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The Amazon is a biodiverse and culturally rich territory, but it faces challenges related to inequality in the distribution of resources for science and the low representation of its populations in political debates.

Introduction

There is a consensus among researchers that the Amazon is one of the most biodiverse regions on the planet and plays an essential role in regulating the global climate. Although there are dissenting voices, these are generally devoid of scientific basis and sound like “flat-earthism” to researchers. So much so that this subject is a central theme

tral in international debates, such as the **Conferences of the Parties**

(COPs) of the United Nations Climate Change Organization. In this context, indigenous peoples and traditional communities of

Amazon are recognized for playing an essential role in the maintenance and preservation of the forest. Paradoxically, **these communities** are also directly and indirectly the most

impacted by deforestation, environmental degradation and

extreme events intensified climate change. Despite this, their voices continue to be undervalued in the formulation of public policies. This situation is aggravated by the disproportionately low allocation of resources for science in the Amazon in relation to its importance and vast area.

This resource, already scarce, is still poorly distributed, concentrated in a few centers and regions. This imbalance hinders the generation and dissemination of knowledge in the various “Amazons” — plural in cultural, ethnic and biological terms — and compromises the formulation of effective socio-environmental policies.

This document highlights the importance of importance of Amazonian voices (researchers, indigenous peoples and local traditional communities) in the formulation of policies that integrate scientific knowledge and

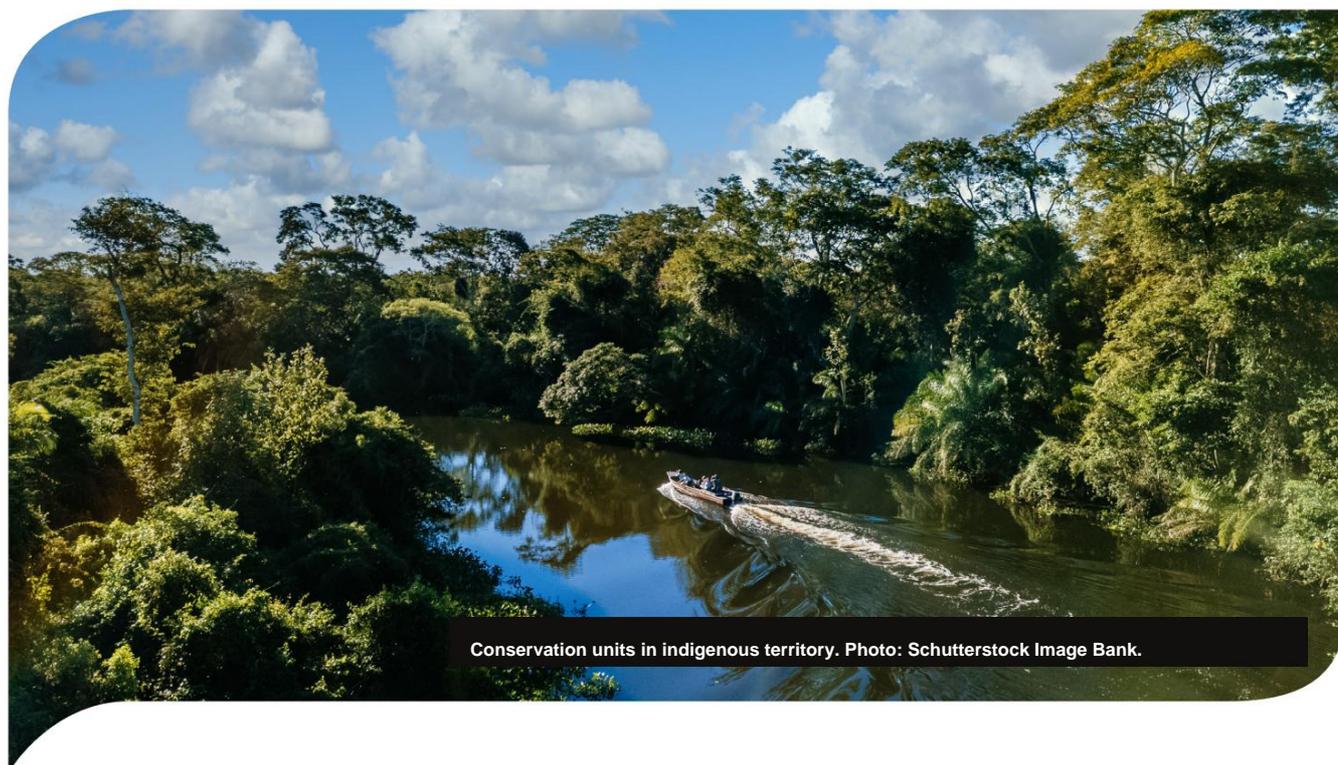
local knowledge. By valuing these skills, zes, we strengthen environmental and territorial governance, drive **sustainability and biodiversity conservation** , and promote more equitable and efficient management of the Amazon's resources.

The proposed solutions transcend the conservation of the biome, simultaneously promoting sustainable development and social justice. They recognize the profound interdependence between biodiversity, culture, ethnicities and ways of life of the Amazonian populations, which should never be dissociated.

Proposed Solutions

1. Strengthening territories and conservation units

Indigenous territories (TIs) and **conservation units (UCs)** are essential for maintaining



Conservation units in indigenous territory. Photo: Shutterstock Image Bank.

biodiversity and carbon sequestration, storing around 42 billion tons of CO₂, which is equivalent to 58% of the region's carbon. In addition, approximately **80% of the rainfall that sustains agriculture depends on the integrity of these areas**. However, environmental protection and monitoring policies are insufficient to contain illegal activities, such as mining and illegal logging. This poses major challenges for traditional communities in defending their territories, which should have more effective governance and a robust monitoring system. Therefore, expanding studies on TIs and UCs at the municipal level

national, state and federal levels is important to deepen knowledge of biodiversity and ecosystem processes, providing support for more efficient territorial management and more effective public policies.

2. Expansion of collaborative research networks

The creation of a collaborative research network, integrating the **Biodiversity Research Program (PPBio)**, the **Long-Term Research Program (PELD)** and the National Institutes of Science and Technology (INCTs) located in the Amazon, especially the INCTs **CENBAM** and **SINBIAM**, is fundamental to strengthen the production of knowledge and guide public policies in the region. However, only **10% of the federal budget is allocated to the Amazon**, with the majority concentrated in Manaus and Belém. This scenario leads to underfunding.

financing and underutilization of available infrastructure and the intellectual capacity installed in the interior (equipment, human resources), including that in federal institutes, research bodies and universities. This centralization compromises the training and retention of human resources, resulting in a lack of information about other regions of the Amazon, which inhibits or delays scientific advances and directly impacts sustainability and regional development.

Decentralizing investments would allow for the development and implementation of more comprehensive and effective conservation strategies, both for biodiversity and for territories, contributing to improving the quality of life of the Amazonian peoples. Furthermore, research networks value Amazonian researchers and institutions, providing them with the opportunity to take the lead and valuing the science produced in the biome, avoiding them being treated as inferior.

pink data collectors.

3. Sustainable development and innovation

The decentralization of investments and the creation of national and international funds for research in the Amazon are essential to strengthen science, innovation and the bioeconomy in the region, highlighting:

Creation of governance mechanisms that integrate scientific knowledge and traditional knowledge in local development;

Implementation of public policies based on the demands of traditional communities and the poor.

native peoples, promoting environmental preservation, the development of the bioeconomy and social justice;

Training and retention of professionals to work in research and technological innovation aimed at maintaining biodiversity and ways of life in the Amazon;

Investments in infrastructure infrastructure and equipment to strengthen multi-user research networks, optimizing costs and expanding knowledge production. In addition, resources are needed to recover existing infrastructure and equipment that have depreciated in recent years.

Feasibility and Benefits

Feasibility

Integrated governance between public and private institutions and traditional communities faces structural challenges, but can be made viable through the expansion of collaborative research networks and the decentralization of resources.

More inclusive research projects and public policies are also essential to make this governance more efficient and democratic to ensure that solutions meet the size, diversity of peoples and challenges of the Amazon.

Benefits and Impacts

Integration between scientists and traditional peoples generates significant benefits for conservation and sustainable development in the Amazon. In the environmental field, this integration should contribute to

reducing deforestation, increasing knowledge about the use and protection of biodiversity, and mitigating climate change through the preservation and sustainable use of forests. In the social sphere, this integration strengthens traditional knowledge and empowers indigenous, quilombola, and riverside communities, contributing to a more autonomous management of their territories. Economically, it boosts sustainable production chains, encourages ecotourism, and fosters the bioeconomy, especially with non-timber forest products, such as cupuaçu and Brazil nuts. In addition, it paves the way for the discovery and use of new foods or forest products, such as Yanomami mushrooms and various vegetables used by indigenous peoples but not yet present in the general diet.

Next Steps

In the coming years, it will be essential to implement some essential actions to consolidate these advances. Among them, the implementation of the Integrated Center for Sociobiodiversity in the Amazon (CISAM) and the expansion of collaborative networks, scientific dissemination platforms and data repositories on biodiversity, culture and other regional aspects stand out.

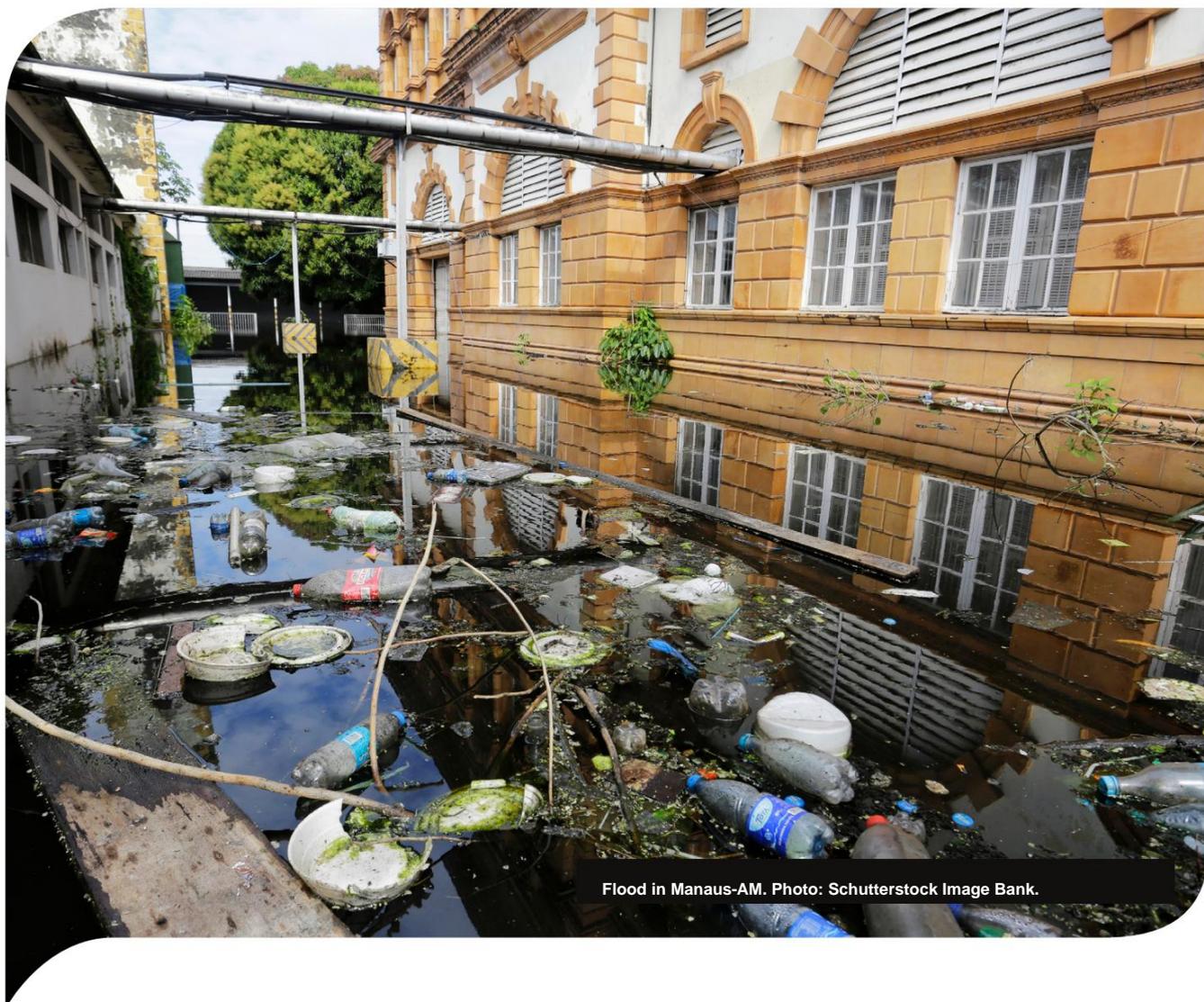
Furthermore, the creation and unification of research protocols will be crucial to expanding connectivity between existing projects, favoring the generation and comparison of information in different regions of the Amazon.

Conclusion

The Amazon is a territory complex and dynamic, with extreme biological and cultural variability, requiring sustainable strategies that integrate science, community participation and environmental governance. The proposals presented here highlight the need for structural investments, decentralization of resources and strengthening of research networks as pillars for the

conservation, sustainable development and regional integration.

Collaboration between scientists, traditional communities, policymakers and the private sector is necessary to ensure that the voices of Amazonians are heard and respected, promoting effective actions not only for the people of the region, but also for the world.



Flood in Manaus-AM. Photo: Schutterstock Image Bank.

WANT TO KNOW A LITTLE MORE?

See:

da Silva, EC, Guerrero-Moreno, MA, Oliveira, FA *et al.* The importance of traditional communities in biodiversity conservation. *Biodivers Conserv* 34, 685–714 (2025). <https://doi.org/10.1007/s10531-024-02999-3>

Guimaraes, AF, De Alagao Querido, LC, Rocha, T., De Jesus Rodrigues, ... Magnusson, WE (2024). Disentangling the veil line for Brazilian biodiversity: An overview from two long-term research programs reveals huge gaps in ecological data reporting. *Science of The Total Environment*, 950, 174880. <https://doi.org/10.1016/j.scitotenv.2024.174880>

Carvalho, RL, Resende, AF, Barlow, J., França, FM, Moura, MR, Maciel, R., Alves-Martins, F., Shutt, J., Nunes, CA, Elias, F., Silveira, JM, Stegmann, L., Bac-caro, FB, Juen, L., Schietti, J., Aragão, L., Berenguer, E., Castello, L., Costa, FR, . . . Ferreira, J. (2023). Pervasive gaps in Amazonian ecological research. *Current Biology*, 33(16), 3495-3504.e4. <https://doi.org/10.1016/j.cub.2023.06.077>

Stegmann, LF, França, FM, Carvalho, RL, Barlow, J., Berenguer, E., Castello, L., Juen, L., Baccaro, FB, Vieira, ICG, Nunes, CA, Oliveira, R., Venticinque, EM, Schietti, J., & Ferreira, J. (2024). Brazilian public funding for biodiversity research in the Amazon. *Perspectives in Ecology and Conservation*, 22(1), 17. <https://doi.org/10.1016/j.pecon.2024.01.003>

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