



Amazonia at the Crossroads: *Setting the Agenda for International Transdisciplinary Research of Consequence*

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In collaboration with the Belmont Forum,
Interamerican Institute for Global Change Research,
São Paulo Research Foundation (FAPESP), and the
Smithsonian Institute (USA).

Workshop Findings

On January 17, 2023, twenty-seven scientists, advocates, and policy leaders from throughout the Amazon River Basin gathered in Front Royal, Virginia, for an all-day Workshop focused on the future of transdisciplinary research in the region. Participants hailed from Brazil, Bolivia, Peru, Colombia, Venezuela, and the United States, and represented academic disciplines as varied as conservation biology, anthropology, environmental economics, education, botany, political science, geography, geochemistry, and climate science. In addition to academic leaders—including several members from various national academies of science—the Workshop convened funding agencies, NGOs, and multilateral banks.

Here we summarize the proceedings of the Workshop. The organizers hope that our findings will help inform the development of a transnational call for transdisciplinary research of consequence focused on the most urgent research-to-action priorities in the greater Amazonian region. The Belmont Forum is currently developing a “Collaborative Research Action” call, under the leadership of the São Paulo Research Foundation and the Interamerican Institute for Global Change Research, along just these lines.

The workshop’s overarching **goals** were as follows:

- 1) Stimulate thinking and collaborations to address the most urgent research problems in Amazonia today. What are the most important questions and themes for research?
- 2) Articulate a set of principles to guide future transdisciplinary and international research of consequence that directly addresses such a research agenda (#1).

To achieve these goals, we utilized a mixed methods format. First, we heard from five noted transdisciplinary scholars, who presented models for addressing complex questions through a collaborative and applied research lens. With these models in mind, discussions in break-out groups then focused on 1) identifying research priorities in Amazonia; 2) brainstorming gaps and possibilities in both the funding and research governance landscapes; and 3) designing equitable research and programs in the region. Finally, in the spirit of creating an equitable and inclusive environment for discussion, Workshop participants recognized the fundamental

importance of following the leadership of Amazonian communities, Amazon-based researchers, and research agencies located in the Global South. To paraphrase participant Ane Alencar, our focus was on “how can science support diversity in Amazonia?” This question requires close attention to how research is funded, circulates, and resonates with local socio-political and epistemological conditions.

Defining “transdisciplinary and international research of consequence.”

An important term of art emerged from our discussions as well as broad consensus that the challenges facing Amazonia are both so urgent and so complex that only “transdisciplinary and international research of consequence” is suitable to address them. Transdisciplinarity entails designing research so that methods and analysis is informed by a variety of scientific and epistemological traditions so that greater understanding might be achieved. Amazonia is home to nine sovereign nation-states, and its biodiversity, ecosystem services, freshwater, and carbon stocks are of global importance. Ambitious scientific questions pertaining to the region must be undertaken from an international perspective, with the appropriate leadership of academic institutions, governments, industry, and third-sector actors from within Amazonian countries. Finally, “research of consequence” refers to research that intervenes in complex problems, which refuses the artificial distinction between “pure” and “applied” research, and which engages local communities in an inclusive, ethical, and responsible manner.

Case Studies: Models for Thinking

Five distinguished scholars presented their own recent projects, all of which are good examples of “transdisciplinary and international research of consequence.” Prior to the Workshop, participants also [reviewed other recent examples](#), such as the [Science Panel for the Amazon](#).

- Adalberto Val (INPA): “AmIT (Amazon Institute of Technology): An ambitious and innovative project for a sustainable Amazon.” Goal of AMIT: to “transform scientific and traditional knowledge into technological innovation through the formation of networks, in partnership with local actors, for social inclusion, economic development, and conservation of Amazonia’s standing forests and flowing rivers.”
- Simone Athayde (FIU): “Transboundary Governance and the Conservation of Biocultural Riverscapes in the Amazon.” This collaborative trans-boundary (Brazil/Peru/Colombia) research project focuses on an overlooked but crucial component of Amazonia: freshwater eco-corridors, which have enormous potential for sustainable resource management (fish, trees, etc.) and international conservation corridors.
- David Luther (GMU): “Predicted Effects of Land Use and Climate Changes on Amazonian Biodiversity.” Often thought of as distinct problems, biodiversity loss and climate change are intimately linked in Amazonia, as evidenced through decades of data on birds, mammals, trees, and other species from the Forest Fragments Project. Modeling future rainfall and temperature variability can allow for conservation refugia for key species to be located and preserved.

- Francisco Dallmeier (Smithsonian): “Scenario Planning, Functional Conservation Corridors and Tools for Sustainable Investments: Transdisciplinary Experiences from the Field.” Transdisciplinary data tools and early, meaningful engagement with local communities can result in more equitable scenario planning associated with investments (roads, dams, etc.). The Smithsonian has worked to pioneer data tools, principally the Working Landscape Simulator, to inform decision-making in the Madre de Dios region (Peru, near Bolivia & Brazil) and in the Paraguayan Chaco.
- Ane Alencar (IPAM): “Conservation Measures to Deal with the Main Threats to Amazonian Biodiversity, Ecosystem Services, Especially Carbon Stock.” Main drivers of deforestation include land-grabbing and a host of illicit activities (deforestation, mining, trafficking, money laundering) that contribute to an expanding fire season in the region. Policies to reduce deforestation have worked in the past, and must focus on consolidating the protection of Indigenous territories and conservation areas, as well as urgent attention to undesignated areas.

Amazonian Research: Urgent Questions, Themes, and Opportunities

Though this is not an exhaustive list, the themes listed here represent research opportunities that were frequently cited throughout the Workshop. Cross-cutting connections are both explicit and implied throughout this list, which has been subdivided into thematic areas:

- Conservation-Related Research:
 - Applied Conservation Research that will result in major socio-environmental outcomes
 - Forest and river restoration and resulting biodiversity protection
 - Indigenous-led conservation priorities and territorial management
 - What are the resilience limits for multiple key species in a variety of Amazonia microbiomes (modeling)
 - What are optimal conservation approaches in the urban/forest interface?
- Climate adaptation/mitigation and building resilience:
 - What local and regional strategies for adaptation are already in practice and might be scalable?
 - Are there viable carbon sequestration strategies available in the region?
 - Infrastructure to enhance resilient responses to fires and floods
 - Equitable funding and oversight for optimal return
- Socio-bioeconomy research:
 - Understanding the potential size and scope of the bioeconomy, and aligning incentives for multilateral investment (governments, banks, AmazonFund, ESG investors)
 - What are the best goods and services to focus on as models for keeping value chains rooted locally in Amazonia?

- How to ensure that the emerging emphasis on “bioeconomy” results in value and inclusion from local to global scale, avoiding greenwashing.
- Indigenous and local leadership in socio-environmental management
 - What are key principles and organizational dynamics that emerge from Indigenous societies that can be adapted to regional management challenges?
 - How can archaeological, conservation biology, and historical data on Indigenous management of biodiversity guide future innovation?
 - How would the extension of political and economic rights to more-than-human persons (“nature”) impact governance?
 - How can science support the unique knowledge and environmental practices of Afro-descendant communities in Amazonia?
- Public health and human development:
 - What is the impact of fire on organismic and community health?
 - Understand risks & management options for potential zoonotic diseases
 - How can local and Indigenous knowledge systems be made foundational to education systems in the region for the promotion of human wellbeing and inclusive/sustainable development?
 - How can we “future-proof” communities?
- Regional approach to governance, organized crime/impunity:
 - What is the size, extent, social and technological components that support the international criminal enterprises in the region?
 - Land-grabbing; logging; unauthorized ranching (laundered beef); money laundering; wildcat mining; trafficking of drugs, guns, endangered species, and unauthorized fish catch; invasion and exploitation of Indigenous Territories and Conservation Units
 - What novel governance and legal frameworks might be possible for shared management of forests and watersheds?
 - Especially in trans-border areas (Peru/Bolivia/Brazil; Peru/Colombia/Brazil; Colombia/Venezuela/Brazil, etc.)
 - Research & innovation that can enhance legal empowerment of local communities, especially Indigenous and other traditional communities
 - Implementation of environmental governance mechanisms: species & product traceability, due diligence procedures, and verification systems
- On Data: data commons, big data, potential applications of artificial intelligence
 - How might open data and data harmonization principles help us take stock of species diversity and ecosystem services in Amazonia?
 - How can modeling (AI or otherwise) become more responsive and more impactful to guide governance?
 - Can Indigenous data sovereignty be built into scientific practices and bioeconomy projects?
 - Citizen-science initiatives: apps, cell phones, drones utilized by locals

Principles to Guide Transdisciplinary and International Research of Consequence

As stated above, we feel that research in Amazonia is best conceptualized and designed as a transdisciplinary, collaborative, and international investigation that results in actionable knowledge and innovation. Workshop participants discussed a slate of principles that can guide both the formation of effective research teams as well as the funding and governance policies that could stimulate greater research production of this kind. We hope these guidelines will be adopted by funding agencies, foundations, and research centers as we collaborate to make science in Amazonia more responsive to the urgent and complex problems of our time.

Practitioners and funders of transdisciplinary research of consequence should:

- Design explicit pathways for research results to reach and impact policy-makers. This includes developing appropriate communication and education strategies that will help disseminate research results in a broad manner (e.g., in multiple languages and in multiple contexts).
- Embrace epistemological pluralism in research design, methods, and execution. This includes legitimizing Indigenous science as a means of inquiry that is distinct from but co-equal to, disciplines rooted in academic traditions.
- Employ strategies to reduce inequalities in the research enterprise (e.g. between institutions/nations, academic rank, race/gender/ability, interactions with host communities), as well as work affirmatively to reduce barriers to entering research (e.g., reduced access to education, high fees associated with peer-review publications).
- Mobilize extant capacity among local communities as a means to provide reciprocal (“win” - “win”) engagement: local knowledge and capacity is valuable to research, and access to researchers can be valuable to local communities.
- Think critically about divergent reward structures in distinct national academic or institutional contexts. Work in partnership with diverse team-members to transparently address concerns about equity.
- Build-in resources for the broad evaluation of transdisciplinary research: inclusive, multi-sectoral viewpoints over time are valuable, and researchers/funders should build-in resources to facilitate community oversight/evaluation.
- Make data open and freely available wherever possible (“Open Data”), with the key exception of cases where Indigenous Data Sovereignty takes precedence.
- Adhere to Community-based Consultation Protocols where established, and always abide by the principles of free, prior, and informed consent (FPIC).
- Endeavor to be good stewards of all the relationships that support the doing of science, and try to leave behind more fertile ground for future collaborations.

*Respectfully Submitted
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Participants on the Campus of the Smithsonian-Mason School of Conservation

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