



SUMMARY OF THE INTERNATIONAL SEMINAR ON THE AMAZON AND TROPICAL FORESTS

RESEARCH AND INNOVATION WORKING GROUP – RIWG G20

The International Seminar on the Amazon and Tropical Forests took place between September 17th and 18th, 2024, in Manaus/AM, at the National Institute for Amazon Research (INPA), a research unit of the Ministry of Science, Technology and Innovation (MCTI), in parallel with the meeting of the G20 Research and Innovation Working Group (RIWG).

The Seminar was attended by the following authorities at its Opening Ceremony:

- a. Henrique Pereira, Director of INPA;
- b. Osvaldo Moraes, Director of Climate and Sustainability at MCTI;
- c. Ima Vieira, former Director of the Emílio Goeldi Museum of Pará (MPEG) and Advisor to the Presidency of the Funding Agency for Studies and Projects (Finep);
- d. Igor Bahia Costa, Superintendent of the Manaus Free Trade Zone (SUFRAMA);
- e. Vanessa Graziotin, Executive Director of the Amazon Cooperation Treaty Organization (ACTO);
- f. Ezra Clark, Chief of the Science, Technology and Innovation Policy Section of the United Nations Educational, Scientific and Cultural Organization (UNESCO); and
- g. Guila Calheiros, Director of Planning and Management at the Brazilian Company for Industrial Research and Innovation (Embrapii).

After the opening, the presentations of panelists from various national and international institutions with global relevance began. In total, there were six panels:

1. Decarbonization and Climate Change;

2. Traditional Knowledge and Diversity in Science, Technology and Innovation;
3. Biological Diversity, Conservation Units and Biosphere Reserves;
4. Open Innovation and International Cooperation in Science, Technology and Innovation;
5. Bioeconomy; and
6. Academic Cooperation.

The first panel, on **Decarbonization and Climate Change** , was moderated by a representative of the Food and Agriculture Organization of the United Nations (FAO) and panelists from:

- the Forestry and Forest Products Research Institute of Japan (FFPRI);
- the European Forest Fire Information System (EFFIS) and the Global Forest Fire Information System (GWIS);
- the National Institute for Amazon Research (INPA) and the State University of Campinas (Unicamp); and
- the Intergovernmental Panel on Climate Change (IPCC).

In this panel, the discussion focused on the role and interaction between forests and climate change, especially when considering their relevance as a carbon stock, their biodiversity and their regulation of various cycles, such as water and heat in the atmosphere. Some aspects that were highlighted were:

- i. the danger of the Amazon's point of no return;
- ii. the need to combat actions that promote deforestation;
- iii. controlling and fighting forest fires;
- iv. the structuring of forest management activities that not only prevent the loss of biodiversity but also promote the regeneration of degraded areas;
- v. the need to break the vicious cycle where forest degradation triggers more deforestation and, consequently, more extreme weather events, such as severe droughts and floods;
- vi. the need for a scientific basis for decision-making, taking as an example the AmazonFACE and Torre ATTO projects, from MCTI; and

- vii. the urgency of concrete actions to tackle the climate emergency and the failure to achieve a 1.5°C increase in the average global temperature, based on the average temperatures of the period prior to the Industrial Revolution.

In turn, the second panel, focused on **Traditional Knowledge and Diversity in Science, Technology and Innovation**, it was moderated by a representative from the Federal University of Amazonas (UFAM) and featured panelists from:

- the World Resources Institute (WRI);
- the University of the Andes; and
- the Center for Research and Promotion of the Peasantry (CIPCA).

The guiding principle of this panel was the existing debate about the need for integration between traditional knowledge and modern Science, Technology and Innovation in a fair, equitable and participatory manner with the aim of reducing asymmetries and inequalities through the development and promotion of coordinated and appropriate public policies. There were highlighted aspects such as:

- i. the guarantee of equitable collaboration between the National Science, Technology and Innovation Systems and indigenous peoples and traditional communities in the fair co-production of knowledge that has the foundation of that knowledge in traditionally occupied territories;
- ii. the role of the diverse knowledge of indigenous peoples as strategies of local public policies for safeguarding the Amazon, highlighting the strong association between traditional knowledge, the guarantee of territorial rights and the protection of the forest;
- iii. the need for concrete climate actions that include the territorial rights of indigenous peoples, their self-determination and financial compensation for environmental services, reinforcing the need to formulate public policies based on local demands;

- iv. the sociocultural diversity of the Amazon promotes different types of innovation, not only related to the creation of new products, but also related to forms of territorial management and conflict management; and
- v. the existence of vast knowledge among indigenous peoples and traditional communities about their territory and local food production, there being, however, a need for scientific and technological contributions aimed at these territories to enhance current forms of use and provide greater empowerment.

In the third panel, on **Biological Diversity, Conservation Units and Biosphere Reserves**, the moderation was carried out by a representative of Global Biodiversity Information Facility (GBIF) and featured panelists from the following institutions:

- University of Salento ;
- Federal University of Minas Gerais (UFMG);
- Norwegian University of Life Sciences; and
- Unesco.

The panel addressed the importance of biodiversity and its conservation and understanding, including the need to obtain, process, store and share qualified information about this same biodiversity. There were highlighted aspects such as:

- i. the importance of biodiversity data and the need to garner support and funding at international, national and local levels to improve human capacities and computing infrastructure to ensure the capture, processing, cataloguing, harmonisation, storage and sharing of quality information about biodiversity and its uses;
- ii. the need for integration and coordination of the various initiatives that aim the understanding of the biodiversity, recognizing its impacts and reinforcing the collaboration of the global infrastructure for improving knowledge and monitoring;

- iii. the importance of developing a robust computational infrastructure for developing models in forestry studies, the impact of carbon sequestration and studies of the impact of global warming on terrestrial and aquatic organisms;
- iv. the need for local, national and global efforts to address the challenge posed by mega biodiversity and the complexity of ecosystem services in the Amazon basin, considering existing knowledge gaps as well as the various initiatives proposed to protect this region;
- v. the existing knowledge gaps at the taxonomic, evolutionary, biogeographic and species interaction levels prevent more realistic estimates of Amazonian biodiversity as well as the recognition of biogeographic patterns, preventing the implementation of more efficient management;
- vi. reinforcing the importance of initiatives such as the Franco-Brazilian Center for Amazonian Biodiversity, with the aim of developing studies that integrate the entire region, filling knowledge gaps, promoting knowledge syntheses and empowering actors with education and social justice. It is worth noting that there is the possibility of this Center counting on the possible participation of other Amazonian countries; and
- vii. The sustainable use of this biodiversity is only possible with in-depth knowledge of it. To this end, the traditional knowledge of indigenous peoples and traditional communities is essential and efforts are needed to enhance this knowledge and use it to conserve biodiversity and the biome and to establish and strengthen value chains.

In turn, the fourth panel had as its theme **Open Innovation and International Cooperation in Science, Technology and Innovation** , with moderation by a representative of the Amazonas State Research Support Foundation (FAPEAM), and panelists from the following institutions:

- National Institute for Space Research (INPE);
- Amazon Biobusiness Center (CBA);
- Finep; and

- Embrapii .

This panel's guiding principle was the application of the concept of open innovation in international cooperation with a focus on the preservation and sustainable management of tropical forests, addressing aspects such as:

- i. the use of open innovation in international cooperation from the perspective of the digital economy and its relationship with the public good (non-rival and non-excludable), raising the critical issue of financing for its implementation. After all, it is necessary to know who and how this open innovation will be paid for public goods and benefits;
- ii. the understanding that the success of open innovation in complex technological environments depends on having clear, long-term objectives, promoting the effective participation of all actors;
- iii. the complexity of economic development with the increase of the available resources that demand greater articulation, moving from horizontalization to more assertive verticalization, involves the development of new collaborative arrangements capable of increasing competitiveness;
- iv. the importance of understanding that the expansion of internal capacity, since what happens in a biome is not restricted to that biome, requires broad coordination. In this sense, Open Innovation must stimulate international cooperation that develops in an equitable and productive way, considering new business and financing models, such as those presented by the innovation promotion agencies Finep and Embrapii , responsible for the integration among the academy, companies and society.

As for the fifth panel, it addressed the **Bioeconomy** , and was moderated by a representative from the Brazilian Agricultural Research Corporation (Embrapa) and panelists from the following institutions:]

- INPA;
- Franco-Brazilian Center for Amazonian Biodiversity;
- Mamirauá Institute for Sustainable Development (IDSM); and

- National Center for Research in Energy and Materials (CNPEM).

The guiding principle of this panel was the discussion of fundamental principles that integrate the rights of the peoples of the Amazon into research, prioritizing socio-biodiversity and economic justice, highlighting the importance of meeting the regional demands of family farmers, traditional communities and indigenous peoples, ensuring a fair distribution of economic benefits and avoiding the concentration of wealth. The following aspects were addressed:

- i. recognition of the vital role of traditional communities and indigenous peoples in conservation and sustainable bioeconomy, combating the marginalization of these peoples and communities in discussions on economic development and promoting inclusion that values their traditional knowledge and practices;
- ii. the bioeconomy must respect collective and individual rights, avoiding undue appropriation of knowledge and promoting the conservation of ecosystems, always respecting the cultural and social specificities of the Amazonian populations;
- iii. understanding the complexity of the bioeconomy and the risks of using the term inappropriately, which could lead to a process of "greenwashing" of unsustainable actions. The bioeconomy should not be limited to being an economic sector without social and environmental improvements;
- iv. the importance of participatory management in the bioeconomy is essential for sustainable development in the Amazon and in the creation, promotion and valorization of value chains, implementing local involvement and the development of public policies that guarantee fair prices;
- v. the bioeconomy proves to be an important mean of overcoming the fragmentation of knowledge, highlighting the need for integrated approaches capable of promoting actions to achieve the Sustainable Development Goals (SDGs);

- vi. the bioeconomy must promote innovative solutions to address climate change and biodiversity conservation, promoting inclusive growth through the integrated use of traditional knowledge and practices with the most modern tools of Science, Technology and Innovation, with one example being the use of synthetic biology for the development of enzymes from biodiversity.

Finally, the sixth and final panel addressed Academic Cooperation, moderated by a representative of the Belmont Forum and featuring panelists from the following institutions:

- Amazon Institute for Scientific Research (SINCHI);
- National Council for Scientific and Technological Development (CNPq);
- University of Basel;
- Foundation for the Coordination for the Improvement of Higher Education Personnel (CAPES).

As a guiding axis, this panel discussed experiences regarding academic cooperation that promotes sustainable development in the Amazon region, involving aspects such as:

- i. the need to strengthen national and international research networks;
- ii. the recomposition and increase of financing;
- iii. the creation of new research promotion programs and research networks, effectively contributing to the reduction of regional asymmetries and the concentration of researchers in other regions; and
- iv. Despite the importance of the Amazon, this has not translated into an increase in regional and international cooperation, given the asymmetries between potential cooperators, which are extremely diverse. Solutions to this problem are the subject of great debate and require greater attention from decision-makers and public policymakers.