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## Strengthening value chains of products from the Amazon: Lessons from and to the *Gosto da Amazônia* initiative

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**Abstract.** Forests guarantee food supply for Brazilian traditional peoples and communities. In this sense, the protection of forest areas is necessary to maintain livelihoods, enhance food security and ensure the provision of ecosystem services. Although indigenous communities and traditional peoples in the Amazon have access to food sources, they are vulnerable since they make a living in remote areas, with few opportunities for access to conventional markets, public policies, jobs, or stable sources of income. However, these communities possess ancestral knowledge that, once combined with technical knowledge of sustainable management of plant and animal species, creates opportunities for the development of food security and income generation strategies based on biodiversity conservation. The “*Gosto da Amazônia*” initiative is an example in this sense. It is the result of an institutional partnership between national and international stakeholders, including Brazilian and American partners that aimed at improving the quality of life of communities involved in the management of *Arapaima gigas* (pirarucu), one of the largest freshwater fish in Brazil. This species used to be under threat before the adoption of sustainable management strategies, and despite the efforts, it still competes in the market with the illegally harvested chain. Overall impacts cover the social, economic, environmental, and cultural spheres, constituting a positive example for other value chains of products from the Amazonian region. This work aims at i) identifying the key factors that led to the current level of accomplishment of this long-term initiative and derive insights for other value chains, and ii) providing inputs for the definition of new steps towards the improvement of the results obtained so far. The relevance of local organization of production, as well as the creation of strong stakeholder networks, the expansion of markets, and the implementation of financial reinvestment for project sustainability were highlighted as essential factors for the success of this and other initiatives that propose the transformation of current food systems.

**Keywords:** Amazon, food security, pirarucu, sustainable management, value chains.

### 1. Introduction

Natural ecosystems play a crucial role in the maintenance of human health through the provision of essential nutrients. Furthermore, products derived from forested areas are important in global industries, facilitating the growth of sustainable bioeconomy within the food and agriculture sectors (Webb et al., 2020). Therefore, the protection of forest areas is necessary to maintain

livelihoods, enhance food security and ensure the provision of ecosystem services. In Brazil, forests guarantee food supply for traditional peoples and communities. Although indigenous communities and traditional peoples in the Amazon have access to food sources, they are vulnerable since they make a living in remote areas, with few opportunities for access to conventional markets, public policies, jobs, or stable sources of income (Maluf et al., 2022; Rorato et al., 2022). However, these communities possess ancestral knowledge that offers opportunities for the development of food security and income generation strategies based on biodiversity conservation, when combined with scientific and technical knowledge of sustainable management of plant and animal species (El-Hani et al., 2022). Moreover, the need to adapt food systems to new global realities is critical for multiple global agendas (Webb et al., 2020).

The collective brand *Gosto da Amazônia* is an example of sustainable adaptation of food systems. It was created by the *Coletivo do Pirarucu*, an institutional partnership between national and international stakeholders, including Brazilian and American partners that aimed at improving the quality of life of communities involved in the management of *Arapaima gigas* (pirarucu), one of the largest freshwater fish in Brazil. After a period of intensive fishing in the Amazon, particularly in the watershed area of Juruá, Negro and Solimões Rivers, regulations established by local and national authorities contributed to the recovery of species' population (Santos et al., 2022). The success in the recovery was achieved largely by the joint work of fishermen organisations, who saw in this initiative an opportunity for income generation. Thereafter, the organisation of local communities and stakeholders was the key for the consolidation of actions to strengthen this value chain: moving from species population recovery to analysing options for product management and market access.

The success of this initiative is evident and has no precedents in the Amazonian region. In this sense, other value chains of products from the Brazilian sociobiodiversity might benefit from the lessons that could be learned from this experience. Therefore, this work aims at i) identifying the key factors that led to the current level of accomplishment of this long-term initiative, and ii) providing insights for the definition of new steps towards the improvement of the results obtained so far. This will be done by applying cause-effect analysis in the first place, and the development of a strategy based on value chain analysis (VCA) in the second. This work is organized in three parts from this point on: Materials and methods are explained in the second section, then results are presented and discussed in the following part, while conclusions and a brief outlook are presented in the fourth and last part.

## **2. Material and Methods**

Methods were set to meet two objectives: the identification of key factors for value chain success and the definition of new steps to consolidate and improve the results obtained.

### **2.1 Identification of key factors for the success of the initiative**

First, activities with high impacts were identified. This was done using information available on impacts in a set of relevant categories. The level of impact was qualified considering relative changes in the period 2015-2022, from the beginning of the sustainable management strategy. The categories considered were species recovery, income generation, price improvement, new markets reached, and the construction of the stakeholders' network. Besides, cause-effect analysis was conducted to understand the reasons behind the results obtained. In this way, key processes for value chain success were subsequently identified.

### **2.2 New steps to achieve better results- Value chain analysis**

In a second phase, value chain analysis was conducted following Zamora (2016), searching for ways to consolidate the impacts obtained because of collective efforts and, in this way, improve

the product positioning in the recently explored markets. According to Zott et al. (2011 in Zamora, 2016), VCA places its emphasis on comprehending complex connections within a network, where the processes of generating and seizing value take place within a system that involves suppliers, distributors, partners, and collaborators. The idea behind the analysis is to find more resources and opportunities for business consolidation and expansion.

### 3. Results and Discussion

#### 3.1 Identification of key factors for the success of the initiative

##### *Definition of categories*

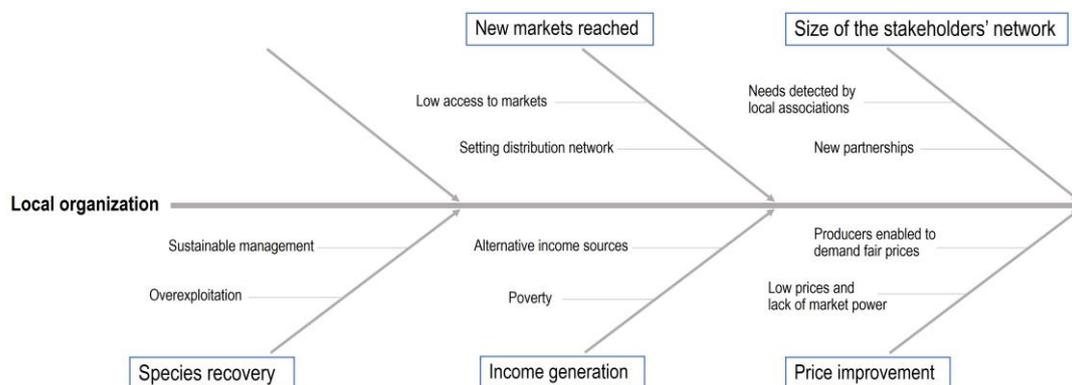
The sustainable management of the species *Arapaima gigas* in the Amazon has been achieved by effect of actions in specific areas that cover the social, the economic and the environmental dimensions. Categories with stronger impacts were enlisted, they are presented in Table 1.

| Categories            | Impact   |
|-----------------------|--|
| Species recovery      | 600% of recovery reported by sustainable managers  |
| Income generation     | Expressive improvement of per capita income in the period analyzed: as an example, the weekly income from a fishing journey of a group of 38 families in São Raimundo (AM) was BRL 330,000. This represented ca. USD 1,736 per family. |
| Price improvement     | From ca. BRL 3,5/kg to BRL 7/kg. Not applicable for all communities.   |
| New markets reached   | Big cities: Brasilia, Rio, and Sao Paulo, plus a distributors' network.  |
| Stakeholders' network | 23 members. Considered strong locally but still incipient nationally.  |

**Table 1:** Definition of categories with stronger impacts, based on data from the period 2015-2022.

##### *Key factors*

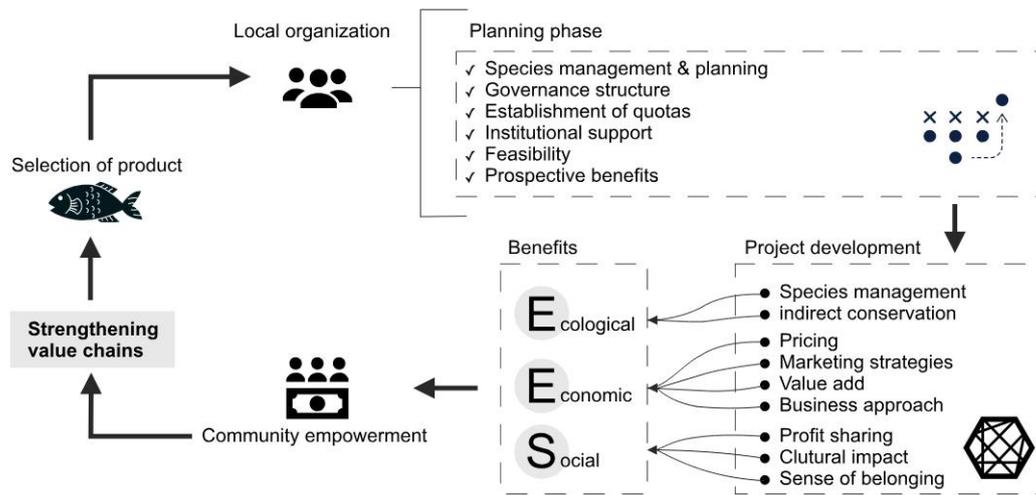
Positive and negative factors emerged as a motivation for the project's achievements. As an example, issues like overexploitation where the reason for the adoption of sustainable management strategies, that in turn was the reason for the recovery of the species population. The same result applies for the rest of the aspects analyzed (see Figure 1).



**Figure 1:** Ishikawa (cause-effect) diagram for the development of sustainable management and strengthening of the value chain associated to the species *Arapaima gigas*. Compiled by the authors, 2023.

### *Lessons from the experience: A potential strategy for value chain strengthening*

Local organization is the basis to the success of this strategy. Without the local organization of community leaders and producers' associations, the chances to develop a strategy to increase production and reach new markets would have been very low. Therefore, a first step for producers from other value chains should be defining methods to communicate and share their needs, expectations, and ways to collaborate. In this regard, it is also important to consider that projects should provide the means for qualified and equitable governance through procedures that value participation and promote community engagement and leadership in the management of community initiatives.



**Figure 2:** A potential strategy for value chain strengthening. Compiled by the authors, 2023.

Once local leadership has been defined and a species (either animal or vegetal) has been chosen, it would be ideal to start with the planning phase, where the management strategy should be defined according to local dynamics, as well as a governance structure, rules to avoid overexploitation, how to gain institutional support, the economic feasibility of the project, and the projection of potential benefits. With all these points defined, the project can take place, bringing environmental, economic, and social benefits from a given set of activities (see Figure 2). However, there is one more element that should be considered: a feedback loop that should be permanent, to ensure project continuity over time. The benefits obtained would serve as a reward for the job done, and they would provide community empowerment. This is usually the case when communities protect their heritage, what they do, and their local values (Masolo, 2002). In this case, a virtuous circle is generated when there is a connection between the beginning and the end of the sustainable management cycle. Issues from unsuccessful strategies implemented in communities are frequently related to the lack of this link or the lack of financial return (Taylor & de la Sablonnière, 2013).

### **3.2 Value chain analysis**

According to Zamora (2016), VCA involves the process of "market mapping" to monitor and assess the roles played by various participants in the value chain and the dynamics between them. This analysis of interactions within the value chain helps recognizing the determinants that impact the effectiveness or ineffectiveness of the chain. The outcome of this market mapping effort delineates the key components of the value chain, the supportive ecosystem, and the entities responsible for delivering services. For the purposes of this work, the analysis will be limited to the definition of a set of strategies based on the current state-of-the-art and future possibilities for the value chain.

#### *Lessons to the initiative: Following steps*

- One issue to be solved is the capacity of the brand to sustain by itself from a financial perspective, since it still depends on external resources to operate.
- The necessity to fight for tax exemptions and other fiscal benefits such as subsidies.
- The identification of specific needs to increase productivity and the analysis of the current carrying capacity of ecosystems to envision potential for production expansion.
- The adoption of business management plans and the execution of constant reinvestment for project sustainability.

#### **4. Conclusions and Outlook**

Undoubtedly, local organisation and the successful conduction of sustainable management strategies were indispensable elements for the development of this initiative. In a second level of maturity, a strong network was constituted, and a collective brand was created, while new markets were reached. These facts allowed local members to demand better prices and improve producers' income. However, this achievement was not linear, for all the members of the initiative, at all levels, due to the complexity of market dynamics and the limited bargaining power of this group. As lessons to the *Gosto da Amazônia* initiative itself, the implementation of reinvestment strategies are potential next steps to explore. Besides, it has been a very complex task to reach the benefits obtained so far, and some of them are not necessarily applicable to other value chains. Further research should study more deeply each aspect presented in this paper, and consider the conduction of a more detailed VCA to map and identify potential stakeholders that could be included in the business network to expand capacities, taking always into consideration sustainable production constraints.

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## Annex

| Institution  | Sector/type         | Country |
|--|---------------------|---------|
| Associação de Produtores Rurais de Carauari (ASPROC)   | Local association   | Brazil  |
| Associação do Povo Deni do Rio Xerúá (ASPODEX)   | Local association   | Brazil  |
| Associação dos Trabalhadores Rurais de Juruá (ASTRUJ)  | Local association   | Brazil  |
| Associação dos Trabalhadores Agroextrativistas do Médio Purus (ATAMP)                                    | Local association   | Brazil  |
| Associação dos Produtores Agroextrativistas da Assembleia de Deus do Rio Ituxi (APADRIT)                 | Local association   | Brazil  |
| Associação Indígena do Povo das Águas (AIPA)   | Local association   | Brazil  |
| Associação dos Produtores Agroextrativistas da Colônia do Sardinha (ASPACS)                              | Local association   | Brazil  |
| Associação dos Comunitários que trabalham com o desenvolvimento sustentável do Município de Jutafá (ACJ) | Local association   | Brazil  |
| Associação dos Moradores do Rio Unini (AMORU)  | Local association   | Brazil  |
| Associação Agroextrativista de Auati-Paraná (AAPA)   | Local association   | Brazil  |
| Federação dos Manejadores de Pirarucu de Mamirauá (FEMAPAM)  | Local association   | Brazil  |
| Associação dos moradores Agroextrativistas do Baixo Médio Juruá (AMAB)                                   | Local association   | Brazil  |
| Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio)   | Public              | Brazil  |
| Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA)                         | Public              | Brazil  |
| United States Forest Service (USFS)  | Public              | USA     |
| United States Agency for International Development (USAID)   | Independent agency  | USA     |
| Sindicato de Bares e Restaurantes do Rio de Janeiro (SINDRIO)  | Labor Union         | Brazil  |
| Instituto Internacional de Educação do Brasil (IIEB)   | Education institute | Brazil  |
| Operação Amazônia Nativa (OPAN)  | NGO                 | Brazil  |
| Memorial Chico Mendes (MCM)  | NGO                 | Brazil  |
| Instituto de Desenvolvimento Sustentável Mamirauá (IDSM)   | NGO                 | Brazil  |
| Instituto Juruá (IJ)   | NGO                 | Brazil  |
| Fundação Vitória Amazônica (FVA)   | NGO                 | Brazil  |

**Table 2:** Stakeholders involved in the creation of the collective brand *Gosto da Amazônia*