside in. For those who have had this experience, to identify with it, and for those who haven’t, to learn about it. This work presents the Amazon as a place for educating. Education is present in everything. The memories of the things we learn in early childhood, being in touch with nature, thinking of nature as the great mother, the grand school that educates. Everything has a meaning in Amazonian life, everything has a foundation. Everything educates.

**Inter-thematic Networks**



# Traditional Peoples and Communities





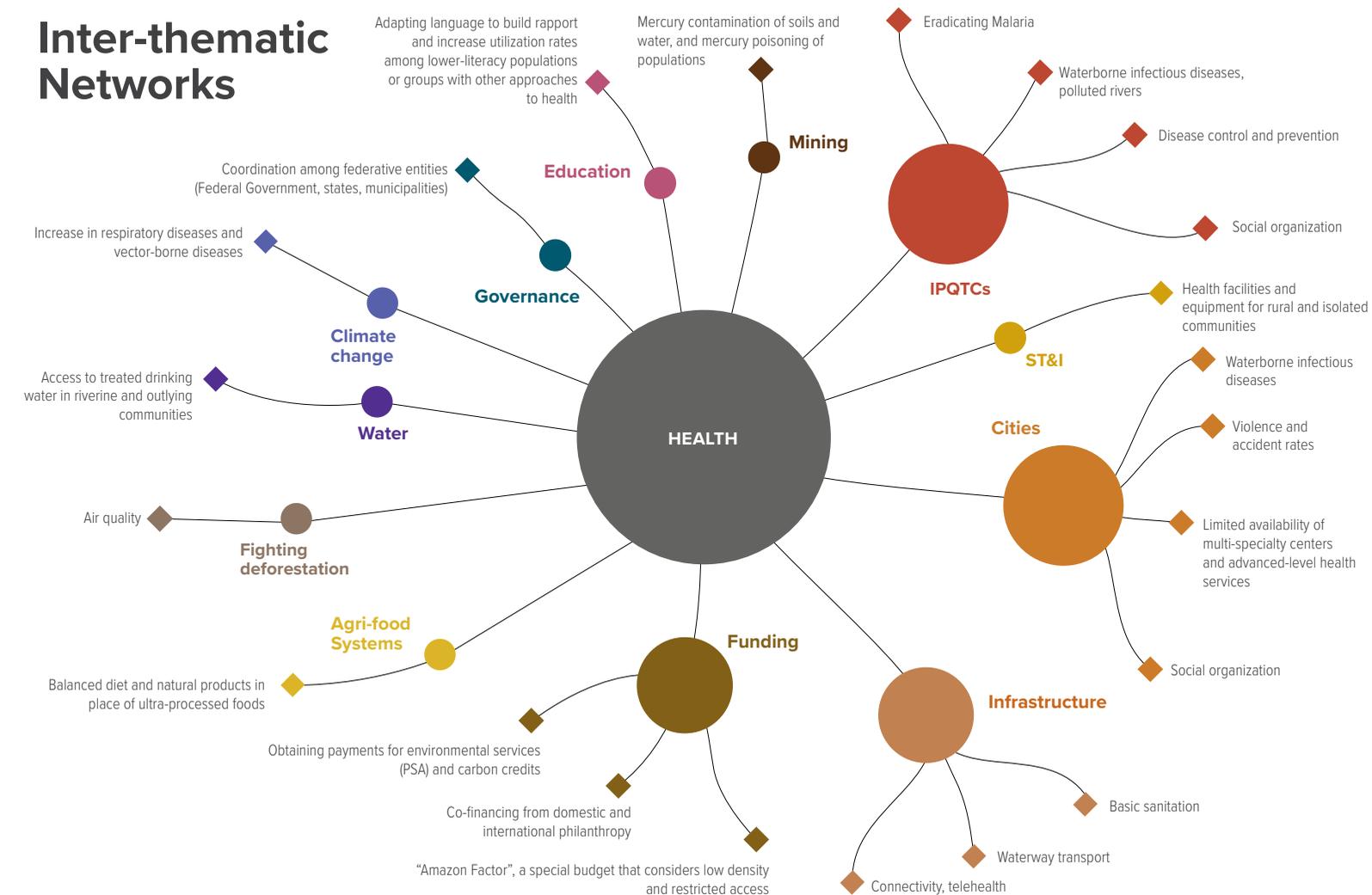
# Health



**Nossa saúde está nas águas, 2024**  
**Our Health is in the Waters**  
 Bonikta

This art is about access, about the importance of access to public health. It is about well-being. In the center, a drawing of a community health agent, a nurse of Marajoara heritage with indigenous features; in the background, a division between the city and this maze of stilt houses. The urban and the riverine. The movement of water between the city and the inland areas, the islands, this flow of water, all of this is part of our culture. Rivers must be clean, we need access to water to have access to health.

**Inter-thematic Networks**



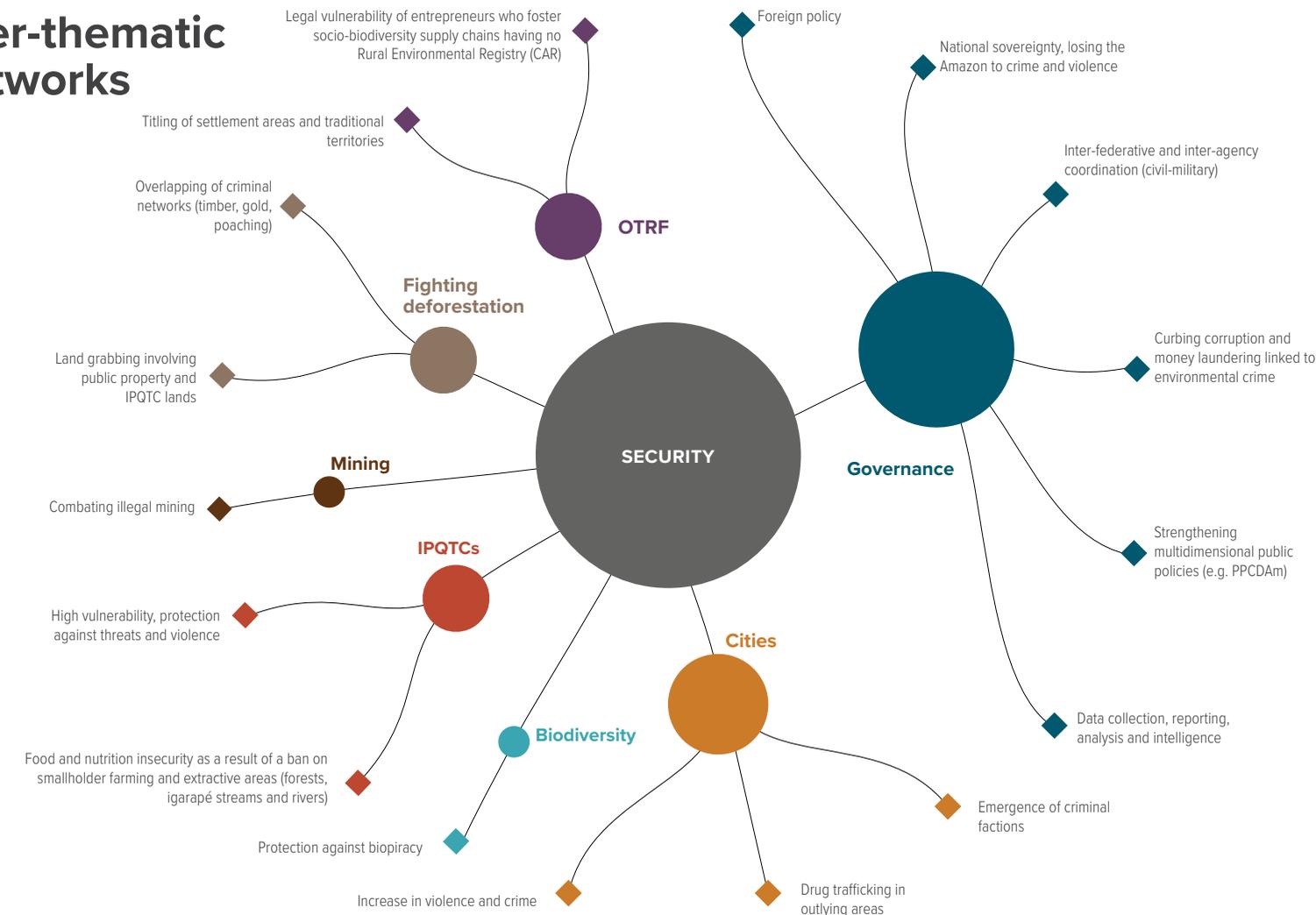
# Security



## MO'Ã, 2024 Gê Viana

I didn't want to create a work of art that spoke of security from a biased perspective of violence, something about security from the territory, which is why this work addresses the issue of food, of nourishment. Nourishment is important; if we don't eat, we can't survive, regardless of security in the territory. This Amazon which we think is the Amazon but which also extends beyond Brazil's borders, as the map shows, needs several types of security, needs some balance, like the characters floating in the canoe, recalling the flying rivers of the Amazon. Rivers bursting with abundance that, together with the moon, govern part of the food cycle and also some rituals.

## Inter-thematic Networks





## Starting Points, Dialogue and Tangible Actions

In the four years since its inception, and now with nearly 800 participants, the Amazon Concertation network has already amassed a wealth of insights and learnings, foremost among them recognizing the importance of connecting the dots among key themes for the development of the region and seeking convergences based on these relationships.

Based on an agenda of consent and of seeking convergence among widely diverse views, the Concertation embraces plurality and combats the fragmentation of agendas through an integrated view of the themes, with the firm belief that only through this approach will it be possible to address the complexity of the Amazônias, protect biodiversity and the climate, and promote well-being for people, with income generation and prosperity.

The Concertation affords a space for inclusion and conciliation of differences, in which context and diversity of opinions are

valued. It does not seek to play a homogenizing role, and this sets it apart from similar initiatives. On the contrary, it encourages in-depth exchanges among various points of view and, in doing so, promotes a high-quality forum, worthy of the complexity of the Amazônias.

On top of the inherent challenges posed by the region, over the past four years of the Concertation's operations the overall context has been marked by political setbacks in the country's socioenvironmental agenda, followed by increasingly frequent extreme climate events. Frequent heat waves and historic droughts are bringing the Amazon Rainforest dangerously close to a point of no return, from which the humid tropical forest could give way to a savannah, with profound implications for society at large.

Fundamental for climate balance in the country and the world, the Amazônias provide perennial, temporary and "flying" rivers

that - within the region as well as in the rest of Brazil - make it possible for peoples and communities to remain in the forest and enable agribusiness productivity, energy generation and waterway transport – but these regions are feeling the dramatic impacts of global warming and ecosystem degradation. The greatest challenge is, therefore, to keep preserving the forests and to restore deforested and degraded areas, reestablishing the environmental conditions that make the Amazônias such a unique and necessary region to guarantee a safe space for humanity on the planet.

This is an objective that will not be achieved with specific or unilateral action, but with a concerted effort of the most diverse players and sectors, including governments, civil society, the private sector, academia and above all of local populations, committed to and united around common goals.

In this endeavor, science, art and culture must work together, as they broaden perspectives, sharpen sensitivity and mobilize people, enhancing the impacts of structuring initiatives and drawing up increasingly convergent and structuring political agendas.

The convergence of key themes for Amazonian development had already been the subject of *An Integrated Agenda*, published by the Concertation in 2021. From then on, the network has evolved in terms of the ways it operates in the territories, re(cognizing) regional diversities, acknowledging them as essential to initiatives aimed at strengthening institutional

capacities. In 2022, this understanding led the Concertation to publish *The first 100 days of the government: Proposals for an integrated agenda for the Amazônias*, a document that structured normative acts to support government administrations elected for the 2023-2026 term.

The third document prepared by the Concertation, released in 2023, deepened the connection among structuring themes, using the image and notion of fungal networks to represent the interconnections among issues, sectors, people, ideas and actions, in a strong and elaborate network that serves as a substrate for development to flourish.

This year, the Concertation presents an even more comprehensive view of the integrated agenda, encompassing 12 key structuring themes. This exercise is not the endpoint, but rather a launching point for identifying, implementing and disseminating cooperative institutional arrangements that are increasingly in consonance with the demands of the territory and the desired ambitions for the region as a whole.

The Amazon Concertation confirms its role as a space for dialogue, always seeking to qualify the debate and bring tangible contributions through structuring initiatives that embrace local cultures and knowledges, and with the engagement of youth, dedicated to building and shaping the future of the Amazônias starting now.

## Acknowledgments

The Amazon Concertation would like to thank all members of the network, the thematic experts, peoples from the territories and artists who, directly or indirectly, brought their contributions to this publication. We reaffirm our commitment to being a democratic space for dialogue, exchange and integration of knowledges. The proposals here presented do not necessarily represent a consensus among participants and should not be individually attributed to any member or their institutions.

### *Oudemansiella platensis*

*Oudemansiella platensis* (Speg.) Speg. is the first species of this genus described in 1880 by Italian-Argentine mycologist Carlos Luis Spegazzini. The name of the genus was a tribute to botany professor Dr. C. Oudemans, for his contributions in the fields of botany and mycology in the Netherlands. The epithet “platensis” is in honor of the Rio de la Plata, due to the original collection made by Spegazzini himself, carried out near this river in Argentina (Spegazzini, 1881). In 1838, Franciscus Junghuhnio described the species *Agaricus canarii* from the island of Java, Indonesia, found on living branches of *Canarium communis* L. In 1909, the species was recombined as *Oudemansiella canarii*. In 2008, in an extensive survey led by the American mycologist Ronald H. Petersen, a neotype was defined for *O. canarii* (Java) and an epitype for *O. platensis* (Argentina). *O. canarii* is often cited as an edible mushroom species, we believe that the literature reporting *O. canarii* for the Amazon actually refers to *O. platensis*.



# Notes

## BIODIVERSIDAD

1. Unique vegetation patches in the Amazonian biome, characterized by white-sand, nutrient-poor soils subject to periodic flooding and fluctuating groundwater levels
2. <https://vitascientiaweb.wordpress.com/wp-content/uploads/2023/07/assad-vazoller-2023-biodiversidade-e-bioeconomia-1.pdf>

## CITIES

1. Regarding the interpretive approaches found in the works of Alberto Rangel and Euclides da Cunha, the former portrays the city as “a terrible place” and the latter as “paradisiacal”. For further information on the subject, see Queiroz (2017).
2. The Areas of Influence of Cities (REGIC) survey - the most recent version of which was conducted by the Brazilian Institute of Geography and Statistics (IBGE) in 2018 - details the Brazilian urban network, establishing a hierarchy of urban centers in five levels: Metropolises, Regional Capitals, Sub-Regional Centers, Zone Centers and Local Centers. It delimits their

respective areas of influence and the types of connection between smaller towns and these urban centers.

3. The author proposes the concept of “extended periurban” to describe the hinterland of non-urbanized settlements that, in the context of the Amazon, are strongly integrated with a town.
4. In her work, Machado (1993, p. 7) refers specifically to the case of “settlements spread throughout the Amazon region that, without taking on the form of a city, constitute a type of rural/urban ‘network’ that expresses more clearly this process of instability and the situation of uncertainty and precariousness to which their inhabitants are subject, when compared to what happens in formal urban networks (Machado, 1993, p. 422)”.
5. The Border Strip, first established in 1979 through Law No. 6,634, is defined in article 20 of the Federal Constitution as “the strip of land measuring up to one hundred and fifty kilometers wide, along the land borders” (BRASIL, 1988).

## CULTURE

1. Inauguration speech as Minister of Culture, delivered on January 2, 2023 at the National Museum of the Republic in Brasília.
2. “Riverine peoples live close to riverbanks, and they earn their livelihood from hunting, fishing and plant extractivism. The management of floodplain areas, and related production techniques and social organization are a body of knowledge inherited from the indigenous people who lived in these areas in pre-colonial times” (Fernandes; Moser, 2021, p. 533). Some of the techniques used and improved include the bow and arrow, spear and harpoon (rod) fishing, and gillnetting.
3. *Beiradeiros* (riverbank dwellers) is a term used by this group in their self-identification, and it refers to people who live on the banks of rivers.
4. *Piaçabeiros* (piassava palm harvesters) earn their livelihood from extracting fiber from the piassava (from the Tupi “fibrous plant”) palm, used in the manufacture of brooms, and it is one of the major economic activities of the

populations that inhabit the Middle and Upper Rio Negro and its tributaries, in the state of Amazonas.

5. *Peconheiros* (açai berry pickers) are açai extractors, who risk their lives at the top of açai palm trees and struggle for the regulation of their activity, seeking better work conditions..
6. The cosmologies of indigenous populations involve complex models that express their conceptions about the origin of the Universe and all existing things. Myths, in turn, when considered separately, describe aspects such as the origin of human beings, the ecological relationships among humans, animals, plants and other elements of nature, as well as the reasons behind certain culturally important social relationships.

## ENERGY

1. As stated by Violeta Refkalefsky Loureiro in her 2002 article “Amazônia: uma história de perdas e danos, um futuro a (re)construir” (Amazon: a history of loss and damage, a future to (re)build).
2. According to PRDA 2016-2019, page

65. In: Superintendence for the Development of the Amazon Plano Regional de Desenvolvimento da Amazônia - PRDA (Amazon Regional Development Plan): 2016-2019. Belém: SUDAM, 2016. 151p.

3. These figures for mineral reserves in the Amazon region are still incomplete, as according to the Geological Survey of Brazil, only 37% of the region has been mapped.
4. Although planners do not think about energy services, but about energy supply. When we talk about energy services, we consider end-use energy technologies, we talk about energy demand not as a given, but as a set of technologies that are more or less efficient, more or less polluting, more or less expensive, and consumption habits that shape demand, in such a way that it can, and should, be changed. Integrated resource planning involves the articulation of needs on the demand side and of solutions on the supply side).
5. PRDA 2012-2015, PRDA 2016-2019, PRDA 2020-2023. The current PRDA 2024-2027 awaits processing

by Brazil’s Congress. That bill (PL 5787/2023) was submitted to the House of Representatives on 11/29/2023 and awaits the President of the House’s decision to proceed with the processing.

6. [Decree No. 11.648 of August 16, 2023](#).
7. On 4 June 2024 a [Public Consultation](#) was posted, and closed only fifteen days later, to collect contributions from society to the Guidelines Ordinance for carrying out the 2024 Isolated Systems Auction, as a tender for electricity supply contracts to serve 15 Isolated Systems. Scheduled to take place in December 2024, the [auction proposes](#) a new feature: the determination that registered supply solutions must have a minimum share of 20% from renewable sources with or without energy storage, that is, the electricity generated cannot come 100% from fossil fuels but 80% at most, with the exception of natural gas. This exception granted to natural gas was justified by the Ministry of Mines and Energy arguing it is a “low carbon fuel”, with competitive costs

compared to that of diesel oil in the region, and because it is a solution that cannot be discarded when there are no available alternatives in a given location. The Ministry emphasized that the proposal is to prioritize solutions that include renewable sources.

8. SISOL and SIN emissions factors are 0.64 and 0.04 tCO<sub>2</sub>eq/MWh respectively.
9. Cf. [https://www.planalto.gov.br/ccivil\\_03/\\_ato2023-2026/2023/decreto/D11628.htm](https://www.planalto.gov.br/ccivil_03/_ato2023-2026/2023/decreto/D11628.htm)
10. Cf. [https://www.trsolucoes.com/conteudo/articles/ccc\\_com\\_menos\\_diesel\\_e\\_mais\\_baterias\\_quais\\_serao\\_os\\_efeitos\\_para\\_o\\_consumidor](https://www.trsolucoes.com/conteudo/articles/ccc_com_menos_diesel_e_mais_baterias_quais_serao_os_efeitos_para_o_consumidor).
11. [Decree No. 12.084, of June 28, 2024](#).

## TERRITORIAL PLANNING AND LAND REGULARIZATION

1. Unoccupied lands are public lands that have not formally been property of the State and are not owned by private entities.
2. Spatial planning mediates the demands for space by the State,

the market and the community, through three mechanisms: stakeholder engagement, integration of sectoral policies and promotion of development projects. These mechanisms define the three schools of spatial planning: formulation of transformative strategies, innovation activities and performance in spatial planning. Cf. Bafarasat, 2015.

3. More information on the topic can be found in chapter 6 of the book “Governança de Terras: da teoria à realidade brasileira” [Land Governance: from theory to Brazilian reality] (FAO/SEAD, 2017).
4. This involves the legalization of land ownership through a false document (fictitious aspect). It is also understood as the illegal appropriation of land through the expulsion of squatters and/or indigenous people. It means, therefore, a number of mechanisms of falsification of land ownership documents, fraudulent negotiations, blackmail and corruption that have involved Public Authorities and private entities (IPAM, 2006).
5. Discriminatory Actions are used to

# Acronyms

- divide and title public lands; Adverse Possession is an original form of acquiring the right of ownership over a property based on the use of that property for a certain period of time, continuously and undisputedly; and Judicial Expropriation is an administrative procedure by which the public authority, due to public need, public utility or social interest, imposes on the owner the loss of a property, replacing it with fair compensation.
- The Land Management System (SIGEF), created through Law No. 10,267/2001 and developed by INCRA and the then Ministry of Agrarian Development (MDA), currently Ministry of Agrarian Development and Family Farming, receives, organizes, regularizes and publishes georeferenced information about rural properties, and is also responsible for certifying these properties and their boundaries.
  - The Terra Legal Program (PTL) aims to massively regularize property titles for small occupations on federal public lands, of up to four fiscal modules, in the Legal Amazon. One of the positive aspects of the Terra Legal Program was the coordinated investment in technology to improve the processing, organization and analysis of land title regularization requests and the digitization of several processes that were previously done on paper. The Program, however, failed to include the participation of civil society, as originally provided for by law, in addition to having delivered fewer titles than initially planned. Of the 300 thousand titles planned, around 40 thousand were delivered by 2018 (cf. Imazon, 2022).
  - The Rural Environmental Registry (CAR), established by Law No. 12,651/2012, also known as the Forest Code, aims to organize, monitor and adapt rural properties to environmental legislation, and contains georeferenced information. Of mandatory nature, it is the electronic record of rural properties, carried out by the owner or possessor of the property, or by a legal representative, to which the title of ownership or document proving possession, plan, specifications or sketch of the property are attached (with perimeter delimitation, delimitation of Legal Reserve, Permanent Preservation Area, forest cover, areas of restricted use and consolidated areas, size in fiscal modules, among other characteristics).
  - The Animal Transit Form (GTA) is an official document for interstate or intradistrict transportation of animals for any purpose (fattening, slaughter, reproduction, auction, sport, etc.). It must be filled out by the veterinarian responsible for the animals and contains essential information about the traceability of the animals (origin, destination, purpose, species, vaccinations, among other details).
  - The National System of Territorial Information Management (SINTER) is a spatial database of the Federal Revenue Service that integrates legal, fiscal, geospatial and registry information on urban and rural properties.

- AMZL:** Brazilian Legal Amazon  
**ANM:** National Mining Agency  
**CAR:** Rural Environmental Registry  
**CITA:** Tapajós Arapiuns Indigenous Council  
**CNIR:** National Rural Property Registry  
**CRIA:** Reference Center for Environmental Information  
**DCNT/NCD:** Noncommunicable diseases  
**FAF:** Catalyst Land Fund  
**FAO:** United Nations Food and Agriculture Organization  
**FNDCT:** National Fund for Scientific and Technological Development  
**FNDE:** National Fund for the Development of Education  
**FUNAI:** National Foundation of Indigenous Peoples  
**GHG:** Greenhouse Gas  
**GT/WG:** Work Group  
**GTA:** Animal Transit Guide  
**IBGE:** Brazilian Institute of Geography and Statistics  
**ICMBio:** Chico Mendes Institute  
**iCS:** Institute for Climate and Society  
**IEI Brazil:** International Energy Initiative  
**IEMA:** Institute of Environmental Management and Assessment  
**IFSP:** Federal Institute of Education, Science and Technology

- IGT:** Land Governance Institute  
**INCRA:** National Institute for Colonization and Agrarian Reform  
**Insan:** Food and Nutrition Insecurity  
**IPAM:** Amazon Environmental Research Institute  
**Losan:** Organic Law on Food and Nutrition Security  
**MDA:** Ministry of Agrarian Development and Family Agriculture  
**MinC:** Ministry of Culture  
**MMA:** Ministry of Environment  
**PAA:** Food Acquisition Program  
**PIB/GDP:** Gross Domestic Product  
**PNAE:** National School Meal Program  
**PNAPO:** National Policy on Agroecology and Organic Production  
**PNMC:** National Policy on Climate Change  
**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  
**PTL:** Terra Legal Program  
**REGIC:** Areas of Influence of Cities  
**SGB:** Brazilian Geological Survey  
**SIGEF:** Land Management System  
**SIN:** National Interconnected System

- SINTER:** National Territorial Information Management System  
**SISAN:** National System on Food and Nutrition Security  
**SISOL:** Isolated Systems  
**SPU:** Secretariat of the Union's Heritage  
**SUDAM:** Superintendence for the Development of the Amazon  
**UEMA:** State University of Maranhão  
**UFPA:** Federal University of Pará  
**UFPR:** Federal University of Paraná  
**UnB:** University of Brasília  
**WWF Brazil:** World Wide Fund for Nature

# References

## BIODIVERSITY

ANTONELLI, A. et al. Amazonia is the primary source of neotropical biodiversity. **PNAS**, v. 115, n. 23, p. 6034-9, jun. 2018. Available at: <<https://www.pnas.org/doi/epdf/10.1073/pnas.1713819115>>. Accessed on: 19 Sep. 2024.

AZEVEDO-RAMOS, C.; GALATTI, U. Patterns of amphibian diversity in Brazilian Amazonia: Conservation implications. **Biological Conservation**, v. 103, n. 1, p. 103-11, Jan. 2002. Available at: <[https://doi.org/10.1016/S0006-3207\(01\)00129-X](https://doi.org/10.1016/S0006-3207(01)00129-X)>. Accessed on: 19 Sep. 2024.

BANHA, T. N. S. et al. The Great Amazon Barrier system: a fact. **Frontiers in Marine Science**, v. 9, art. 1088956, 2022. Available at: <<https://doi.org/10.3389/fmars.2022.1088956>>. Accessed on: 19 Sep. 2024.

CATÁLOGO TAXONÔMICO DA FAUNA DO BRASIL [Taxonomic Catalog of Brazilian fauna]. Real-time database. Available at: <<http://fauna.jbrj.gov.br/fauna/listaBrasil/ConsultaPublicaUC/ConsultaPublicaUC.do>>. Accessed on: 11 Sep. 2024.

CATALOGUE OF LIFE. Database updated monthly. Available at: <<https://www.catalogueoflife.org/>>. Accessed on: 9 Sep. 2024.

CONVENTION ON BIOLOGICAL DIVERSITY. Institutional: Brazil – Country Profile. Available at: <<https://www.cbd.int/countries/profile?country=br>>. Accessed on: 6 Sep. 2024.

COSTA, H. C.; GUEDES, T. B.; BÉRNILS, R. S. (2022) Lista de répteis do Brasil [List of reptiles of Brazil]. *Herpetologia Brasileira* [Brazilian Herpetology] 10: 110-279. Available at: <<https://sbherpetologia.org.br/lista-repteis-sbh-copy-copy>>. Accessed on: 19 Sep. 2024.

DAGOSTA, F. C. P.; PINNA, M. The fishes of the Amazon: distribution and biogeographical patterns, with a comprehensive list of species. **Bulletin of the American Museum of Natural History**, n. 431, p. 1-163, 2019. Available at: <<https://doi.org/10.1206/0003-0090.431.1>>. Accessed on: 19 Sep. 2024.

FERRANTE, L. et al. Effects of Amazonian flying rivers on frog biodiversity in the Atlantic Rainforest. **Conservation Biology**, v. 37, n. 3, e14033, 2023. Available at: <<https://doi.org/10.1111/cobi.14033>>. Accessed on: 19 Sep. 2024.

GARNETT, S. T. et al. A spatial overview of the global importance of Indigenous lands for conservation. **Natural Sustainability**, v. 1, p. 369-74, 2018. Available at: <<https://www.nature.com/articles/s41893-018-0100-6>>. Accessed on: 19 Sep. 2024.

INSTITUTO IGARAPÉ. **Governar para não entregar**: uma agenda de segurança multidimensional para a Amazônia brasileira [Governing to not surrender: a Multidimensional Security agenda for the Brazilian Amazon]. Instituto Igarapé: Rio de Janeiro, 2022. Available at: <<https://igarape.org.br/governar-para-nao-entregar-uma-agenda-de-seguranca-mul>

[tdimensional-para-a-amazonia-brasileira/](https://igarape.org.br/guia-para-o-enfrentamento-de-crimes-ambientais-licoes-do-combate-a-mineracao-ilegal-de-ouro-na-amazonia)>. Accessed on: 11 Sep. 2024.

INSTITUTO IGARAPÉ; INTERPOL. **Guia para o enfrentamento de crimes ambientais**: lições do combate à mineração ilegal de ouro na Amazônia [A Guidebook to combating environmental crimes: lessons from combating illegal gold mining in the Amazon]. Instituto Igarapé: Rio de Janeiro, 2021. Available at: <<https://igarape.org.br/guia-para-o-enfrentamento-de-crimes-ambientais-licoes-do-combate-a-mineracao-ilegal-de-ouro-na-amazonia>>. Accessed on: 9 Oct. 2024.

INTERGOVERNMENTAL SCIENCE-POLICY PLATFORM ON BIODIVERSITY AND ECOSYSTEM SERVICES (IPBES). **The global assessment report on biodiversity and ecosystem services**. Bonn: IPBES Secretariat, 2019. Available at: <[https://www.ipbes.net/system/files/2021-06/2020%20IPBES%20GLOBAL%20REPORT\(FIRST%20PART\)\\_V3\\_SINGLE.pdf](https://www.ipbes.net/system/files/2021-06/2020%20IPBES%20GLOBAL%20REPORT(FIRST%20PART)_V3_SINGLE.pdf)> Accessed on: 5 Sep. 2024.

LAPOLA, D. M. et al. The drivers and impacts of Amazon forest degradation. **Science**, v. 379, n. 6630, 2023. Available at: <<https://doi.org/10.1126/science.abp8622>>. Accessed on: 19 Sep. 2024.

MAPBIOMAS. **Amazônia** – Evolução anual da cobertura e uso da terra (1985-2022) [Amazon - annual assessment of land cover and land use (1985-2022)]. (Chart). São Paulo: MapBiomas, 2022. Available at: <<https://brasil.mapbiomas.org/wp-content/uploads/sites/4/2023/08/>

[MBI-Infografico-amazonia-8.0-BR-rev4-scaled.jpg](https://brasil.mapbiomas.org/estatisticas/)>. Accessed on: 10 Sep. 2024.

MAPBIOMAS. Cobertura e transições por terra indígena – Dados de área (ha) de cobertura e uso da terra por terra indígena de 1985 a 2023 [Coverage and transitions by indigenous land - data on surface area (ha) of land coverage and land use as Indigenous Land from 1985 to 2023]. (Database – Collection 9). São Paulo: MapBiomas, 2024. Available at: <<https://brasil.mapbiomas.org/estatisticas/>>. Accessed on: 11 Sep. 2024.

MINISTRY OF ENVIRONMENT(MMA). Institutional: Map of vegetation cover - Amazon. Brasília: Funcate, 2024. Available at: <<https://antigo.mma.gov.br/biomas/amaz%C3%B4nia/mapa-de-cobertura-vegetal.html>> Accessed on: 10 Sep. 2024.

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

MORA, C. et al. How many species are there on Earth and in the ocean? **PLOS Biology**, v. 9, n. 8, e1001127, 2011. Available at: <<https://doi.org/10.1371/journal.pbio.1001127>>. Accessed on: 8 Sep. 2024.

MYSTER, R. W. The physical structure of

forests in the Amazon Basin: a review. **The Botanical Review**, v. 82, n. 4, p. 407-27, 2016. Available at: <<https://doi.org/10.1007/s12229-016-9174-x>>. Accessed on: 19 Sep. 2024.

NISKANEN, T. et al. Pushing the frontiers of biodiversity research: unveiling the global diversity, distribution, and conservation of fungi. **Annual Review of Environment Resources**, v. 48, n. 1, p. 149-76, 2023. Available at: <<https://www.annualreviews.org/content/journals/10.1146/annurev-environ-112621-090937>>. Accessed on: 19 Sep. 2024.

REFLORA PROJECT; NATIONAL COUNCIL FOR SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT (CNPq). **Reflora** – Virtual herbarium. (Database). Available at: <<https://floradobrasil.jbrj.gov.br/reflora/PrincipalUC/PrincipalUC.dojsessionid=111B6F3E16CE43C-072C9EF4C640FA42C>>. Accessed on: 9 Sep. 2024.

PACHECO, J. F. et al. Annotated checklist of the birds of Brazil by the Brazilian Ornithological Records Committee – Second edition. **Ornithological Research**, v. 29, n. 2, p. 94-105, 2021. Available at: <<https://doi.org/10.1007/s43388-021-00058-x>>. Accessed on: 19 Sep. 2024.

QUINTELA, F. M.; ROSA, C. A.; FEIJÓ, A. Updated and annotated checklist of recent mammals from Brazil. **Anais da Academia Brasileira de Ciências** [Annals of the Brazilian Academy of Sciences], n. 92, supl. 2, e20191004, 2020. Available at: <<https://doi.org/10.1590/0001-37652020191004>>. Accessed on: 19 Sep. 2024.

RITTER, C. D. et al. Advancing biodiversity assessments with environmental DNA: Long-read technologies help reveal the drivers

of Amazonian fungal diversity. **Ecology and Evolution**, v. 10, n. 14, p. 7509-24, 2020. Available at: <<https://doi.org/10.1002/ece3.6477>>. Accessed on: 19 Sep. 2024.

SARKAR, S. Origin of the term biodiversity. **BioScience**, v. 71, n. 9, p. 893, 2021. Available at: <<https://doi.org/10.1093/biosci/biab071>>. Accessed on: 19 Sep. 2024.

SECRETARIAT OF THE CONVENTION ON BIOLOGICAL DIVERSITY. **GBO-5 – The global biodiversity outlook 5**. UN: New York, 2020. (Report). Available at: <<https://www.cbd.int/gbo5>>. Accessed on: 19 Sep. 2024.

SEGALLA, M. V. et al. List of Brazilian Amphibians. **Herpetologia Brasileira** [Brazilian Herpetology], 2021. Available at: <<https://sbherpetologia.org.br/lista-anfibios-sbh-copy>>. Accessed on: 19 Sep. 2024.

SISTEMA DE INFORMAÇÃO SOBRE A BIODIVERSIDADE BRASILEIRA. [INFORMATION SYSTEM ON BRAZILIAN BIODIVERSITY] Sistema de informação sobre a biodiversidade brasileira. [Information system on Brazilian biodiversity] Available at: <<https://www.sibbr.gov.br/page/infografico.html>>. Accessed on: 11 Sep. 2024.

SPACE PANEL FOR THE AMAZON (SPA). Amazon assessment report 2021. (Executive Summary) Available at: <[https://www.theamazonwewant.org/spa\\_publication/amazon-assessment-report-2021/](https://www.theamazonwewant.org/spa_publication/amazon-assessment-report-2021/)>. Accessed on: 20 Sep. 2024.

UMA CONCERTAÇÃO PELA AMAZÔNIA (Org.). Propostas para as Amazônias: uma abordagem integradora [Proposals for the Amazônias – an Integrated Approach]. São

Paulo: Instituto Arapyauí, 2023.

UNITED NATIONS. **6th National Report for the Convention on Biological Diversity**. UN: New York, 2020. (Report). Available at: <<https://www.cbd.int/doc/nr/nr-06/br-nr-06-en.pdf>>. Accessed on: 11 Sep. 2024.

WAISBICH, L. T. 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 illegal economies of the forest] Rio de Janeiro: Instituto Igarapé, 2022. Available at: <[https://igarape.org.br/wp-content/uploads/2022/03/AE-55\\_O-ecossistema-do-crime-ambiental-na-Amazonia.pdf](https://igarape.org.br/wp-content/uploads/2022/03/AE-55_O-ecossistema-do-crime-ambiental-na-Amazonia.pdf)>. Accessed on: 9 Sep. 2024.

VALOR ECONÔMICO. 2021. Como as abelhas ajudam a agregar R\$ 43 bilhões por ano à agricultura brasileira. [How bees help add R\$43 billion per year to Brazilian agriculture.] Available at: <<https://valor.globo.com/patrocinado/projeto-especial-esg/noticia/2021/09/14/como-as-abelhas-ajudam-a-agregar-r-43-bilhoes-por-ano-a-agricultura-brasileira.ghtml#>>. Accessed on: 23 Sep. 2024.

WIENS, J. J.: How many species are there on Earth? Progress and problems. **PLOS Biology**, v. 21, n. 11, e3002388, 2023. Available at: <<https://doi.org/10.1371/journal.pbio.3002388>>. Accessed on: 19 Sep. 2024.

ZEMP, D. C. et al. On the importance of cascading moisture recycling in South America. **Atmospheric Chemistry and Physics**, v. 14, n. 23, p. 13337-59, 2014. Available at: <<https://acp.copernicus.org/articles/14/13337/2014/>>. Accessed on: 8 Sep. 2024.

## CITIES

BRAZIL. Federal Constitution (1988). **Constitution of the Federative Republic of Brazil**. Brasília: Federal Senate. Available at: <[www.planalto.gov.br/ccivil\\_03/constituicao/constituicao.htm](http://www.planalto.gov.br/ccivil_03/constituicao/constituicao.htm)> Accessed on: 30 Jun. 2024.

CARDOSO, Ana Claudia D. Que contribuições virão da Amazônia brasileira para o urbanismo do século XXI? [What contributions will come from the Brazilian Amazon to 21st century urban planning?]. **Thésis**, v. 6, n. 11, p. 36-53, 2021. Available at: <<https://thesis.anparq.org.br/revista-thesis/article/view/266/264>>. Accessed on: 3 Jul. 2024.

CHEIN, F.; PROCÓPIO, I. V. **As cidades na Amazônia Legal**: diagnóstico, desafios e oportunidades para urbanização sustentável [Cities in the Legal Amazon: diagnosis, challenges and opportunities for sustainable urbanization]. Juiz de Fora: **Amazônia 2030**, 2022. Available at: <<https://amazonia2030.org.br/as-cidades-na-amazonia-legal-diagnostico-desafios-e-opportunidades-para-urbanizacao-sustentavel/>>. Accessed on: 9 Oct. 2024.

DA SILVA, J. N. P. O processo de urbanização na Amazônia: destacando as cidades dos notáveis, cidades-empresas, cidades rodovias e as cidades tradicionais. [The urbanization process in the Amazon: highlight on the cities of prominent citizens, company-cities, highway-cities and traditional cities] **Somanlu: Revista de Estudos Amazônicos** [Journal of Amazonian Studies], v. 19, n. 1, 2019. Available at: <[www.periodicos.ufam.edu.br/index.php/somanlu/article/view/5866](http://www.periodicos.ufam.edu.br/index.php/somanlu/article/view/5866)>. Accessed on: 30 Jun. 2024.

IBGE CIDADES [IBGE Cities]. A Panorama of Manaus/AM. Available at: <<https://cidades.ibge.gov.br/brasil/am/manaus/panorama>>. Accessed on: 21 Nov 2024.

Brazilian Institute of Geography and Statistics (IBGE). 2022 Demographic Census. Rio de Janeiro: IBGE, 2024. Available at: <<https://censo2022.ibge.gov.br/>>. Accessed on: 9 Jul. 2024.

Brazilian Institute of Geography and Statistics (IBGE). Áreas urbanizadas do Brasil: 2019 [Urbanized areas in Brazil: 2019]. Rio de Janeiro: Coordenação de Meio Ambiente [Coordination for the Environment], 2022. Available at: <<https://www.ibge.gov.br/geociencias/informacoes-ambientais/cobertura-e-uso-da-terra/15789-areas-urbanizadas.html?=&t=publicacoes>>. Accessed on: 9 Jul. 2024.

Brazilian Institute of Geography and Statistics (IBGE). Produto Interno Bruto dos Municípios – 2021 [Gross Domestic Product of Municipalities – 2021]. Available at: <<https://cidades.ibge.gov.br/brasil/am/manaus/pesquisa/38/46996?tipo=ranking&indicador=47007>>. Accessed on: 21 Nov 2024.

Brazilian Institute of Geography and Statistics (IBGE). **Regiões de Influência das Cidades – 2018** [Areas of Influence of Cities – 2018]. Rio de Janeiro: IBGE, 2020. Available at: <<https://biblioteca.ibge.gov.br/index.php/biblioteca-catalogo?view=detalhes&id=2101728>>. Accessed on: 9 Jul. 2024

MACHADO, L. O. et al. **Proposta de reestruturação do Programa de Desenvolvimento da Faixa de Fronteira**: bases de uma política integrada de desenvolvimento regional para a faixa de fronteira [**Proposal for restructuring the Border Strip Development Program**: bases for an integrated regional development policy for the border strip]. Brasília: Ministry of National Integration, 2005. Available at: <<http://www.retis.igeo.ufrrj.br/wp-content/uploads/2005-livro-PDFF.pdf>>. Accessed on: 5 Jul. 2024.

MACHADO, L. O. A geopolítica do governo local: proposta de abordagem aos novos territórios urbanos da Amazônia [The geopolitics of local government: a proposed approach to new urban territories in the Amazon]. **Proceedings of the 3rd National Symposium on Urban Geography**, 1993. Available at: <<http://mcm.campanhacompleta.com.br/files/2013/06/1993-geopolitica-do-governo-local-LOM.pdf>>. Accessed on: 9 Jul. 2024.

QUEIROZ, J. F. S. Amazônia: inferno verde ou paraíso perdido? [The Amazon: Green Inferno or Paradise Lost?]. Cenário e território na literatura escrita por Alberto Rangel e Euclides da Cunha. [Landscape and territory in the literature written by Alberto Rangel and Euclides da Cunha] **Nova Revista Amazônica**, v. 5, n. 3, p. 11-32, 2017. Available at: <<https://www.periodicos.ufpa.br/index.php/nra/article/view/6256>>. Accessed on: 28 Jun. 2024.

OLIVEIRA, José Aldemir. Cidades na selva [Cities in the Jungle]. Manaus: Valer, 2000.

SANTOS, M. **A urbanização brasileira** [Brazilian Urbanization]. São Paulo: Editora de Humanismo, Ciência e Tecnologia [Science and Technology], 1993.

TRINDADE JR, S. C. C. 22 Jun 2015 - Cidades Amazônicas [Amazonian Cities]. Instituto Democracia e Sustentabilidade - IDS, 25 Jun. 2015. Video recording, 2h40min17s. Available at: <<https://www.youtube.com/watch?v=VB-vnKffmhlq>>. Accessed on: 9 Jul. 2024.

VICENTINI, Y. **Cidade e história na Amazônia. [City and history in the Amazon]** Curitiba: Federal University of Paraná (UFPR) Publishing House, 2004.

## CULTURE

BANIWA, A. et al. Saberes, desafios e visão de futuro dos povos da Amazônia. [Know-

edge, challenges and vision for the future by the peoples of the Amazon] **Amazônia Latitude**, [s.l.], 16 Feb. 2023 [online]. Available at: <<https://www.amazonialatitude.com/2023/02/16/somos-amazonia-sa-beres-desafios-e-visao-de-futuro-dos-povos-da-floresta/>>. Accessed on: 20 Sep. 2024.

BARROSO, S. A.; ARAÚJO, J. N. Entre símbolos e imagens: por uma crítica à noção de “cultura amazônica” [Between symbols and images: for a critical view on the notion of “Amazonian culture”]. **EDUCAmazônia**, v. 5, n. 2, p. 1-13, 2010.

BRAGA, D. A terceira margem do mito: hermenêutica da corporeidade [The third margin of the myth: hermeneutics of corporeality]. **Terceira Margem**, v. 14, n. 22, p. 51-64, 2010. Available at: <<https://revistas.ufrrj.br/index.php/tm/article/view/10959/8018>>. Accessed on: 10 Oct. 2024.

COSTA, E. Passa de 3 mil o número de venezuelanos vivendo em prédios abandonados em Boa Vista [More than 3,000 Venezuelans live in abandoned buildings in the city of Boa Vista]. **G1**, Boa Vista, 8 Jan. 2020. Available at: <<https://g1.globo.com/r/roraima/noticia/2020/01/08/passa-de-3-mil-o-numero-de-venezuelanos-vivendo-em-predios-abandonados-em-boa-vista.ghtml>>. Accessed on: 10 Aug. 2024.

CHAUÍ, M. **Cultura e democracia** [Culture and Democracy]. Salvador: Bahia State Department of Culture, 2012.

CULTURA VIVA. Website. Available at: <<https://www.gov.br/culturaviva/pt-br>>. Accessed on: 3 Sep. 2024.

EMMI, M. F. **Fluxos migratórios internacionais para a Amazônia brasileira do final do século XIX ao início do século XX** - o caso

dos italianos [International migration flows to the Brazilian Amazon from the late 19th century to the early 20th century - the case of the Italians]. Belém: Núcleo de Altos Estudos Amazônicos [Center for Advanced Amazonian Studies], 2009. (NAEA Papers, n. 240). Available at: <<https://periodicos.ufpa.br/index.php/pnaea/article/viewFile/11394/7854>>. Accessed on: 11 Sep. 2024.

FERNANDES, J. S. N.; MOSER, L. Comunidades tradicionais: a formação sócio-histórica na Amazônia e o (não) lugar das comunidades ribeirinhas [Traditional communities: social and historical formation of the Amazon and the (absent) place of riverine communities]. **Revista Katálysis**, v. 24, n. 3, p. 532-41, 2021. Available at: <<https://www.scielo.br/rj/rk/a/3jFxmCxy4FVJ4Cj8W3Grt9w?format=pdf&lang=pt>>. Accessed on: 10 Oct. 2024.

FRAXE, T. J. P.; WITKOSKI, A. C.; MIGUEZ, S. F. O ser da Amazônia: identidade e invisibilidade [The Amazonian being: identity and invisibility]. São Paulo: **Ciência e Cultura** [Science and Culture], v. 61, n. 3, p. 30-2, 2009. Available at: <[http://cienciaecultura.bvs.br/scielo.php?script=sci\\_arttext&pid=S0009-67252009000300012](http://cienciaecultura.bvs.br/scielo.php?script=sci_arttext&pid=S0009-67252009000300012)>. Accessed on: 10 Oct. 2024.

GEERTZ, C. **A interpretação das culturas [The Interpretation of Cultures]**. Rio de Janeiro: Zahar, 1981.

Brazilian Institute of Geography and Statistics (IBGE). **PNAD Contínua** – Pesquisa Nacional por Amostra de Domicílios Contínua [Continuous National Household Sample Survey] 2023. Rio de Janeiro: IBGE, 2023. Available at: <<https://www.ibge.gov.br/estatisticas/sociais/trabalho/17270-pnad-continua.html>>. Accessed on: 4 Sep. 2024.

Brazilian Institute of Geography and Statistics

(IBGE). **SIIC** – Sistema de informações e indicadores culturais [System of Cultural Information and Indicators]. Rio de Janeiro: IBGE, 2022. Available at: <<https://www.ibge.gov.br/estatisticas/multidominio/cultura-recreacao-e-esporte/9388-indicadores-culturais.html>>. Accessed on: 20 Aug. 2024.

Brazilian Institute of Geography and Statistics (IBGE). Áreas urbanizadas do Brasil: 2019 [Urbanized areas in Brazil: 2019]. Coordenação de Meio Ambiente: [Coordination for the Environment] Rio de Janeiro, 2022a. Available at: <https://www.ibge.gov.br/geociencias/informacoes-ambientais/cobertura-e-uso-da-terra/15789-areas-urbanizadas.html?=&t=publicacoes> Accessed on: 09 Jul 2024

Brazilian Institute of Geography and Statistics (IBGE). 2022 Demographic Census. IBGE, 2024. Available at: <https://censo2022.ibge.gov.br/> Accessed on: 09 Jul 2024

JAKOB, A. A. E. A migração internacional recente na Amazônia brasileira [Recent international migration in the Brazilian Amazon]. **REMHU – Revista Interdisciplinar da Mobilidade Humana** [Interdisciplinary Journal of Human Mobility], Brasília, v. 23, n. 45, p. 249-71, 2015. Available at: <<https://www.scielo.br/j/remhu/a/JVQM3sggXyBWrrf8jxX4CPh/?format=pdf&lang=pt>>. Accessed on: 10 Oct. 2024.

KAMBEBA, M. W. **Ay Kakyri Tama (Eu moro na Cidade)** [Ay Kakyri Tama (I live in the city)]. Manaus: Grafisa, 2013.

KAMBEBA, M. W. Carta dos povos da floresta à sociedade não indígena em tempos de pandemia e violências [Letter from forest peoples to non-indigenous society in times of pandemic and violence]. **Sens Public**, n. SP1656, 2022. Available at: <<https://sens-public.org/articles/1658/>>. Accessed on: 10 Oct. 2024.

LARAIA, R. B. **Cultura: um conceito antropológico** [Culture: an anthropological concept]. Rio de Janeiro: Zahar, 1986.

LIRA, T. M.; CHAVES, M. P. S. R. Comunidades ribeirinhas na Amazônia: organização socio-cultural e política [Riverine communities in the Amazon: social, cultural and political organization]. **Interações**, Campo Grande, v. 17, n. 1, p. 66-76, 2016. Available at: <<https://www.scielo.br/j/inter/a/MXbhGK5VDQbX4bMQzRYDR-LN/?format=pdf&lang=pt>> Accessed on: 10 Oct. 2024.

OLIVEIRA, M. P.; REIS, T. S. Povos tradicionais e suas lutas por direitos na Amazônia brasileira. [Traditional peoples and their struggles for rights in the Brazilian Amazon] In: CAV-ALCANTI, E. V. et al. (org.). **Leituras sobre a Amazônia**: cultura, memória e ensino [Readings on the Amazon: culture, memory and teaching]. São Luís: EDUFMA, 2021. p. 33-50.

LOUREIRO, J. J. P. Mundamazônico: do local ao global [Amazonian world: from local to global]. **Revista Sentidos da Cultura** [Sentidos da Cultura Journal], Belém, v. 1, n. 1, p. 31-40, 2014. Available at: <<https://periodicos.uepa.br/index.php/sentidos/article/view/352>>. Accessed on: 10 Oct. 2024.

LOUREIRO, J. J. P. Cultura amazônica: uma diversidade diversa [Amazonian p. culture: a diverse diversity]. **Amazônia Latitude**, [s. l.], 10 Apr. 2019 [online]. Available at: <<https://www.amazonialatitude.com/2019/04/10/cultura-amazonica-uma-diversidade-diversa/>>. Accessed on: 22 May. 2024.

SANTOS, E. T. O ciclo do marabaixo macapaense: discursos, lutas e representação social. [The Macapá Marabaixo cycle: speeches, struggles and social representation] **Cadernos de Linguagem e Sociedade** [Journals on Language and Society], v. 19, n. 1, p. 232-50, 2018.

Available at: <<https://periodicos.unb.br/index.php/les/article/view/10882/9548>>. Accessed on: 10 Oct. 2024.

National System of Public Libraries (SNBP). Institutional: Brazilian Public Libraries. Available at: <<http://snbp.cultura.gov.br/bibliotecaspublicas/>>. Accessed on: 22 Jul. 2024.

## ENERGY

Energy Research Company (EPE). **Planejamento do atendimento aos sistemas isolados – Ciclo 203**: horizonte 2024 a 2028 [Planning for serving isolated systems – Cycle 203: 2024 to 2028]. Rio de Janeiro: EPE, 2023. Available at: <<https://www.epe.gov.br/pt/publicacoes-dados-abertos/publicacoes/planejamento-do-atendimento-aos-sistemas-isolados-ciclo-2023>>. Accessed on: 30 Aug. 2024.

Energy Research Company (EPE). **BEN – Boletim Energético Nacional**: Relatório-Síntese 2024 – Ano-base 2023 [BEN – National Energy Bulletin: 2024 Summary Report – Base Year 2023]. Rio de Janeiro: EPE, 2024. Available at: <[https://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/PublicacoesArquivos/publicacao-819/topico-715/BEN\\_S%C3%ADntese\\_2024\\_PT.pdf](https://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/PublicacoesArquivos/publicacao-819/topico-715/BEN_S%C3%ADntese_2024_PT.pdf)> Accessed on: 28 Aug. 2024.

Institute for Energy and the Environment (IEMA). **Um milhão estão sem energia elétrica na Amazônia, mostra IEMA** [One million people without electricity in the Amazon, IEMA reports]. São Paulo: IEMA, 2019. Available at: <<https://energiaeambiente.org.br/um-milhao-estao-sem-energia-eletrica-na-amazonia-20191125>> Accessed on: 28 Aug. 2024.

Institute for Energy and the Environment (IEMA). **Análise dos recursos disponíveis e necessários para universalizar o acesso à**

**energia elétrica na Amazônia Legal** [Analysis of available and necessary resources to universalize access to electricity in the Legal Amazon]. São Paulo: IEMA, 2023. Available at: <[https://energiaeambiente.org.br/wp-content/uploads/2023/11/IEMA\\_universalizacao\\_notatecnica\\_custos.pdf](https://energiaeambiente.org.br/wp-content/uploads/2023/11/IEMA_universalizacao_notatecnica_custos.pdf)> Accessed on: 30 Aug. 2024.

Institute for Energy and the Environment (IEMA). **Subsistema Norte gerou 27% da energia elétrica proveniente de termelétricas fósseis de serviço público, aponta estudo do IEMA** [The North Subsystem generated 27% of the electrical energy from public service fossil fuel thermoelectric plants, according to a study by IEMA]. São Paulo: IEMA, 2022. Available at: <[BISPO, F. Transição energética gera corrida por minerais estratégicos com 5 mil requerimentos na Amazônia \[Energy transition causes a race for strategic minerals with 5 thousand applications in the Amazon\]. \*\*Infoamazonia\*\*, 11 Jun. 2024. Available at: <<https://infoamazonia.org/2024/06/11/transicao-energetica-gera-corrída-por-minerais-estrategicos-com-5-mil-requerimentos-na-amazonia/>>. Accessed on: 29 Aug. 2024.](https://energiaeambiente.org.br/subsistema-norte-gerou-27-da-energia-eletrica-proveniente-de-termeltricas-fosseis-de-servico-publico-aponta-estudo-do-iema-20220630#:~:text=O%20Subsistema%20Norte%2C%20composto%20por,%20carbono%20equivalente%20(CO2e).> Accessed on: 30 Aug. 2024.</p></div><div data-bbox=)

INSTITUTO ESCOLHAS. **Potencial de produção de biogás na região amazônica: oportunidades de bioeconomia** [Biogas production potential in the Amazon region: bioeconomy opportunities]. São Paulo: Instituto Escolhas, 2021. Available at: <<https://escolhas.org/publicacao/biogas-energia-limpa-para-amazonia/>> Accessed on: 28 Aug. 2024.

INSTITUTO IGARAPÉ. **Minerais críticos e estratégicos do Brasil em um mundo em transformação** [Brazil's critical and strategic minerals in a changing world]. Rio de Janeiro: Instituto Igarapé, 2023. Available at: <<https://igarape.org.br/minerais-criticos-e-estrategicos-do-brasil-em-um-mundo-em-transformacao>>. Accessed on: 29 Aug. 2024.

National Electric System Operator – ONS. (2023). Intercâmbio Nacional – 2023. Brasília: ONS, 2023. Available at: <<https://dados.ons.org.br/dataset/intercambio-nacional/resource/8ee21223-9ff2-4485-9f74-404d76c7835a>> Accessed on: 29 Aug. 2024.

SILVA, V. O. et al. (2024). Photovoltaic systems, costs, and electrical and electronic waste in the Legal Amazon: An evaluation of the Luz para Todos Program. **Renewable and Sustainable Energy Reviews**, v. 203, p. 114721, 2024. Available at: <<https://www.sciencedirect.com/science/article/abs/pii/S1364032124004477?via%3DIihub>>. Accessed on: 27 Aug. 2024.

SCHUTZE, A.; BINES, L.; ASSUNÇÃO, J. **Rios de diesel na Amazônia Legal**: por que a região com as maiores hidrelétricas do país depende de combustível caro e poluente? [Diesel Rivers in the Legal Amazon: why does the region with the largest hydroelectric plants in the country depend on expensive and polluting fuel?]. Rio de Janeiro: Climate Policy Initiative, 2022. Available at: <<https://www.climatepolicyinitiative.org/pt-br/publication/rios-de-diesel-na-amazonia-legal-por-que-a-regiao-com-as-maiores-hidreletricas-do-pais-depende-de-combustivel-carro-e-poluente/>> Accessed on: 30 Aug. 2024.

#### TERRITORIAL PLANNING AND LAND REGULARIZATION

ALMEIDA, J.; ANDRADE, R. A.; BRITO, B.;

GOMES, P. G. **Leis e práticas de regularização fundiária nos Estados da Amazônia Legal no estado do Acre** [Laws and practices of land regularization in the states of the Legal Amazon in the state of Acre]. Belém: Instituto do Homem e Meio Ambiente da Amazônia [Amazon Institute of People and the Environment], 2021a. Available at: <[https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar\\_Acre.pdf](https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar_Acre.pdf)>. Accessed on: 11 Oct. 2024.

ALMEIDA, J.; ANDRADE, R. A.; BRITO, B.; GOMES, P. G. **Leis e práticas de regularização fundiária nos Estados da Amazônia Legal no estado do Amapá** [Laws and practices of land regularization in the states of the Legal Amazon in the state of Amapá]. Belém: Instituto do Homem e Meio Ambiente da Amazônia [Amazon Institute of People and the Environment], 2021b. Available at: <[https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar\\_Amapa.pdf](https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar_Amapa.pdf)>. Accessed on: 11 Oct. 2024.

ALMEIDA, J.; ANDRADE, R. A.; BRITO, B.; GOMES, P. G. **Leis e práticas de regularização fundiária nos Estados da Amazônia Legal no estado do Amazonas** [Laws and practices of land regularization in the states of the Legal Amazon in the state of Amazonas]. Belém: Instituto do Homem e Meio Ambiente da Amazônia [Amazon Institute of People and the Environment], 2021c. Available at: <[https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar\\_Amazonas.pdf](https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar_Amazonas.pdf)>. Accessed on: 11 Oct. 2024.

ALMEIDA, J.; ANDRADE, R. A.; BRITO, B.; GOMES, P. G. **Leis e práticas de regularização fundiária nos Estados da Amazônia Legal no estado do Maranhão** [Laws and practices of land regularization in the states of the Legal Amazon in the state of Maranhão].

Belém: Instituto do Homem e Meio Ambiente da Amazônia [Amazon Institute of People and the Environment], 2021d. Available at: <[https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar\\_Maranhao.pdf](https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar_Maranhao.pdf)>. Accessed on: 11 Oct. 2024.

ALMEIDA, J.; ANDRADE, R. A.; BRITO, B.; GOMES, P. G. **Leis e práticas de regularização fundiária nos Estados da Amazônia Legal no estado do Mato Grosso** [Laws and practices of land regularization in the states of the Legal Amazon in the state of Mato Grosso]. Belém: Instituto do Homem e Meio Ambiente da Amazônia [Amazon Institute of People and the Environment], 2021e. Available at: <[https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar\\_Matogrosso.pdf](https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar_Matogrosso.pdf)>. Accessed on: 11 Oct. 2024.

ALMEIDA, J.; ANDRADE, R. A.; BRITO, B.; GOMES, P. G. **Leis e práticas de regularização fundiária nos Estados da Amazônia Legal no estado do Tocantins** [Laws and practices of land regularization in the states of the Legal Amazon in the state of Tocantins]. Belém: Instituto do Homem e Meio Ambiente da Amazônia [Amazon Institute of People and the Environment], 2021f. Available at: <[https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar\\_Para.pdf](https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar_Para.pdf)>. Accessed on: 11 Oct. 2024.

ALMEIDA, J.; ANDRADE, R. A.; BRITO, B.; GOMES, P. G. **Leis e práticas de regularização fundiária nos Estados da Amazônia Legal no estado do Pará** [Laws and practices of land regularization in the states of the Legal Amazon in the state of Pará]. Belém: Instituto do Homem e Meio Ambiente da Amazônia [Amazon Institute of People and the Environment], 2021g. Available at: <[https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar\\_Rondonia.pdf](https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar_Rondonia.pdf)>.

ALMEIDA, J.; ANDRADE, R. A.; BRITO, B.; GOMES, P. G. **Leis e práticas de regularização fundiária nos Estados da Amazônia Legal no estado do Rondônia** [Laws and practices of land regularization in the states of the Legal Amazon in the state of Rondônia]. Belém: Instituto do Homem e Meio Ambiente da Amazônia [Amazon Institute of People and the Environment], 2021h. Available at: <[https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar\\_Tocantins.pdf](https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar_Tocantins.pdf)>. Accessed on: 11 Oct. 2024.

ALMEIDA, J.; ANDRADE, R. A.; BRITO, B.; GOMES, P. G. **Leis e práticas de regularização fundiária nos Estados da Amazônia Legal no estado do Acre** [Laws and practices of land regularization in the states of the Legal Amazon in the state of Acre]. Belém: Instituto do Homem e Meio Ambiente da Amazônia [Amazon Institute of People and the Environment], 2021i. Available at: <[https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar\\_Acre.pdf](https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar_Acre.pdf)>. Accessed on: 11 Oct. 2024.

Accessed on: 11 Oct. 2024.

ALMEIDA, J.; ANDRADE, R. A.; BRITO, B.; GOMES, P. G. **Leis e práticas de regularização fundiária nos Estados da Amazônia Legal no estado do Roraima** [Laws and practices of land regularization in the states of the Legal Amazon in the state of Roraima]. Belém: Instituto do Homem e Meio Ambiente da Amazônia [Amazon Institute of People and the Environment], 2021h. Available at: <[https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar\\_Amazonas.pdf](https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar_Amazonas.pdf)>. Accessed on: 11 Oct. 2024.

ALMEIDA, J.; ANDRADE, R. A.; BRITO, B.; GOMES, P. G. **Leis e práticas de regularização fundiária nos Estados da Amazônia Legal no estado do Tocantins** [Laws and practices of land regularization in the states of the Legal Amazon in the state of Tocantins]. Belém: Instituto do Homem e Meio Ambiente da Amazônia [Amazon Institute of People and the Environment], 2021i. Available at: <[https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar\\_Tocantins.pdf](https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar_Tocantins.pdf)>. Accessed on: 11 Oct. 2024.

BAFARASAT, A. Z. Reflections on the three schools of thought on strategic spatial planning. **Journal of Planning Literature**, v. 30(2), p. 132-48, 2015. Available at: <<https://journals.sagepub.com/doi/abs/10.1177/0885412214562428?journal-Code=jplb>>. Accessed on: 11 Oct. 2024.

Brito, B. **Regularização fundiária em áreas federais na Amazônia Legal**: lições, desafios e recomendações [Land regularization in federal areas in the Legal Amazon: lessons, challenges and recommendations]. Belém: Instituto do Homem e Meio Ambiente da Amazônia [Amazon Institute of People and the Environment], 2022. Available at: <[https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar\\_Rondonia.pdf](https://amazon.org.br/wp-content/uploads/2021/03/LeisRegularizacaoFundiar_Rondonia.pdf)>.

[amazon.org.br/publicacoes/regularizacao-fundiaria-em-areas-federais-na-amazonia-legal-licoes-desafios-e-recomendacoes/](https://amazon.org.br/publicacoes/regularizacao-fundiaria-em-areas-federais-na-amazonia-legal-licoes-desafios-e-recomendacoes/)> Accessed on: 6 Aug. 2024.

FAO/SEAD. **Governança de terras**: da teoria à realidade brasileira [Land governance: from theory to Brazilian reality]. Brasília: FAO/SEAD, 2017. Available at: <<https://governancadeterreas.com.br/2017/10/06/livro-governanca-de-terras-da-teoria-a-realidade-brasileira/>>. Accessed on: 11 Oct. 2024.

INSTITUTO ESCOLHAS. **Ordenamento territorial na Amazônia Legal**: subsídios para a formulação e tomadas de decisão em políticas públicas [Territorial planning in the Legal Amazon: subsidies for formulation and decision-making in public policies]. São Paulo: Instituto Escolhas, 2023. (Technical Report). Available at: <[https://escolhas.org/wp-content/uploads/2023/10/Relatorio\\_MesmoJogoNovasRegras.pdf](https://escolhas.org/wp-content/uploads/2023/10/Relatorio_MesmoJogoNovasRegras.pdf)>. Accessed on: 23 Aug. 2024.

INSTITUTO DE PESQUISA AMBIENTAL DA AMAZÔNIA [AMAZON ENVIRONMENTAL RESEARCH INSTITUTE] (IPAM). A grilagem de terras públicas na Amazônia brasileira [Land grabbing of public lands in the Brazilian Amazon]. Brasília: MMA, 2006. Available at: <[https://antigo.mma.gov.br/estruturas/225/arquivos/9\\_a\\_grilagem\\_de\\_terras\\_pblcas\\_na\\_amaznia\\_brasileira\\_225.pdf](https://antigo.mma.gov.br/estruturas/225/arquivos/9_a_grilagem_de_terras_pblcas_na_amaznia_brasileira_225.pdf)>. Accessed on: 11 Oct. 2024.

OXFAM BRASIL. **Terrenos da desigualdade**: terra, agricultura e desigualdades no Brasil rural [Lands of inequality: land, agriculture and inequalities in rural Brazil]. São Paulo: Oxfam Brasil, 2016. Available at: <<https://www.oxfam.org.br/publicacao/terrenos-da-desigualdade-terra-agricultura-e-desigualdade-no-brasil-rural/>>. Accessed on: 4 Aug. 2024.

RAJÃO, R. et al. The rotten apples of Brazil's agribusiness. **Insights**, v. 369, n. 6501, 2020. Available at: <[http://www.lagesa.org/wp-content/uploads/documents/Rajao\\_20\\_Rotten%20apples\\_w\\_SM.pdf](http://www.lagesa.org/wp-content/uploads/documents/Rajao_20_Rotten%20apples_w_SM.pdf)> Accessed on: 6 Aug. 2024.

SPAROVEK, G. et al. Who owns the Brazilian lands? Land use policy. **Science Direct**, v. 87, p. 1-3, 2019. Available at: <<https://www.sciencedirect.com/science/article/abs/pii/S0264837719304077>>. Accessed on: 10 Aug. 2024.

#### AGRI-FOOD SYSTEMS

ABRAMOVAY, R. et al. Promoting Diversity in Agricultural Production Towards Healthy and Sustainable Consumption. **T20 Policy Brief**, 2023. Available at: <[https://catedraic.fsp.usp.br/wp-content/uploads/2023/06/2023\\_T20\\_PolicyBrief\\_TF3\\_DiversityInAgriculture.pdf](https://catedraic.fsp.usp.br/wp-content/uploads/2023/06/2023_T20_PolicyBrief_TF3_DiversityInAgriculture.pdf)>. Accessed on: 18 Sep. 2024.

ARAÚJO, T.; DAVEL, A. P.; CARNEIRO, E. M. Life-long health consequences of undernutrition in the Yanomami indigenous population in Brazil. **Nature Medicine**, v. 30, p. 1809-10, 2024. Available at: <<https://www.nature.com/articles/s41591-024-02991-y>>. Accessed on: 16 Sep. 2024.

BESSA, E. Garimpo e desnutrição dos yanomami na perspectiva da pesca [Mining and malnutrition of the Yanomami from the perspective of fishing]. **Nexo Jornal**, 18 May. 2023. Available at: <<https://pp.nexojornal.com.br/opiniao/2023/05/18/garimpo-e-desnutricao-dos-yanomami-na-perspectiva-da-pesca/>> Accessed on: 17 Sep. 2024.

BOMBARDI, L. M. **Agrotóxicos e colonialismo químico** [Pesticides and chemical colonialism]. São Paulo: Elefante, 2023.

BRAZIL. Law No. 11,346, of 15 September 2006. Lei Orgânica de Segurança Alimentar e Nutricional [Organic Law on Food and Nutrition Security] (LOSAN). Regulates policies for access to and promotion of healthy food and water, in addition to encouraging the production, marketing and consumption of food from family farming. **Diário Oficial da União** [Federal Official Gazette], Brasília, Section 1, p. 1. Available at: <[https://www.planalto.gov.br/ccivil\\_03/\\_ato2004-2006/2006/lei/11346.htm](https://www.planalto.gov.br/ccivil_03/_ato2004-2006/2006/lei/11346.htm)>. Accessed on: 18 Sep. 2024

BRAUN, J. V. et al. Food systems: Seven priorities to end hunger and protect the planet. In: BRAUN, J. V.; AFSANA, K.; FRESCO, L. O.; HASSAN, M. H. A. (Eds.) **Science and innovations for food systems transformation**. Springer, Cham, 2023. Available at: <[https://link.springer.com/chapter/10.1007/978-3-031-15703-5\\_1](https://link.springer.com/chapter/10.1007/978-3-031-15703-5_1)>. Accessed on: 5 Sep. 2024.

CASTRO, J. **Geografia da fome: o dilema brasileiro: pão ou aço** [Geography of hunger: the Brazilian dilemma: bread or steel]. Rio de Janeiro: Edições Antares, 1984.

CENTRO DE INTELIGÊNCIA PARA GOVERNANÇA DE TERRAS E DESENVOLVIMENTO SUSTENTÁVEL [INTELLIGENCE CENTER FOR LAND GOVERNANCE AND SUSTAINABLE DEVELOPMENT] (CITE). **Raio X das pastagens da Amazônia Legal** [An X-ray of pastures in the Legal Amazon] (in press). 56 pg. 2024. In press.

EAT CITIES. (Website). 2022. Available at: <<https://eatforum.org/initiatives/cities/>>. Accessed on: 12 Sep 2024.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO). **Sustainable food systems**: concept and framework.

Rome: FAO, 2018. (Report). Available at: <<https://openknowledge.fao.org/server/api/core/bitstreams/b620989c-407b-4caf-a152-f790f55fec71/content>>. Accessed on: 20 Sep. 2024.

UNITED NATIONS. 2024. **The state of food security and nutrition in the world 2024** – Financing to end hunger, food insecurity and malnutrition in all its forms. FAO: Rome, 2024. Available at: <<https://openknowledge.fao.org/items/09ed8fec-480e-4432-832c-5b56c672ed92>>. Accessed on: 2 Sep. 2024.

Brazilian Institute of Geography and Statistics (IBGE). **PNAD Contínua** – Pesquisa Nacional por Amostra de Domicílios Contínua – Segurança Alimentar [Continuous PNAD - Continuous National Household Sample Survey - Food Security]. Rio de Janeiro: IBGE, 2023. Available at: <<https://www.ibge.gov.br/estatisticas/sociais/trabalho/17270-pnad-continua.html?edicao=39836&t=resultados>>. Accessed on: 18 Sep. 2024.

Brazilian Institute of Geography and Statistics (IBGE). **Pesquisa Pecuária Municipal [Municipal Livestock Survey]** – PPM. Rio de Janeiro: IBGE, 2022. Available at: <<https://biblioteca.ibge.gov.br/index.php/biblioteca-catalogo?view=detalhes&id=784>>. Accessed on: 13 Sep. 2024.

Brazilian Institute of Geography and Statistics (IBGE). **Censo Agropecuário** [Agricultural and Livestock Farming Census] 2017. Rio de Janeiro: IBGE, 2017. Available at: <<https://censoagro2017.ibge.gov.br/resultados-censo-agro-2017.htm>>. Accessed on: 13 Sep. 2024.

INSTITUTO ESCOLHAS. Os desafios e o potencial da agricultura urbana e periurbana em Belém [The challenges and potential of urban and peri-urban agriculture in Belém].

São Paulo: Instituto Escolhas, 2022. Available at: <<https://agriculturaembelelem.escolhas.org/>>. Accessed on: 8 Sep. 2024.

INSTITUTO ESCOLHAS AND CÁTEDRA JOSUÉ DE CASTRO. Promoção da saúde e a produção de alimentos nas cidades [Health promotion and food production in cities]. **Policy Brief**, n. 7. São Paulo, 2024. Available at: <[https://escolhas.org/wp-content/uploads/2024/04/PolicyBrief\\_7\\_AUP-e-Saude.pdf](https://escolhas.org/wp-content/uploads/2024/04/PolicyBrief_7_AUP-e-Saude.pdf)>. Accessed on: 23 Sep. 2024.

LECK, H. et al. (2015). Tracing the water–energy–food nexus: Description, theory and practice. **Geography Compass**, v. 9, n. 8, p. 445–60. Available at: <<https://compass.onlinelibrary.wiley.com/doi/full/10.1111/gec3.12222>>. Accessed on: 9 Sep. 2024.

LOUZADA, M. L. C. et al. Consumo de alimentos ultraprocessados no Brasil: distribuição e evolução temporal 2008-2018 [Consumption of ultra-processed foods in Brazil: distribution and temporal evolution 2008-2018]. **Revista de Saúde Pública** [Journal of Public Health], v. 57, n. 12, 2023. Available at: <<https://www.scielo.br/rj/rsp/a/4NgBXsYpKjKHyCBJ876P-8F/?format=pdf&lang=pt>>. Accessed on: 12 Sep 2024.

MAPBIOMAS. **Amazônia**: evolução anual da cobertura e uso da terra – 1985-2023 [Amazon - annual assessment of land cover and land use (1985-2022)]. (Infographic). São Paulo: MapBiomas, 2023. Available at: <<https://brasil.mapbiomas.org/wp-content/uploads/sites/4/2023/08/MBI-Infografico-amazonia-8-0-BR-rev4-scaled.jpg>>. Accessed on: 21 Sep. 2024.

MINISTÉRIO DO DESENVOLVIMENTO E ASSISTÊNCIA SOCIAL, FAMÍLIA E COMBATE

À FOME [MINISTRY OF DEVELOPMENT AND SOCIAL ASSISTANCE, FAMILY AND FIGHT AGAINST HUNGER] – MDS. Ordinance No. 966, of 06 March 2024. Defines a non-exhaustive list of foods that can make up the basket of food staples according to the food groups. **Diário Oficial da União** [Federal Official Gazette], Brasília, 2024. Available at: <<https://www.in.gov.br/web/dou/-/portaria-mds-n-966-de-6-de-marco-de-2024-546839622>>. Accessed on: 20 Sep. 2024.

MINISTÉRIO DA SAÚDE/SECRETARIA DE ATENÇÃO À SAÚDE/DEPARTAMENTO DE ATENÇÃO BÁSICA [MINISTRY OF HEALTH/SECRETARIAT OF HEALTH CARE/DEPARTMENT OF PRIMARY CARE]. **Guia alimentar para a população brasileira** [Food guide for the Brazilian population]. Brasília: Ministério da Saúde, 2014. Available at: <[https://bvsm.sau.gov.br/bvs/publicacoes/guia\\_alimentar\\_populacao\\_brasileira\\_2ed.pdf](https://bvsm.sau.gov.br/bvs/publicacoes/guia_alimentar_populacao_brasileira_2ed.pdf)>. Accessed on: 11 Oct. 2024.

MISSELHORN, A.; AGGARWAL, P. K.; ERICKSEN, P.; GREGORY, P. J. A vision for attaining food security. **Current Opinion in Environmental Sustainability**, v. 4, n. 1, p. 7-17, 2012. Available at: <<https://www.sciencedirect.com/science/article/abs/pii/S1877343512000097>>. Accessed on: 9 Sep. 2024.

CARVALHO, C. Monotonia alimentar contribui para perda da biodiversidade mundial [Food monotony contributes to the loss of global biodiversity]. **O Globo** newspaper, 8 Sep. 2023. (Climate and Science Section) Available at: <<https://oglobo.globo.com/mundo/clima-e-ciencia/noticia/2023/09/08/monotonia-alimentar-contribui-para-perda-da-biodiversidade-mundial.ghtml>>. Accessed on: 6 Sep. 2024.

PAGE 22. Notas Amazônicas: comida, cultura e segurança alimentar nas Amazônias [Amazon Notes: food, culture and food security in the Amazônias]. **YouTube**, 6 Jun. 2024. Available at: <[https://www.youtube.com/watch?v=ZfXaO\\_R\\_FPI](https://www.youtube.com/watch?v=ZfXaO_R_FPI)>. Accessed on: 9 Sep. 2024.

REDE PENSSAM - REDE BRASILEIRA DE PESQUISA EM SOBERANIA E SEGURANÇA ALIMENTAR E NUTRICIONAL [BRAZILIAN RESEARCH NETWORK ON FOOD AND NUTRITIONAL SOVEREIGNTY AND SECURITY]. **2º inquérito nacional sobre insegurança alimentar no contexto da pandemia da covid-19 no Brasil** [2nd National Survey on food insecurity in the context of the COVID-19 pandemic in Brazil]. São Paulo: Friedrich Ebert Foundation, 2022.

SANTOS, L. A. et al. Interseções de gênero e raça/cor e insegurança alimentar nos domicílios das diferentes regiões do Brasil [Intersections of gender and race/color and food insecurity in households in different regions of Brazil]. **Cadernos de Saúde Pública** [Public Health handbooks], v. 38, n. 11, e00130422, 2022. Available at: <<https://www.scielo.br/j/csp/a/8n98GjtF49CJzYqhyQR-Cjyk/?format=pdf&lang=pt>>. Accessed on: 16 Sep. 2024.

SEEG – SISTEMA DE ESTIMATIVAS DE EMISSÕES E REMOÇÕES DE GASES DE EFEITO ESTUFA [GREENHOUSE GAS EMISSIONS AND REMOVALS ESTIMATION SYSTEM]. **Análise das emissões de gases de efeito estufa e suas implicações para as metas climáticas do Brasil** [Analysis of greenhouse gas emissions and their implications for Brazil’s climate goals]. São Paulo: SEEG, 2023. Available at: <<1970-2022.https://www.oc.eco.br/wp-content/uploads/2023/03/SEEG-10->

[anos-v4.pdf](#)>. Accessed on: 15 Sep. 2024.

UMA CONCERTAÇÃO PELA AMAZÔNIA [THE AMAZON CONCERTATION]. **Uma agenda pelo desenvolvimento da Amazônia** [An agenda for the development of the Amazon]. [s.l.] The Amazon Concertation, 2021. (Report, 52 f). Available at: <<https://concertacaoamazonia.com.br/estudos/uma-agenda-pelo-desenvolvimento-da-amazonia/>>. Accessed on: 3 Sep. 2024.

WORLD HEALTH ORGANIZATION. **Obesity and overweight**. WHO: Geneva, 2024. Available at: <<https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight#:~:text=In%202022%2C%202.5%20billion%20adults,16%25%20were%20living%20with%20obesity.>>>. Accessed on: 15 Sep 2024.

WORLD ECONOMIC FORUM. **The pathway to a sustainable food system is through human health**. World Economic Forum: Cologne, 2023. Available at: <<https://initiatives.weforum.org/new-frontiers-of-nutrition/home>>. Accessed on: 20 Sep. 2024.

# Annex

Fungi <i>(scientific names)</i>	Description	Illustration
<i>Lentinus crinitus</i> (L.) Fr., 1825	<i>Lentinus crinitus</i> was initially described as <i>Agaricus crinitus</i> L. by Swedish botanist Carl Linnaeus in 1763. In 1825, mycologist Elias Magnus Fries, also Swedish, established the current name, with type locality in Jamaica. The holotype was collected by Irish botanist Patrick Browne in 1756. It is consumed by the Yanomami of the Sanõma group of the Awaris region, Roraima State. Because of its shape, they call these mushrooms Siokoni amo, which means “hairy anus” (Sanuma et al. 2016.) There are also reports of consumption of this species by the Ikpeng (Txicão) peoples reported by Fidalgo and Hirata (1979) in Brazil; Uitoto, Muinane and Andoke in Colombia (Vasco-Palacios et al. 2008); the Hoti people in Venezuela (Zent et al. 2004); the Patamona people in Guyana (Henkel et al. 2004); and the Zapara and Kichwa peoples in Ecuador (Gamboa-Trujillo et al. 2019).	
<i>Cookeina tricholoma</i> (Mont.) Kuntze, 1891	This species was identified by French mycologist Jean Pierre François Camille Montagne in 1834, under the name <i>Peziza tricholoma</i> Mont. Collection was made by French naturalist Charles Gaudichaud-Beaupré, who began a voyage in 1832 aboard the ship L’Herminie, when he visited Brazil, Chile and Peru. Montagne’s publication reports that this fungus was collected from a wooden beam, not far from Rio de Janeiro. The epithet “tricholoma” refers to the ascoma with trichomes or hairs on the edge or margin. There are reports of edibility in Mexico (Villarreal and Pérez-Moreno 1989), by the Bantu and Bagyeli people of Southern Cameroon (Dijk et al. 2003), and in Manus by Komura et al. (2023).	
<i>Tremella fuciformis</i> Berk., 1856	The type locality of <i>Tremella fuciformis</i> is in the present-day Alto Rio Negro Indigenous Territory, in the region of the Ipanoré (Panuré) waterfall and/or community, on the Uaupés River. Samples collected by British naturalist Richard Spruce between September 7, 1852 and March 8, 1853, were studied by British mycologist Miles Joseph Berkeley, and in 1856 it was published as a new species (Berkeley 1856). There have been no changes to the scientific name and samples are stored in the Herbarium at the Royal Botanic Gardens Kew. Consumption of <i>T. fuciformis</i> is reported among the Kichwa people of Ecuador (Gamboa-Trujillo et al. 2019). This white, gelatinous mushroom known as “snow ear”, “white cloud ear”, among other names, is considered both medicinal and edible in Asian countries (Thawthong et al. 2014). In China, it is widely consumed in desserts and ice cream and is cultivated on a large scale.	
<i>Pleurotus djamor</i> (Rumph. ex. Fr.) Boedijn, 1959	This species was collected by Dutch naturalist Georg Eberhard Rumphius as <i>Agaricus djamor</i> Rumph. ex Fr. and described in 1821 by Swedish mycologist Elias Magnus Fries. The current name combination was published by Dutch mycologist Karel Bernard Boedijn in 1959. The type locality of collection was on the island of Amboina/Maluku, currently known as Indonesia. The species, commonly known as salmon mushroom due to the color of the basidiomata, is cultivated worldwide. It is consumed by the Yanomami of the Sanõma group of the Awaris region, Roraima State, and they call these mushrooms Hiwala amo, which means “porcupine” (Sanuma et al. 2016). It is also consumed by the Matsigenka peoples in the Shipetiari region of the Manu Reserve in Peru (Dávila-Arenas et al. 2013) and by the Secoyas and Sionas peoples of the Sucumbios region in Ecuador (Gamboa-Trujillo et al. 2009).	

<p><b><i>Cantharellus guyanensis</i></b> Mont., 1854</p>	<p>The species <i>Cantharellus guyanensis</i> was collected in Guyana by pharmacist and naturalist François Mathias René Leprieur and described in 1854 by mycologist Camille Montagne, both French. In the Central Amazon region, it is common to find this species in areas of Campina and Campinarana vegetation near Macucus trees (<i>Aldina heterophylla</i> Spruce ex. Penth). <i>Cantharellus guyanensis</i> belongs to the genus of the well-known edible species <i>Cantharellus cibarius</i> Fr. Abundant in the Cuieiras River Basin region and in the Rio Negro Sustainable Development Reserve (RDS), Manaus (AM), <i>C. guyanensis</i> is a major attraction for Gastronomic Mycotourism in the region. Molecular analyses of the ITS region of ribosomal DNA from samples collected in the Rio Negro RDS showed 99.5% similarity with the sample of <i>C. guyanensis</i> collected in Guyana.</p>	
<p><b><i>Auricularia fuscosuccinea</i></b> (Mont.) Henn., 1893</p>	<p>Just like <i>A. delicata</i>, <i>A. fuscosuccinea</i> is also called “agouti ear” or “bat ear” by the indigenous peoples of the São Gabriel da Cachoeira region (Amazonas State). This species was scientifically described by French mycologist Camille Montagne in 1842. Its type locality is Cuba. The consumption of <i>A. fuscosuccinea</i> by the Ikpeng (Txicão) and Mebêngôkre (Kayapó) peoples, Mekrâgnoti (Tucarramãe) subgroup, of the Xingu National Park, Mato Grosso State, was reported by Oswaldo Fidalgo and José Massaru Hirata in 1979. In 2002, Aida Vasco-Palacios reported the consumption of <i>A. fuscosuccinea</i> by the Murui-Muinani (Uitoto) people in the Araracuara Region, Colombia.</p>	
<p><b><i>Favolus brasiliensis</i></b> (Fr.) Fr., 1828</p>	<p><i>Favolus brasiliensis</i> fue descrita en 1821 por el micólogo sueco Elias Magnus Fries y nombrada como <i>Daedalea brasiliensis</i>. En 1830, el mismo Fries creó y recombino el nombre en el género Favolus. El epíteto se refiere a la localidad tipo, Brasil. <i>Favolus brasiliensis</i> es llamado Waikasô amo, que significa “pueblo de piel blanca” en la lengua Sanôma (una de las lenguas Yanomami), y es una de las especies más mencionadas en estudios etnomicológicos de la Amazonía (Sanuma et al. 2016). Los champiñones nuevos se preparan inmediatamente después de ser recolectados y tienen un fuerte sabor umami y son tiernos. Sin embargo, los champiñones maduros, si se almacenan deshidratados, se vuelven fibrosos.</p>	
<p><b><i>Auricularia delicata</i></b> (Mont. ex Fr.) Henn., 1893</p>	<p>Because it resembles an ear, both the scientific name and many popular names used by various peoples refer to that auditory organ - from the Latin <i>auricula</i>. In the region of the Brazilian Amazon known as Cabeça do Cachorro (Dog’s Head), in the municipality of São Gabriel da Cachoeira (Amazonas State), <i>A. delicata</i> is consumed and known as “agouti ear” or “bat ear”. There are records of consumption by the Uitoto, Muinane and Andoke peoples of Colombia and the Hoti in Venezuela (Vasco-Palacios et al. 2008; Zent et al. 2004). Historical records indicate that species of the genus <i>Auricularia</i> were the first to be intentionally cultivated by humans, around the year 600 CE in China (Bertelsen, 2013). It is currently one of the five most cultivated genera in the world.</p>	
<p><b><i>Cookeina speciosa</i></b> (Fr.) Dennis, 1994</p>	<p>It was first described as <i>Peziza speciosa</i> Fr. by Swedish mycologist Elias Magnus Fries in 1822. The new name combination was made by English mycologist Richard William George Dennis in 1994. This species is often mistaken for <i>Cookeina sulcipes</i> (Berk.) Kuntze and <i>C. tricholoma</i> (Mont.) Kuntze, which have different microscopic characteristics (Hermawan et al. 2022). There are reports of edibility in Mexico (Guzmán and Piepenbring 2010) and by the Ngäbe and Buglé peoples in Panama (De León 2022). The epithet “speciosa” comes from Latin and refers to the ascoma with a pompous, elegant, colorful or simply beautiful shape. <i>Cookeina speciosa</i> is characterized by the presence of three rows of hairs on the margin and microscopically by the ornamentation of the spore (Ortega-López et al. 2019).</p>	
<p><b><i>Oudemansiella platensis</i></b> (Speg.) Speg., 1881</p>	<p><i>Oudemansiella platensis</i> (Speg.) Speg. is the first species of this genus described in 1880 by Italian-Argentine mycologist Carlos Luis Spegazzini. The name of the genus was a tribute to botany professor Dr. C. Oudemans, for his contributions in the fields of botany and mycology in the Netherlands. The epithet “platensis” is in honor of the Rio de la Plata, due to the original collection made by Spegazzini himself, carried out near this river in Argentina (Spegazzini, 1881). In 1838, Franciscus Junghuhn described the species <i>Agaricus canarii</i> from the island of Java, Indonesia, found on living branches of <i>Canarium communis</i> L. In 1909, the species was recombined as <i>Oudemansiella canarii</i>. In 2008, in an extensive survey led by the American mycologist Ronald H. Petersen, a neotype was defined for <i>O. canarii</i> (Java) and an epitype for <i>O. platensis</i> (Argentina). <i>O. canarii</i> is often cited as an edible mushroom species, we believe that the literature reporting <i>O. canarii</i> for the Amazon actually refers to <i>O. platensis</i>.</p>	

---

P9659

*Proposals for the Amazônia*: an Integrated Approach to the  
Development Agenda / organized by the Amazon Concertation.  
– São Paulo: Arapyaú, 2024.  
160 p.; il.

ISBN: 978-65-983363-4-9

1. Amazônia. 2. Environment. 3. Integrated Approach. 4. Sustainable  
Development. 5. Connections. 6. Environmental Protection. 7. Climate  
Change. 9. Public Policy. I. Title. II. The Amazon Concertation.

CDU 502.13

---

Librarian: Tatiane de Oliveira Dias – CRB1/2230

How to cite the source:

THE AMAZON CONCERTATION (ORG.). *Proposals for the Amazônia*: an Integrated  
Approach to the Development Agenda. São Paulo: Arapyaú, 2024.



AMAZON  
CONCERTATION