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POLICY BRIEF

Science for the Forest COP

For a scientific, digital, and societal alliance
between the three tropical basins

Policy Brief co-authored by researchers specializing in the Amazon and Congo basins, during the Iaraçu Scientific River Expedition, en route to the COP, Belém (2025):

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1. Tropical forests and wetlands: a global and human challenge

COP30, held in Belém in the heart of the Amazon, places forests, biodiversity, and indigenous peoples and local communities at the center of mitigation and resilience issues.

The three major forest basins — **the Amazon, Congo, and Southeast Asia-Papua** — contain the largest share of biodiversity and terrestrial carbon sinks. In these three basins, dryland rainforests and forest wetlands form a mosaic of ecosystems that have been inhabited for thousands of years. Their fate determines that of the climate, hydrological stability, and the well-being of hundreds of millions of people from the local to the global scale.

However, warning signs about the dramatic state of forests are accumulating as advances in scientific and technical knowledge accumulate:

- The essential role of forests as carbon sinks is diminishing;
- Biomass losses linked to changes in ecosystem functioning due to climate change and local degradation (deforestation on areas smaller than 1 ha) account for a very significant proportion of forest carbon emissions (more than 35%). These losses, which were previously difficult to observe, also affect certain protected areas;
- Ecological tipping points are approaching, particularly in the Amazon.

Researchers from various disciplines have joined forces in the **Iaraçu Scientific Caravan**, currently sailing to Belém. The issues and perspectives highlighted during this caravan and shared by the three basins revolve around:

- the low value placed on ecosystem services (carbon, water, biodiversity, health) and insufficient funding for forest guardian communities;
- contradictory international pressures: extractive development versus conservation;
- increasing pollution and the rise in disease vectors as large cities approach;
- opportunities offered by technological innovation: satellite monitoring, participatory inventories, sustainable value chains, widespread internet access, advances in AI;
- a genuine desire among some of the communities encountered to preserve their environment while ensuring a decent income.

The caravan's destination is the Federal University of Pará (UFPA), to highlight the importance of cooperation with universities based in the heart of the rainforest. UFPA is the largest university in the Brazilian Amazon. With 50,000 students, it trains students from the riverbanks and inland areas of Pará. Such universities are the virtuous "pioneering fronts" for training future researchers and managers, in direct contact with the territory.

At the end of the caravan, we want to reaffirm our conviction: **scientific knowledge, public policy, civil society, the private sector, and local knowledge holders must come together through international collaboration rooted in the territories.**

The **knowledge of Indigenous Peoples and other Local Communities (PACL)** provides a basis for dialogue on the sustainable management of resources and the conservation of territories, forests, and wetlands, and for adapting their management in the face of climate change. **Environmental archaeology, anthropology, and sociology** offer valuable lessons: many populations have known and still know **how to live and cultivate in tropical forests and peatlands** without destroying them, maintaining a balance between production and preservation.



Several inclusive conservation mechanisms are proposed with the aim of reconciling development and conservation, and ensuring social and environmental justice. Payments for Environmental Services (PES) are incentive mechanisms that reward ecosystem preservation. The **Tropical Forests Forever Facility (TFFF)**, which will be negotiated at COP30, is part of this approach, aiming to establish a **global fund of recurring payments** to tropical countries for the conservation of their forests. **Nature-based Solutions (NbS)** offer a more integrated approach, mobilizing the restoration, sustainable management, and protection of natural environments to simultaneously address the challenges of climate, biodiversity, and development. NbS are not just a matter of modern science: they continue a long history of co-evolution between human societies and ecosystems. They are based on **co-construction** with all **public, private, and civil society** actors to ensure the legitimacy, sustainability, and local ownership of initiatives.

These dynamics must be accompanied by the development of **sustainable and equitable value chains**, ensuring that the economic benefits derived from natural resources are **fairly distributed** and contribute to strengthening the **socio-ecological resilience of territories**.

These solutions will only be possible if **reliable, locally controlled data** are available **that integrates ecological and social dimensions** reflecting the diversity of socio-ecosystems, including:

- the **structure and diversity of forests**;
- the **services provided** (e.g., for the water cycle and climate);
- and **management practices**, particularly those based on traditional and local knowledge.

2. Vision : data as the foundation for equitable governance and a prerequisite for action

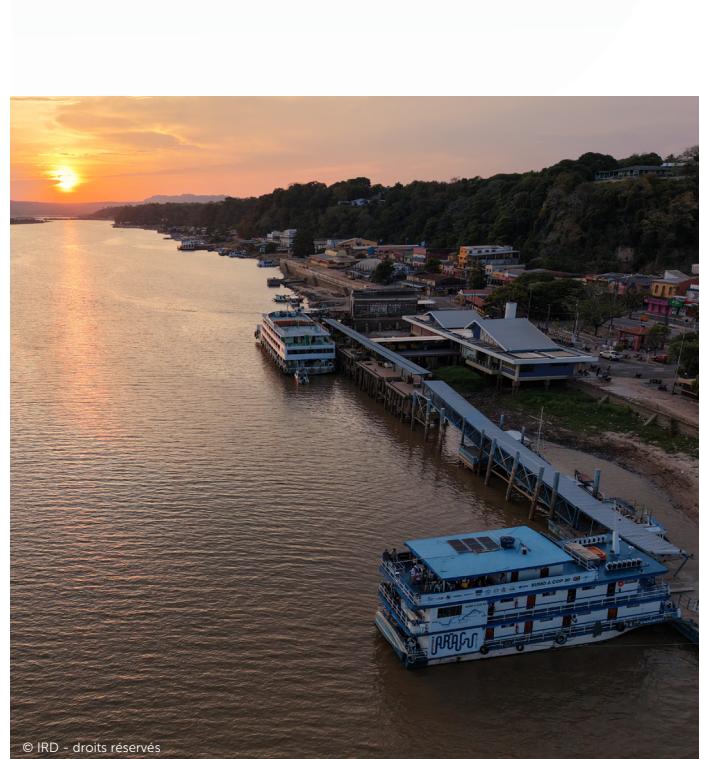
The climate and biodiversity crises require all countries to be able to **appropriate scientific knowledge** to complement indigenous knowledge in order to understand and govern their natural resources.

This requires:

- **scientific autonomy**, enabling researchers to produce, interpret, and publish their data, ensuring **greater equity in the recognition and funding** of local research and innovation.
- **sovereign control of data and its interoperability with public international data-sharing infrastructures**. In this context, it is particularly necessary to guarantee access to primary data for monitoring deforestation and forest degradation, as well as changes in forest biomass stocks;
- strengthening training, including **higher education, as close as possible to forest areas**;
- **discussion of scientific knowledge** by stakeholders in the territories.

Global challenges require a **federation of scientific initiatives**, bringing together the three major tropical forest basins. This integration must include ecological, health, socio-cultural, and economic dimensions to enable the implementation of integrated action policies tailored to the specific characteristics of each region. It must also promote **the harmonization of approaches and protocols**, which is essential for **comparing dynamics, strengthening scientific credibility, and accelerating cross-learning**.

By creating a common framework capable of taking local specificities into account, this cooperation will enable **the exchange of expertise between forest countries, accelerate technological and methodological innovation, and pool best practices** in order to share proven and replicable solutions for forest protection and sustainable development.



3. Strengthen observation and open data at all levels

While space observation has revolutionized our understanding of forests, without ground-based data, it remains very incomplete. It is **essential to establish integrated measurement capabilities in the field, covering all disciplines of life sciences, Earth sciences, climate, societies, and health.**

The Congo Basin Forest Pact, co-sponsored by France and bringing together all stakeholders (Central African states, local and international research, civil society, businesses, and donors) and will be announced during the COP, has agreed that **at least 10% of the financial resources** allocated to forests (via a new Pledge or a mechanism such as the TFFF) should support research and academic training in forest countries.

We call for the creation or revitalization of a **network of trans-disciplinary observatories**, representative of anthropization gradients (to also understand degraded environments and the different management methods that are becoming increasingly prevalent in forest areas), linking:

- ecological, hydrological, and climatic stations,
- biodiversity and environmental health monitoring networks,
- socio-economic and cultural observatories.

These observatories should be linked to regional forest and wetland Living Labs to co-develop innovative solutions based on academic and local expertise.

Public Data Infrastructures (DPDs) at the UN level are also essential for the effective implementation of public policies. They guarantee sovereignty while enabling openness and international collaboration.

In Brazil, for example, the Prodes and Deter digital infrastructures have made it possible to use scientific data from the Brazilian National Institute for Space Research (INPE) to effectively control deforestation, which has fallen by 11% without any change in legislation. In Gabon, as part of the Nzoya Data project ("the house of data" in Kikongo), Gabonese stakeholders and the One Forest Vision initiative have highlighted that such infrastructure is essential for the reuse of scientific data for action: so that a logger can contribute to forest inventories, a farmer can report human-wildlife conflicts, a Gabonese public official can produce reliable climate change monitoring reports and propose relevant protected areas, etc. It is now necessary to interconnect national infrastructures and connect them to international platforms.

4. Operational recommendations

1. **Allocate at least 10% of climate and forest funds to research and academic training** in forest countries. **Revive ground observation networks**, integrating ecology, climate, health, and societies. **Support researchers and field assistants** financially, through capacity building and FAIR science that recognizes their contribution and expertise. **Integrate traditional knowledge** into adaptation strategies and nature-based solutions.
2. **Ensure open data, sovereignty, and international collaboration** through urbanized, efficient, and ethical public national, regional, and international data-sharing infrastructures..
3. **Strengthen "Three Basins" cooperation** through joint programs, from research to training..
4. **Gradually implement conservation, PES, and sustainable development mechanisms** that take into account the local context (socio-biodiversity, carbon).
5. **Make Indigenous Peoples and other Local Communities key players** who mobilize their knowledge and direct beneficiaries of financial mechanisms that recognize their efforts.

5. Conclusion – Belém, a positive tipping point

Belém offers a historic opportunity to unite the voices of researchers, local decision-makers, and forest peoples. The tools and knowledge exist; digital and human networks need to be built. What is needed now is **the political will to integrate this**

data into decisions and implementation, for equitable, informed, and nature-based forest governance. **Belém must be the COP where science, combined with local knowledge, becomes the foundation for global forest diplomacy and action.**