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A united front to save fishing in the Amazon

On the banks of the Amazon River, a team of French and Brazilian researchers is working with a community whose fish stocks are threatened by human activities and climate change. Through a role-play game, local fishermen are gaining a global understanding of the issues to find solutions to adapt to these collectively.

Des pêcheurs sur le fleuve Amazone. Crédit : RocioChiappino / Shutterstock.

In northern Brazil, the Amazon River widens to form immense expanses of water teeming with fish. The *Lago Grande* is one of these. We are on its shore, near the small city of Santarém in the state of Pará. Under a large porch, a dozen people, mainly men, stand around a game board that represents their area. By moving pawns and selecting marbles, they play a strategy game that recreates their livelihood: fishing.
An activity they practise to feed their families, earn a living, or run small businesses, which might be part of a larger association. A diversity of profiles in this "serious game" in which players must make decisions in a context of a resource threatened by human and climate change: if a player exceeds their fishing quota, the fish – or even their boat – are confiscated.

"The game allows a better understanding of everyone's interests and strategies, from those involved in small-scale artisanal fishing to industrial fishing. Gradually, this leads to the adoption of collective decisions for more sustainable management,"

explains Marie-Paule Bonnet. As Senior Scientist at the French National Research Institute for Sustainable Development (IRD), this hydrologist leads the "Sustaining Amazon Floodplain Biodiversity and Fisheries under Climate Change" (SABERES) project, which is supported by the BNP Paribas Foundation.
Launched 20 years ago, this interdisciplinary research programme is led by a team of 30 French and Brazilian researchers and uses satellite images and field studies to map the changes in habitat and in fish populations in the area. This is carried out in collaboration with a local NGO that acts as a bridge between government agencies and the local population.

From A to Z, the project takes a participatory approach. Local fishermen are involved in the development of the role-play game, which has several versions depending on the season. Because here, the landscape changes dramatically over the course of the year. Accustomed to floodwaters that can reach depths of seven metres, the local community adapts its activities and dwellings so well to the aquatic cycle that they are known as "people of the waters". But today this balance is threatened. Climate change, deforestation, dam construction: all these factors have increased the frequency and intensity of flooding; the high-water mark has risen by a metre in the last 20 years. As a result, *"all the small communities that were settled in the lakes are in the process of moving to dry ground,"* observes Marie-Paule Bonnet.

But in the short term, the principal threat is industrial fishing. Refrigerated factory ships from major Amazonian cities are contributing to empty the *lagos* of fish, using huge nets that capture everything in their path, so the stocks are unable to regenerate. In the state of Pará, the recent boom in this industry has coincided with a significant decline in fish stocks, an essential source of food as well as income. Faced with these factory ships that are subject to few regulations (quotas, fish net mesh size, fish size, etc.) and checks, what should be done?

While the SABERES project aims to help artisanal fishermen assert their rights in collaboration with the environment agency, another goal is to involve the industrial fishing sector in global conservation policy. Marie-Paule Bonnet believes in *"win-win agreements, which are working in the state of Amazonas"*. There, the fishing industry has understood that it is in their interest to allow resources to regenerate, not least because certain companies buy fish from small-scale fishermen. To this end, the idea is to bring public officials and agencies that regulate fishing around the game board. *"If we don't include bodies with the power to make checks and sanctions, we can't truly tackle the problem,"* points out Christophe Lepage, a researcher at the French Agricultural Research Centre for International Development (CIRAD) and member of the project. If successful, this collaborative model could be replicated elsewhere in the state, and beyond.

The approach is already showing results, beginning with raising the awareness of local fishermen. "*I like this game and its dynamics,"* explains one. "*The objective is not just*

to earn money but to conserve resources. If we look at everything through the lens of money, this will violate the whole." For Marie-Paule Bonnet, the project has also started "*a dialogue between different types of fishermen and the environment agency. This is a big step forward for the region."*

Yet to protect local ecosystems, fishing is not the only sector where action is required. Livestock production is also critical, as it contributes to deforestation. While tree clearance in this state is less dramatic than in other areas of the Amazon, it has increased in recent years, destroying the powerful natural barrier the jungle provides against rising waters. This too has a negative impact on fish stocks. In the floodplain, scientists have observed that the absence of trees reduces fish populations. The only solution, believes Marie-Paule Bonnet, is reforestation, "*but that would mean less livestock farming, and less revenue".*

These issues are so intertwined that they require the participation of the region as a whole: *"We are only mediators,"* the scientist stresses. "*An effective project is one co-constructed with the local population."* Equally, any solution must consider climate change and biodiversity together. *"Although local artisanal fishermen are most affected in the immediate term by industrial fishing, in the background there is climate change."* The researcher is more hopeful about both issues since the return of Lula to the Brazilian presidency, replacing the climate sceptic Bolsonaro. *"I hope,"* she concludes, *"that our project will promote the spread of good practices to and the adoption of existing good practices from other regions, such as the establishment of nature reserves and protected areas."* Working with local populations, step by step, will help to safeguard the Amazon, so essential to the health of our planet.

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