

SUBMISSION TO THE BELÉM MISSION TO 1.5

Food-Sharing Initiatives as Climate-Adaptive Infrastructure for Food Security in the Amazon: Barriers, Solutions, and Opportunities for International Cooperation

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Preamble

This submission responds to the call for inputs to shape the Belém Mission to 1.5, issued by the COP29–COP31 Presidencies (Azerbaijan, Brazil, Australia/Turkey). It addresses the action areas and solutions with the highest potential to support NDC and NAP ambition and implementation; and the requirements for strengthening international cooperation. It draws on the scientific framework and evidence base of an ongoing CNPq-funded Programa Conhecimento Brasil "Food-sharing initiatives in the Amazon: Mapping, Assessment and Digitization of Initiatives, Programs and Communities" and on the broader peer-reviewed literature on food-sharing, food sovereignty, and climate resilience in tropical forest contexts. It also responds to the call from the first Global Stocktake (COP28, Dubai) to accelerate action on food systems as an underperforming domain of climate adaptation — a gap that remains unaddressed in the current NDC cycle.

The Amazon is the birthplace of COP30's most important symbolic commitment — and yet home to some of the country's most acute food insecurity. This submission argues that closing this gap requires recognizing food-sharing systems as climate-adaptive infrastructure, investing in the data architecture that makes them governable, and building the international cooperation frameworks that connect local knowledge to global policy.

Question 1 — Action Areas, Solutions, and Barriers

1a. Priority Solutions: Policies, Practices, and Investments

Solution 1 — Recognize food-sharing systems as climate adaptation infrastructure

Food-sharing initiatives — encompassing community redistribution networks, collective cultivation, traditional food exchange practices, knowledge-sharing platforms, and digital food systems — have demonstrated effectiveness as mechanisms for food security and climate resilience across multiple global contexts (Davies et al., 2019; Mackenzie & Davies, 2022; Thompson et al., 2012). In the Amazon, these systems are not new: indigenous and traditional communities have practiced reciprocal food-sharing for centuries, building resilience to

seasonal variability, floods, and droughts through distributed networks of exchange rather than centralized supply chains.

Yet food-sharing initiatives remain structurally absent from NDC implementation plans and National Adaptation Plans (NAPs) in Brazil and across multiple tropical forest nations. This is not because they lack effectiveness — it is because they are unmapped, unevaluated, and therefore invisible to policymakers. As a priority solution, parties should be encouraged to:

- Formally recognize food-sharing and food sovereignty initiatives as eligible components of national climate adaptation strategies.
- Include community-based food systems in NDC implementation plans alongside conventional agricultural and technological interventions.
- Develop national inventories of food-sharing initiatives as part of climate adaptation baseline assessments.

Solution 2 — Invest in food system data infrastructure as a climate priority

The single most consequential barrier to policy action on food-sharing in the Amazon is the absence of data. There is no integrated database of food-sharing initiatives in Pará and Amazonas — not their location, scale, typology, or coverage.

Some Brazilian civil society organizations (e.g., Pacto contra a Fome and Comida Invisível) have begun addressing this gap through their own mapping efforts. Pacto contra a Fome coordinates a national network of actions against hunger, while Comida Invisível has catalogued over 20,000 food-sharing organizations across the country. These initiatives are significant and demonstrate the breadth of existing activity. However, they operate without research infrastructure, standardized assessment methods, or systematic evaluation frameworks necessary to generate the evidence base that climate and food policy requires. Their reach is constrained by fragmented funding, the absence of interoperable data standards, and limited access to sustainability impact assessment tools adapted to the Brazilian context. Bridging the gap between what these organizations already know and what policymakers need to act requires targeted investment in shared methodological infrastructure — precisely the kind that participatory academic research, in coordination with civil society, is positioned to provide.

The ongoing Conhecimento Brasil Project "Food Sharing in the Amazon" is constructing this infrastructure through: GIS-based mapping of initiatives across urban and rural contexts; application of the SHARE IT Sustainability Impact Assessment framework (Mackenzie & Davies, 2019), adapted to Amazonian conditions; and creation of the first publicly accessible integrated database of food-sharing initiatives in the region. The project's methodology demonstrates that this gap can be closed — and that doing so generates direct policy utility, including the ability to identify food deserts, estimate waste-reduction savings, and assess potential reductions in government food assistance costs.

As an investment priority, Parties and international institutions should be encouraged to:

- Fund participatory mapping of food-sharing and food sovereignty networks in climate-vulnerable regions, particularly in tropical forest and small island developing state contexts
- Support development and open publication of regional sustainability impact assessment protocols adapted to non-urban and indigenous community contexts

- Integrate food-system mapping outputs into national climate monitoring and NDC/NAP reporting frameworks

Solution 3 — Protect and valorize indigenous and traditional agroalimentary knowledge

The Amazon's indigenous and traditional communities are the stewards of the world's most sophisticated agroecological knowledge systems. They manage and conserve a significant variety of ecosystems, utilizing them as goods, services, and functions across generations (Oliveira, 2005). Yet they live at the margins of national and regional policies that rarely recognize their territories, production systems, or traditional maintenance strategies (Silva, 2018).

Climate change is dismantling these systems in real time. Extreme drought cycles, illegal deforestation, wildfires, and large infrastructure projects — including major dams whose social and ecological costs are still being documented (Pezzuti et al., 2024) — have severed communities from the ecosystems that anchor their food sovereignty. The knowledge being lost is not merely cultural: it is adaptive infrastructure for the climate future.

- Parties should explicitly recognize traditional food knowledge as a climate adaptation asset in NDCs and NAPs, with appropriate protections for indigenous intellectual property
- Free, prior, and informed consent frameworks should govern any digitization or use of traditional food system knowledge in research or policy contexts
- NDC implementation plans for tropical forest nations should include dedicated measures protecting indigenous food-systems territories from climate-driven and development-driven disruption

Women and youth are disproportionately both the primary victims of food insecurity and the principal holders of traditional food-sharing knowledge in Amazonian communities. Women, in particular, are the central actors in food production, preparation, and distribution across indigenous and riverine households — yet they remain systematically excluded from the governance structures that shape food and climate policy. Any framework for integrating food-sharing systems into NDC and NAP implementation must explicitly address gender equity and intergenerational knowledge transmission as structural conditions for long-term effectiveness.

1b. Finance, Technology, Capacity Building, and Institutional Opportunities

Translating these solutions into NDC and NAP implementation requires specific institutional enablers:

- Dedicated climate finance windows for food system adaptation in tropical forest regions, within the Green Climate Fund and the new loss and damage fund, should be accessible to community-level actors and research institutions, not only national governments.
- Technology transfer frameworks should include open-access food system assessment tools — such as this adapted version of the SHARE IT SIA protocol — enabling researchers and communities in developing countries to evaluate and report on adaptation outcomes without dependency on costly proprietary systems.

- Capacity building should specifically target the translation gap between food system research and climate governance — training researchers in developing countries to frame scientific findings as policy-relevant inputs, and training policymakers to read and use that evidence.
- Institutional frameworks should create formal pathways for community-based food-sharing organizations to participate in NDC development and review processes, rather than remaining permanently outside the governance architecture.

1c. The Most Significant Barriers

Three structural barriers currently prevent food-sharing initiatives from contributing to NDC and NAP ambition and implementation in the Amazon and comparable contexts:

- **Recognition barrier:** Food-sharing initiatives are systematically absent from climate and food policy frameworks despite evidence of their effectiveness. This reflects a deeper epistemological barrier: policy systems that privilege measurable, monetizable, market-facing interventions over community-based, knowledge-intensive, and relational ones.
 - Required response: Explicit inclusion of food-sharing systems in NDC eligibility criteria and NAP sectoral frameworks.
- **Methodological barrier:** No standardized impact assessment framework exists for food-sharing initiatives in Amazonian or comparable tropical forest contexts. The most robust available tool — the SHARE IT framework (Mackenzie & Davies, 2019) — was designed for urban settings in the Global North and requires substantial adaptation to accommodate rural communities, traditional knowledge systems, dispersed geographies, and indigenous land rights.
 - Required response: International investment in the development and open publication of adapted assessment protocols for Global South contexts.
- **Governance barrier:** Food-sharing research generates evidence directly relevant to climate adaptation but lacks systematic pathways into UNFCCC governance processes. The current architecture privileges state actors and large NGOs, leaving peer-reviewed scientific evidence from smaller institutions in developing countries with limited entry points.
 - Required response: Dedicated mechanisms connecting food system researchers to UNFCCC subsidiary body work on agriculture and food security, including the Sharm el-Sheikh joint work programme.

Question 2 — Strengthening International Cooperation

Food system adaptation in the Amazon is inherently a global governance challenge — not only because the Amazon's ecological stability is a global climate asset, but because the scientific and institutional capacity needed to govern it cannot be built in isolation. This submission identifies four concrete requirements for strengthening international cooperation in this space.

2.1 — Build South-South and South-North Scientific Cooperation Frameworks

The research presented in this submission itself is a model of the cooperation required. The CNPq project involves institutional partnerships with the University of Turin (Italy), Federal

University of Minas Gerais (Brazil), University of Southern Denmark (Denmark), the IGCP-726 GEOfood Programme (an international UNESCO-affiliated network promoting sustainable food practices in geoparks), the Marie Curie Alumni Association, and the Slow Food network. These partnerships bring together expertise in geoecology, conservation biology, food systems, and sustainability assessment.

What is required to scale this model:

- Dedicated international cooperation frameworks for food system and climate adaptation research in tropical forest regions, with multi-year funding stability.
- Recognition of researcher mobility (including fellowships such as Marie Curie) as a climate cooperation instrument, supporting knowledge transfer between Global North institutions and Global South research contexts.
- South-South cooperation mechanisms linking Amazonian food system researchers with peers in comparable tropical forest contexts — the Congo Basin, Southeast Asian forests, and Pacific island systems — to build shared methodological frameworks and comparable evidence bases.

2.2 — Integrate Food Sovereignty into Multilateral Climate Architecture

The UNFCCC's existing work on agriculture and food security provides a platform that should be strengthened and explicitly connected to food sovereignty dimensions. Currently, this work focuses predominantly on production efficiency and emissions reduction in commercial agriculture. It gives insufficient attention to:

- Community-based and traditional food systems as adaptation infrastructure.
- Food-sharing and redistribution networks as waste-reduction and resilience mechanisms.
- The intersection of food sovereignty, land rights, and climate adaptation for indigenous and traditional communities.

The Belém Mission to 1.5 is an opportunity to call for explicit expansion of the Sharm el-Sheikh work programme to encompass food sovereignty and community-based food systems, with dedicated engagement from indigenous peoples' organizations and traditional community representatives. The author attended COP30 in Belém as an observer, including the Cúpula dos Povos (the largest civil society gathering in the history of the climate negotiations) and witnessed firsthand the scale and depth of indigenous and traditional community mobilization around food sovereignty, territorial rights, and ecosystem stewardship. The level of representativeness and participation of indigenous and traditional communities in climate governance can no longer be treated as peripheral, especially in international climate meetings. These communities are not stakeholders at the margins of the food and climate agenda: they are their most knowledgeable and legitimate guardians, holding centuries of adaptive practice in managing the ecosystems and food systems upon which global climate stability depends. Their presence at COP30 was not symbolic — it was a demand for structural inclusion. The Belém Mission to 1.5 must respond to that demand with concrete governance mechanisms, not merely consultative gestures.

2.3 — Create Formal Pathways from Research to Policy

Required mechanisms include:

- A dedicated synthesis function within the UNFCCC Secretariat or the Intergovernmental Panel on Climate Change (IPCC) for food sovereignty and community-based food system research.
- Annual calls for evidence submissions from research institutions in developing countries, with support for translation and policy framing.
- Formal consultation roles for food system researchers in NAP development processes at the national level, with international capacity-building support

2.4 — Ensure Climate Finance Reaches Community-Level Food System Actors

The Belém Package's commitment to mobilize \$1.3 trillion annually by 2035 for climate action, and to triple adaptation finance by 2035, represents a transformative opportunity — but only if the financing architecture reaches actors at the community level. Currently, the majority of climate adaptation finance flows to national governments and large implementing agencies, with minimal penetration to the community-based food-sharing organizations on the ground.

International cooperation should prioritize:

- Direct access modalities for community-based food-sharing organizations within multilateral climate funds.
- Simplified reporting requirements for small-scale adaptation actors, with technical support for documentation and impact measurement.
- Inclusion of food-sharing and food sovereignty initiatives as eligible activities within National Adaptation Plan financing frameworks.

Evidence Base

The recommendations in this submission draw on the scientific framework, literature review, and methodological design of the Programa Conhecimento Brasil project "Food Sharing in the Amazon: Assessment and Digitization of Initiatives, Programs and Communities" (Chamada CNPq/MCTI/FNDCT N.º21/2024, 2025–2029), as well as on the broader peer-reviewed literature of the author. The project is currently in its first phase, with field assessments planned for 2028 in Pará and Amazonas. A first peer-reviewed article on the conceptual and methodological framework is in preparation.

The project includes the collaboration of the following researchers:

Dr. Priscila Lopes (Federal University of Rio Grande do Norte), whose research on human ecology, governance, and food security in Amazonian communities provides a core institutional and scientific anchor for the project;

Dr. Luiza F. A. de Paula (Federal University of Minas Gerais/Centro de Referência em Informação Ambiental — CRIA), whose expertise in biodiversity informatics and plant conservation strengthens the project's capacity to integrate biocultural diversity dimensions into digital systems and platforms.

Dr. Marco Giardino (University of Turin), specialist in sustainable territorial development and geosciences, who contributes to the project's mapping, monitoring, and international dissemination dimensions;

Dr. Sara Gentilini (University of Southern Denmark), founder of the GEOfood movement and coordinator of the IGCP-726 GEOfood programme, who contributes expertise in sustainable territorial food development and international scientific networking.

Key works and intellectual foundations:

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Contact and Further Engagement

The author welcomes further engagement with the Belém Mission Presidencies and the UNFCCC Secretariat. Detailed technical documentation, project methodology, and preliminary findings are available on request. The author is also available to contribute to consultative workshops, expert dialogues, or technical working groups related to food security, food sovereignty, and climate adaptation, and in-person participation at the COP31 in Antalya. Specifically, the author requests consideration of food-sharing and food sovereignty systems as a dedicated thematic area in the Belém Mission's engagement process, and inclusion of community-based food system evidence in the pre-COP31 report to be released ahead of Antalya.