WFP
World Food Programme
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The future of food systems in the Amazon

Analysis on food systems approaches

FOOD | SYSTEMS | FORESIGHT

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Executive summary

The Amazon ecosystem, which is crucial for global climate stability and for the livelihoods of more than 34 million people, now faces a tipping point. The complex and diverse food systems of this vast region are characterised both by the richness of its indigenous and traditional communities and by increasing pressure from extractive industries, industrial agriculture and the climate crisis. This study seeks to provide an insight into these systems, exploring interactions between their key players and the dynamics that shape them.

Our review of the literature on food systems in the Amazon showed that different terms are used depending on language and region. The English language literature emphasises more theoretical and general concepts such as “systems”, “drivers”, and “agrobiodiversity”. Spanish language texts focus on more community and social terms, such as “indigenous”, “communities” and “agroecology”. In Portuguese, the focus is more on “food security” and “nutrition”, reflecting more practical and local concerns. This diversity reflects a latent tension between economic development and environmental conservation, an issue that cuts across all levels of governance in the Amazon.

Governance in the region is highly complex. The Amazon is divided up among several nation states, each with different visions and priorities, often in conflict within their own territories.

The following are key actors: indigenous communities, with in-depth knowledge of the environment and sustainable management practices; smallholders struggling to maintain traditional production systems; and large agribusiness corporations, whose operations often prioritise productivity over sustainability. In addition, NGOs, universities and local governments try to influence policy and practice in the region, although their efforts are often limited by power vacuums. These gaps are often filled by illegal actors, such as armed groups, drug traffickers, miners and loggers engaging in unregulated exploitation of resources.

The dynamics affecting these systems are multifaceted: urbanisation is transforming consumption patterns, technology offers opportunities but also creates risks to sustainability, and environmental pressures such as deforestation and climate change continue to grow. These interconnected factors raise a number of questions: How can we reorient these dynamics to create more resilient food systems? How do we balance the urgent need to protect the Amazon with the need to feed a rapidly growing population?

The present has many challenges, but this is absolutely the right time to act. We cannot change the past, but we have the opportunity to shape the future. How should local and global actors act to ensure that Amazonian food systems don't just survive but thrive? What role should indigenous communities play in creating innovative solutions? How should national governments be engaged to integrate conservation with economic development? How can we build more resilient food systems in the Amazon?

To focus on our shared futures, we selected and convened a group of stakeholders representing the private sector, government and civil society from eight different countries for a two-day exploratory planning exercise in Belém, Brazil. With this group of nearly 40 leaders, we spent the first day exploring the present and past of food systems in the region, with the second day used to look to the future. The group identified two critical uncertainties that have the greatest potential impact on future food systems: the ecological health of the planet and the stability of governments and public policy. Based on these two critical uncertainties, we constructed **four possible scenarios**: "a non-resilient scenario", "living well", "an irreversible situation", and "conflicted fragility". While these four scenarios represent very different possible realities, we find some similarities between them: the importance of including indigenous communities in decision-making about the region and strengthening indigenous knowledge, and the importance of guaranteeing access to natural resources, protecting land rights and restoring nature. Understanding these possible scenarios and taking account of these key requirements for building a more resilient future is crucial for multilateral actors in the development of their plans for the Amazon[1].

This study analyses the region's food systems and invites critical and ambitious reflection on the power we have to influence their future.

1 In this document we use "Amazons" as a plural form in some instances in response to the suggestion of one of the participants of the Exploring Future Scenarios workshop (Annex E). The aim is to recognise and honour the multiple cultures that coexist in this vast region.

1. Introduction

The Amazon rainforest is crucial both for the people who live there and for global environmental balance. This vast ecosystem - **home to 10% of all species on the planet** and to more than 34 million people, including more than 350 indigenous communities and eight different countries - plays a vital role in climate regulation and biodiversity preservation. The relationship between Amazonian communities and their natural environment is intrinsic: the forest not only sustains their livelihoods, but is also essential for the food security of millions of people.

However, this balance is under threat. Deforestation, climate change, and unsustainable resource exploitation such as large-scale mining and industrial agriculture are eroding the delicate bonds between local communities and their environment. These challenges not only put the Amazon ecosystem at risk, but exacerbate food insecurity and affect the livelihoods of those who depend on the forest.

Current food systems in the Amazon reflect this complex reality. While we cannot change the past, we do have the capacity to forge a different future. This study seeks to shed light on food systems in the Amazon region: **how they are understood, who participates in them and the dynamics that affect them**. It also presents the results of a participatory exercise in which key actors in the region devised future scenarios, generating narratives for discussion and identification of possible action points.

Our aim is to **identify a path towards a more resilient future for Amazonian food systems**, to ensure that they can meet the challenges of the future and continue to be a vital source of livelihoods for present and future generations

2. Methodology

This work includes the result of (1) primary and secondary research to understand discourses on food systems and the dynamics and actors that affect them in the Amazon region; and (2) a Future Scenario Exploration workshop.

In the first part, in order to understand the predominant narratives on Amazonian food systems, a methodology combining bottom-up and top-down approaches was adopted, integrating local experiences with academic trends.

The top-down approach focused on a systematic review of the academic literature on Amazonian food systems from a macro perspective. This literature review followed the approach discussed by Snyder (2019), in which scientific articles are prioritised and qualitative and quantitative analyses are conducted with the aim of assessing the "state of knowledge". Davis (2014) presents the stages of systematic literature reviews, including the procedure proposed by the Berkely Systematic Reviews Group, which involves formulating focus questions for the review, broad research process, study evaluation and elimination, summary and interpretation of results, and report writing.

Based on the project objective, the proposed questions considered the systemic approach and were divided into the following categories:

- **Key concepts in food systems discourse:**

  What is the current state of food systems discourse in the region, what definitions and terms are used, has the discourse shifted from food production to food security, do food systems approaches differ between Amazonian countries?

- **Key actors in Amazonian food systems:**

  Who are the main actors involved in food systems, how do these actors relate to each other, what role do the traditional approaches and beliefs of indigenous communities play in food systems?

- **Dynamics:**

  What are the main dynamics impacting food systems, what are the challenges, what are the opportunities, what are the dynamics between urban and rural scenarios?

The literature review used tools such as Google Scholar, Semantic Scholar, Science.gov, Refseek and Capes Journals to cover articles in English, Portuguese and Spanish. The main search key was the set of terms: **food + system + Amazon** (Amazonia) in English and **sistemas/sistema + alimentar/alimentario + amazônia/Amazonia** in Portuguese/Spanish (See Annex A). Approximately 100 articles were identified, of which 45 were selected (21 in English, 13 in Portuguese and 11 articles in Spanish) based on their relevance in accordance with criteria such as focus, actors and dynamics. These articles were analysed qualitatively and quantitatively, using tools such as Voyant, which made it possible to identify patterns and relationships between key terms in the texts in the form of a term cloud and the networks between terms.

The bottom-up approach generated spaces for reflection where experts and indigenous leaders shared their knowledge on production, distribution and consumption in the region. There were several activities, including work sessions with Tita Alvira, an ecologist and expert on food systems and indigenous communities in the Amazon, semi-structured interviews with three indigenous leaders, and a focus group with members of WFP offices in the region. The qualitative information was used to define key patterns and critical challenges which were then analysed using thematic coding.

In addition, a workshop on Exploring Future Scenarios of food systems in the Amazon region was held on 17-18 September 2024 in Belém, Brazil. The workshop provided a space for discussion among 34 participants from eight Amazonian countries (Brazil, Colombia, Peru, Ecuador, Bolivia, Venezuela, Suriname and Guyana), including private sector representatives, civil servants, academics and representatives of the World Food Programme (WFP). Through systems thinking and the identification of possible future scenarios, dialogue and collaboration were promoted to build a shared vision of possible food systems futures and to define strategic action points.

The workshop followed a prospective methodology divided into two phases: Explore and Visualise. It began with a visit to the Ver-o-Peso market, one of the largest and oldest in Latin America, to contextualise the region's food systems and explore their interconnectivity. Then, in groups, participants analysed the main dynamics of the Amazon and selected two critical uncertainties as a basis for building future scenarios. During the "envisioning" phase, the groups created futures narratives based on the identified uncertainties and the guiding question How could we create more resilient food systems in the Amazon by 2050? Sharing the scenarios facilitated the highlighting of common challenges and strategies that can be used to generate concrete recommendations adapted to regional contexts.

Finally, the findings of both approaches were combined to provide a comprehensive picture of Amazonian food systems, highlighting the complex interactions between actors and the dynamics that influence the region. The results were drafted in this report, to present a coherent interpretation.

3. How are food systems understood in the Amazon region?

First, we wanted to understand what is meant by "food systems" in the region. What other concepts are used to talk about, discuss and analyse these systems? Do food systems approaches vary among Amazonian countries? We began by analysing the current state of the discourse on food systems because we know that this concept can be external to the region or interpreted in different ways. And if we want to understand the past, present and future of these systems, it is vital to understand how they are conceptualised within the region.

3.1 Key concepts in amazonian food systems discourse

We conducted quantitative analysis (textual), qualitative analysis (content) and comparative analysis (country) in relation to the key concepts and discourses of the selected texts..

3.1.1 QUANTITATIVE ANALYSIS

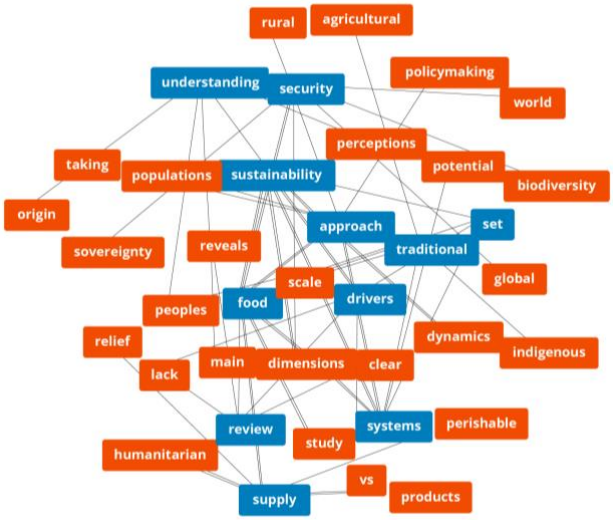
In the quantitative analysis we used the Voyant system to collect summaries in English, Spanish and Portuguese of the selected articles. We then put all the summaries together in a single text and performed a textual analysis using two tools:

i) word cloud and
ii) relationship between terms.

3.1.1.1 Literature in English

In the English language literature, conceptual terms such as system, drivers, social, agricultural and policy appear frequently, reflecting the more theoretical approach of the articles, as can be seen in the word cloud. In relation to terms directly related to food system concepts, the terms *indigenous*, *traditional* and *agrobiodiversity* are of note. Terms related to sustainable production systems, such as agroecology, regenerative agriculture and nature-based agriculture, did not appear with significant frequency in the text of the 21 English language articles analysed. Regarding relationships between terms, the term "traditional" is related to other terms and, surprisingly, the term "indigenous" does not have as many relationships with other terms, i.e. it is often mentioned in the context of or close to other more frequent terms.

Figure 1. Word cloud and term network of English texts[2].



2 The placement graph tool is a network graph where keywords and directly related words are in blue and indirectly related words are in orange.

3.1.1.2 Literature in Spanish

In the quantitative analysis of the Spanish texts, the frequency of the terms “indigenous”, “food” and “communities” is of note, demonstrating that the work focuses on issues related to these groups. Although less frequent, the term “agroecology” appears in the Spanish word cloud, but does not appear in the English and Portuguese texts. In relation to the word web, the terms “system” and “indigenous” have a central position in relation to the other terms, with “system” being strongly related to “food” and “indigenous” to social terms such as “communities”, “peasants” and “tradition”.

Figure 2. Word cloud and term network of Spanish texts.

3.1.1.3 Literature in Portuguese

The textual analysis of the literature published in Portuguese yielded more specific terms compared to the analysis of the literature in English, with emphasis on terms such as “children”, “quilombolas"[3], “nutritional” and “institutions” that do not appear in the English or Spanish analyses. It is also noteworthy that the word “system” is not very frequent in the texts, as it does not even appear in the word cloud. Instead, terms such as “food consumption”, “nutrition” and “food security” are more common. In addition, a topic widely explored in Portuguese publications is the nutritional quality of the food consumed, especially in traditional communities and, in particular, among children.

Figure 3. Word cloud and term network of Portuguese texts.

3 Portuguese term denoting indigenous communities of African descent.

3.1.2 QUALITATIVE ANALYSIS

Using the frequency and relationship between terms from the quantitative analysis of the texts analysed in the three languages, the following concepts were selected for analysis, divided into the dimensions proposed by Bèné (2019):

i) food (food security and nutrition);
ii) social aspects;
iii) productive and environmental aspects; and
iv) economic and governance aspects.

The terms are described and contextualised according to the sources cited.

3.1.2.1 Food (food security and nutrition)

This category groups the concepts found that related to the need to guarantee fair and sustainable access to nutritious and safe food, respecting the cultural and social particularities of communities, especially in rural, indigenous and traditional settings. This theme ranges from the self determination of food systems (nutritional/indigenous sovereignty), to the availability and distribution of food (food inventory), to concerns about food insecurity and health risks arising from inappropriate food production and handling.

Table 1. Terms related to food issues.

Terms	Concepts
(Agro)food systems approach	An integrated perspective that considers all stages of the food chain, from production to consumption, including social, economic, environmental, food and governance impacts (FAO).
Nutritional / indigenous sovereignty	The right of indigenous communities to define their own food systems, based on their cultural traditions, ancestral knowledge and sustainable practices. Several authors mention this term, including Pilnik (2023), who discusses nutritional sovereignty in indigenous communities through traditional knowledge of the region's food plants and how these practices ensure food security and nutritional diversity. Santafe-Trancoso (2020), Ghirardi (2020), Garcia (2011) and Micarelli (2018) also discuss this concept and the threats facing nutritional/indigenous sovereignty in the Amazon.
Food insecurity	Lack of regular access to sufficient, safe and nutritious food for normal growth and development and an active and healthy life. This may be due to lack of availability of food and/or lack of resources to obtain it. Câmara (2024) and Correa (2021) focus on quilombola communities[4] and show that their food insecurity is expressed in difficulty accessing quality food due to poor socioeconomic conditions. Pérez-Marulana (2023) highlights that public policies do not provide adequate support to communities, which increases their nutritional and social vulnerability.
Food profile	Food consumption patterns of a population, considering socio-economic, cultural and environmental factors. The concept is usually presented by focusing on specific traditional or indigenous communities or by considering the impacts and the relationship with environmental aspects. Moraes (2022) and Jardim (2020) explore how socio-economic and cultural shifts impact the dietary profile of the Amazonian population, whose main foods are local products such as fish and cassava, but also, increasingly, ultra-processed products. Correa (2021), Costa (2013) and Medeiros (2021) also mention some differences between rural and urban diets. Uribe-Calad (2022), Vega (2024) and Tápia-Arias (2024) add comments on food availability and consumption correlated with the impacts of climate change and globalisation.
Food inventory	The detailed management and recording of available food, its storage, distribution and consumption, especially during crises or situations of food insecurity. The characteristics of foods, such as perishability, are considered when using the concept and actions related to food safety. Giedelmann (2022) addresses the concept of the food inventory in the context of supply chains. He stresses that inventory management strategies help to ensure food security during crises.
Health risk	With regard to food, health risk refers to threats to human health arising from contamination, improper handling or lack of hygiene in the production and distribution of food.

4 Quilombolas is the term for people of African descent who live in the quilombos in Brazil.

3.1.2.2 Social aspects

The social category addresses the interrelationship between local/indigenous communities and natural resource management, based on ancestral knowledge, adaptive social and cultural practices. All concepts highlight the importance of traditional knowledge and how indigenous communities, through their perception of environmental and social changes, respond and adapt to current challenges.

Table 2. Terms related to social issues.

Terms	Concepts
Perception of Indigenous Peoples	How indigenous communities understand and experience changes in their food systems, including the effects of climate change and government policies. The concept incorporates values such as harmony with nature, cultural significance, sustainability, health and human life, as well as strengthening community and social ties. The work of Arotoma-Rojas (2022) highlights the importance of assessing the cultural and psychological dimension of food system participants' perception of climate change and its consequences, especially indigenous communities. Heredia-R (2020) conducted a study to evaluate sustainable practices in indigenous and mestizo communities in Ecuador, and found that indigenous people adopt them although they do not exist as a facet of their psychological behaviour.
Traditional knowledge	Ancestral knowledge on the use, management and conservation of native plants for food, medicine and ecological sustainability. Pilnik (2023) explores indigenous knowledge about native food species and highlights the importance of conserving this knowledge for food diversity, the preservation of sociobiodiversity and sustainable practices.
Commons	Natural resources such as water, forests and land that are managed collectively by local communities. The characteristics of non-exclusion and rivalry are seen as implicit in the works and reflect concerns about depletion, overuse of these resources and conflicts of use. Micarelli (2018) and Peralta (2023) highlight the concept of commons in the aspect of natural resources, such as water and forests, and how these are managed in local communities, with collective management being central to the resilience of food systems.
Social and cultural innovation	Processes by which local communities adapt and transform their social and cultural practices to cope with contemporary challenges, such as environmental and economic changes. Acosta-Muñoz (2020) analyses social and cultural innovation as a dynamic process in which local communities adapt their food and cultural practices in response to contemporary challenges. Romero-Mero (2023) says that the educational process is fundamental for indigenous communities to guarantee their food sovereignty. Contact with agricultural/agroecological schools seems to be important for strengthening communities, defending their rights and the environment.

3.1.2.3 Productive and environmental aspects

The central focus of these concepts is production dynamics. Production dynamics refer to the role of agricultural practices and natural resource management for sustainable production, ensuring food security and the economic resilience of communities, without compromising the natural environment.

Table 3. Terms related to production issues.

Terms	Concepts
Agricultural yields	Crop productivity measures in terms of quantity of production per unit area. This concept is key to assessing the efficiency and sustainability of agricultural practices. Benton (2019) discusses the paradox of the (non-systemic) view that increasing productivity, intensifying trade and lowering food prices would ensure food security. The author hypothesises that while increased productivity actually lowers food prices and increases food availability, the costs of negative externalities from increased health problems, such as obesity and environmental impacts, decrease the efficiency of the food system. In Colombia, Pérez-Marulanda and Castro-Núñez (2023) identified a small correlation (20%) between livestock production and child undernutrition.
Traditional farming systems	Agricultural practices established over time by local and indigenous communities, including techniques such as agroforestry, soil management and shifting cultivation. The system is characterised by small-scale production, adaptation to local conditions, biodiversity and sustainability. Heredia-R (2022) analyses the agricultural system of four traditional communities in the Amazon and highlights that these systems are important for food security and local sovereignty, as they promote biodiversity conservation and sustain local economies. Coutinho (2019) also emphasises the contribution of traditional farming systems to climate change resilience.
Agrobiodiversity	Variety and variability of living organisms that are essential for agriculture and food production, including crops, livestock, insects, and microorganisms. Schramski (2022) links agrobiodiversity to everyday practices promoted by social networks of food exchange between riverside communities, contributing to food security, ecological resilience and the behavioural economics of these communities.
Co-production	A collaborative approach in which multiple actors, such as farmers, NGOs, and local communities, work together to generate mutual benefits, such as food production and the provision of ecosystem services. Resque (2021) addresses the concept of co-production of ecosystem services in the Amazon in which smallholders collaborate with other actors to promote sustainable agricultural practices and shows that co-production is important for conservation and supports the resilience of local food.
Bioeconomy	It refers to the use of renewable biological resources, biotechnological knowledge and sustainable practices to produce food, energy and industrial products in an environmentally friendly way. We have seen this concept in grey literature published by international development actors and in interviews, but it is rarely mentioned in the literature on food systems in the Amazon (World Economic Forum).

Agroecological transition	The process of shifting from conventional farming practices to more sustainable and resilient approaches based on agroecological principles, including crop diversification, the use of ecological methods and the integration of traditional knowledge. Souza (2021) and Peralta (2023) analysed the impacts on sustainability and food security of family farmers adopting agroecological practices. Arce (2023) and Romero-Mero (2023) also address this issue, showing how agroecological transition involves the integration of traditional knowledge with modern innovations. The authors note that several regions of the Amazon have environmental problems due to the exploitation they have suffered.
Indigenous agriculture	The traditional agricultural practices of indigenous communities, characterised by the sustainable management of natural resources, the use of techniques such as agroforestry, and respect for biodiversity. Alves (2001) analyses indigenous agriculture in the Amazon and shows that practices such as agroforestry and the controlled use of fire represent a sustainable management model adopted by indigenous communities, which preserves biodiversity and guarantees their food security.
Sustainable behaviours	Practices and behaviours that promote the responsible and conscious use of natural resources, thus ensuring that they are available to future generations. Heredia (2020) investigates "sustainable behaviours" in traditional communities in the Amazon, highlighting how everyday practices, such as sustainable natural resource management and the promotion of dietary diversity, are essential for ecological resilience and food security.

3.1.2.4 Economic aspects and governance

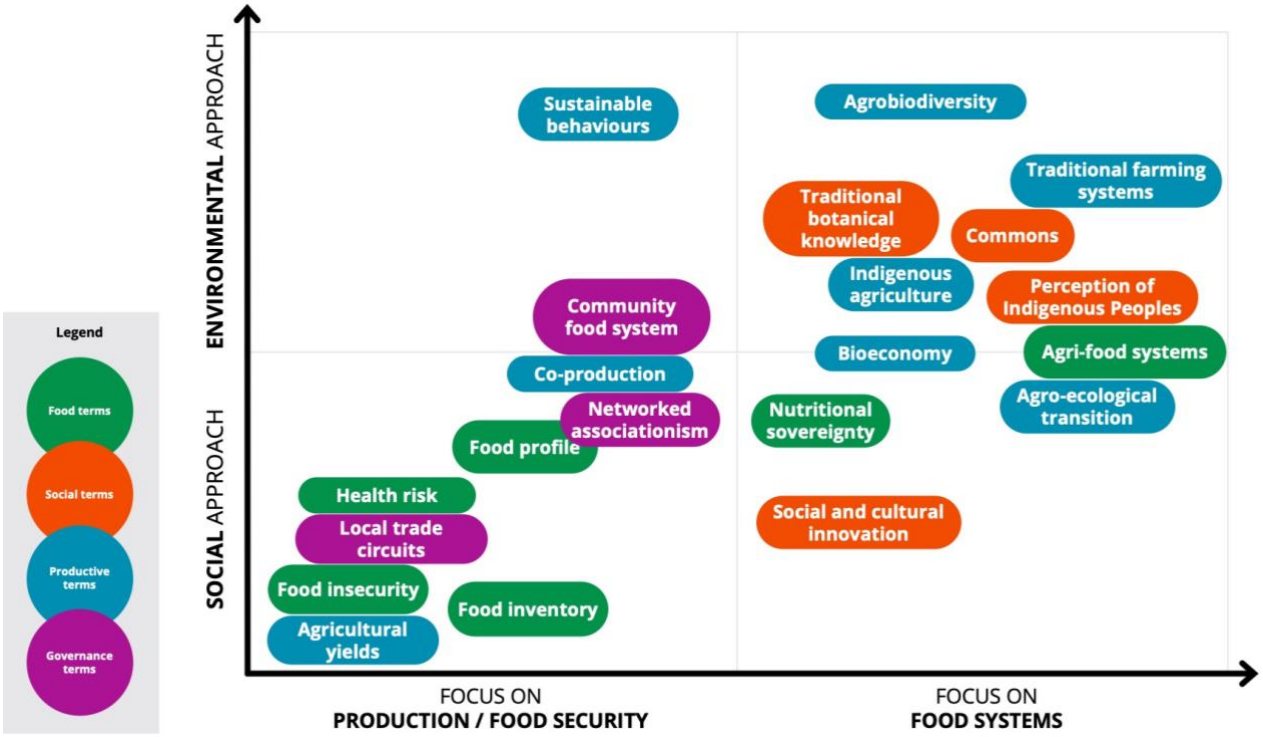
The concepts addressed in this thematic line address the management and organisation of food systems from a perspective that emphasises collective coordination and local autonomy in order to strengthen sustainability and food security.

Table 4. Governance-related terms.

Terms	Concepts
Networked associationism	A form of collaborative organisation in which diverse groups and individuals come together to achieve common goals, such as promoting food security and sustainability. For Ghirardi (2020), networked partnerships are a form of social and economic organisation that involves collaboration between different groups and individuals around common goals. Ghirardi explores the role of networked partnerships in promoting food and nutrition security through agroecological and solidarity economy practices, thus strengthening the link between producers and consumers and promoting sustainability and food sovereignty.
Community food system	Food production, distribution and consumption systems managed and controlled by local communities, based on traditional and sustainable practices. Sherman (2015) investigates the vulnerability and adaptive capacity of community food systems in the Peruvian Amazon, highlighting how local communities face challenges related to extreme weather events.
Local trade circuits	An alternative to conventional food systems characterised by long production and distribution chains. In local circuits, the distance between producer and the consumer is shortened, establishing a more direct and transparent relationship. Aquino (2020) discusses the importance of short trade circuits in promoting food security and reducing dependence on external markets, emphasising how these circuits strengthen family farming and promote sustainability, while reducing the carbon emissions associated with food transport.

These concepts can be organised in a matrix, with X-axis ranging from a productivist to a systemic approach, and the Y-axis plotting a predominantly social and an environmentally focused approach. This matrix shows the relative positions of the concepts, providing a clearer appreciation of how each is positioned on the spectrum of approaches and priorities. The diagram below provides an overview of this positioning, facilitating a comprehensive understanding of the current state of the discourses in which these terms are used.

Figure 4. Matrix of approaches to the terms evidenced.



The graph reveals two key approaches in the narratives on Amazonian food systems: one centred on a holistic and integrated vision, the other more linked to productivist dynamics.

In the food systems approach, the emphasis is on the preservation and strengthening of traditional systems, where food production is deeply connected to cultural values and sustainable practices. This approach underlines the importance of ensuring access to healthy and culturally appropriate food, protecting ancestral knowledge and respecting indigenous worldviews. The management of food systems by local communities, in harmony with their territories and traditions, reflects a holistic vision that integrates the natural and human environment, and conceptualizes the environment as an essential part of their worldview.

Conversely, terms related to food security dynamics adopt a perspective that focuses more on systemic production. Here, the emphasis is on aspects such as agricultural yields, influenced by global market pressures and public policies that seek to maximise large-scale production. However, terms such as "food inventory" reflect the key concern of ensuring food availability for the most vulnerable groups, highlighting an important social dimension of this productivist approach.

Regarding governance-related terms, the need for active participation and decentralisation to strengthen the social resilience of food systems is highlighted. Collaboration, local empowerment and autonomous decision-making are essential to achieve fair and sustainable resource management, thus contributing to food security and the wellbeing of Amazonian communities.

3.1.3. COMPARATIVE ANALYSIS

Our comparative analysis of country discourses on food systems considered the above-mentioned academic literature in combination with a brief analysis of the national 'pathways' of the countries in the region (UN Food Systems Coordination Hub, 2021). In these documents, the regional governments outlined their visions and future actions after the 2021 Food Systems Summit. The analysis showed both similarities and significant differences in each country's approaches and priorities. Despite sharing the vast Amazonian territory, their perspectives on food systems vary due to political, economic, social and cultural factors.

In terms of production systems, Brazil and, to a lesser extent, Peru and Ecuador have promoted agroindustry and large-scale production. Guyana and Suriname have a market-regulated, medium-scale agroindustrial growth approach. Countries such as Bolivia and Colombia have placed greater emphasis on family farming. Throughout the region, there is a tension between economic development and environmental conservation. Brazil and Ecuador face serious criticism for their management of natural resources.

Regarding food approaches, the Bolivian and Colombian governments have adopted a discourse of food sovereignty. This discourse prioritises self-sufficiency and sustainable agricultural practices. This aspect is strongly linked to the role of indigenous communities, where their traditional knowledge and sustainable agricultural practices are valued and promoted in national discourses. By contrast, Venezuela, Peru, Ecuador and Brazil focus more on food security, particularly in response to economic crises or global demand for agricultural products. In the case of Venezuela and Brazil, the conflicting demands of agricultural expansion and indigenous rights remain an issue that generates tension.

4. Who participates in food systems in the Amazon region?

Amazonian food systems involve a wide variety of actors whose roles and dynamics shape the food production and distribution scenario in the region. These include indigenous communities, smallholders, peasants, NGOs, local governments and agribusinesses, each with their own interests and ways of interacting. The following lists these actors and provides examples of their interrelationships.

Table 5. Analysis of food system participants.

Category of actors	Actors
Primary producers *Actors directly involved in food production*	**Indigenous communities** practising traditional agriculture, hunting, fishing and gathering. **Afrodescendant communities** practising traditional agriculture. Peasants and smallholders growing local produce such as cassava, bananas and maize. **Agroindustrial companies** operating large plantations or livestock farms.
Intermediaries and distributors *Actors responsible for the collection, processing and distribution of the food produced.*	**Local traders** who buy foods from producers and sell them in local markets. **Cooperatives or associations** that bring together small producers to improve marketing. Land and river **transport companies** that distribute food to different regions.
Consumers *Actors who purchase and consume the food produced***.**	**Local communities** consuming subsistence products or food sold in markets. **Urban populations** in the Amazon region, or beyond it, that buy Amazonian products. In global markets there is an increase in ethical consumers looking for sustainably produced food.
Government and non-governmental organisations (NGOs) *Actors influencing the regulation, support or monitoring of food systems.*	**Local and national governments** creating policies for agricultural and food production, such as subsidies or land regulation. **NGOs** promoting sustainable practices, food security or the defence of the rights of indigenous and peasant communities. **Organisations and assistance programmes** that distribute food in situations of need.
Researchers and academics *Actors who study and produce knowledge on food systems and their sustainability*	**National and international universities** that analyse social and environmental dynamics, climate change and its impact on food production. **National and international research centres** studying new agricultural technologies to improve production efficiency and sustainability.
Extractivism actors *Actors whose main activity is the exploitation of natural resources, such as mining, logging and deforestation-related activities, which directly or indirectly influence food systems.*	**Mining companies** extracting gold, oil and other minerals in the region. **Logging and deforestation companies** clearing large areas of forest for timber or expanding areas for industrial agriculture. **Illegal extractive groups** engaging in illegal activities such as coca production, generating serious environmental and social impacts.

Interactions between actors in the Amazon are complex due to the diversity of participants at different levels. These interactions shape how food is produced, distributed and consumed in this vast and ecologically rich area.

A clear example of these interrelationships is the change in dietary patterns in rural areas, driven by industrialisation. The expansion of activities such as agribusiness, mining and deforestation has altered local ecosystems, reducing the availability of traditional foods such as fish, wild fruits and subsistence farming products. This may be related to increased consumption of processed and market-bought foods, which are often less nutritious, as well as undermining traditional food practices and affecting the food sovereignty of rural communities.

In contrast, a positive aspect is the recent interest of some Amazonian governments and international NGOs in listening to and supporting indigenous communities. These supportive interventions are manifested in initiatives where the main objective is to build up the capacities of indigenous peoples, defend their rights and preserve their cultural traditions and ancestral knowledge. Policies and programmes designed to empower communities to manage their resources, improve access to basic services and encourage their participation in decision-making about their territories are gaining ground. NGOs, for their part, play a key role in documenting rights violations and in promoting social justice; they work closely with communities to ensure that their voices are heard and their rights respected, especially in a context of increasing pressure due to the exploitation of natural resources.

For example in Brazil, where in 2023 the government re-established the National Foundation of Indigenous Peoples (FUNAI), enhancing its role in protecting the territorial rights of indigenous communities, and in Ecuador, where since 2019 actions have been intensified in the Yasuní National Park, involving local communities in its management and protection. Meanwhile, in 2020 the international NGO, the World Wildlife Fund (WWF), launched the Amazon Indigenous Rights and Resources programme, which seeks to empower indigenous peoples in the management of their territories and natural resources.

5. What are the dynamics affecting food systems in the Amazon region?

To fully understand Amazonian food systems, it is essential to examine the dynamics that affect them, together with the challenges and opportunities that arise in this unique context. We identified five types of dynamics that have an impact on Amazonian food systems, these include: (1) demographics, such as the flow of people between the jungle and the cities of the Amazon; (2) technology, such as the rise of highly technical industrial agriculture; (3) markets, such as resource extraction and global markets; (4) climate and the ways it is changing the environment and generating climatic shocks such as heatwaves, excess rainfall or droughts' and (5) politics, such as conflicts, inequalities and governance.

Highlights include increasing urbanisation, technological innovations in agriculture, changing consumption patterns and environmental pressures such as deforestation and climate change. Urbanisation increases demand for processed foods and changes eating habits, while technology offers opportunities for sustainable increases in productivity. However, these dynamics also bring challenges, such as the need to integrate sustainable practices and ensure fair access to food. Understanding these interactions is crucial to developing strategies that promote more sustainable, inclusive and resilient food systems. The following table presents the predominant dynamics of the region.

Table 6. Predominant dynamics in the Amazon region that impact on food systems.

Dynamics	Description
Demographics	
Local knowledge systems	Local knowledge systems in the Amazon, including **indigenous communities, mestizos, Afrodescendants and farmers**, have historically been marginalised in research and policy, even though they offer sustainable and accessible solutions. This knowledge often challenges the capitalist model of development and is threatened by the immigration of outside groups who introduce new practices that disrupt local traditions. Emigration and changes in livelihoods threaten the transmission and continuity of these vital knowledge systems (interview with Emil Siren Gualinga, indigenous leader).
Urban-rural flows	In the Amazon, "*many people move between urban and rural areas, maintaining homes in both places due to the lack of services in the jungle and the supply of education, employment and health care in the cities*" (Tita Alvira, Ecologist and expert on Amazonian indigenous communities). This movement is complemented by the migration of **external groups, such as food producers and religious communities**, which has altered traditional ways of life and food systems, changing the dynamics between cultural and agricultural aspects (interview with Emil Siren Gualinga, indigenous leader). However, the connection between rural and urban life continues to influence access to resources in both areas.
Technology	
Agricultural technologies	Technologies to increase agricultural productivity. These technologies are often used in large-scale monocultures **mainly by agribusiness companies** (e.g. genetically enhanced seeds), have expanded the agricultural frontier, and have reduced soil quality.
Markets	
Global markets	Market integration offers economic opportunities and infrastructure improvements **for local and indigenous communities**, although its impact varies across value chains. Crops such as palm oil, soy and timber[5], dominated by large, capital-intensive actors, can exclude local communities from meaningful participation. By contrast, products such as cocoa and coffee facilitate the integration of these communities in global markets, but the shift from subsistence production to cash crops can lead to overexploitation of resources, may exacerbate social inequalities and increase vulnerability to price fluctuations and food insecurity (conversation with Tita Alvira, ecologist and expert on indigenous communities in the Amazon).
Resource extraction	Capital-intensive **extractive industries** have a profound impact on local food systems as they reduce the land available for traditional agriculture and disrupt ecosystems that are vital to community diets and livelihoods (discussions with Tita Alvira and WFP Country Directors). The clearing of forests and degradation of water courses that are essential for fisheries and non-timber products, diminish food sources. Furthermore, pollution and environmental damage from these operations threaten the food security and health of communities. Social problems, such as increased crime and prostitution near extraction sites, also intensify the challenges faced by these populations.

[5] According to WWF in Colombia, 50% of traded timber is illegal. The lack of regulation leads to overexploitation of this resource.

Climate	
Environment	The region faces major threats due to climate change and environmental degradation, such as deforestation, forest fires, soil erosion and rising temperatures (WWF). These disruptions, along with more frequent droughts and floods, are leading to biodiversity loss and negatively affecting the food system. **Small-scale food producers and the informal food sector** are particularly vulnerable, facing an increasing risk of food insecurity. Furthermore, the expansion of the carbon market raises questions about the real benefits for local communities, as some programmes provide support, while others do not offer significant benefits (interview with Nkiwi Flores, indigenous leader).
Politics	
Conflicts	Conflicts in the Amazon include not only armed violence, but also illegal activities such as drug trafficking, mining and illegal logging, which severely affect rural livelihoods. These activities displace **Indigenous Peoples, local communities and farmers**, forcing them to leave their land and, in some cases, to work for illegal actors, thus perpetuating the exploitation (conversation with Tita Alvira). The destruction of agricultural assets, disruption of local markets and rising food prices exacerbate hunger and malnutrition, which undermines traditional food systems and deepens the social and economic instability of the region.
Inequalities	The Amazon is characterized by acute inequalities, both between rich and poor and between urban and rural areas. Cities often provide better access to services such as education, health care and markets, while rural communities face significant barriers in these areas (Focus Group with WFP Country Offices). However, food insecurity is more prevalent in urban areas, where people rely on purchased food, while rural populations often grow their own food, which provides a buffer against food shortages (FAO, 2024). Industrial agriculture exacerbates inequality by reducing the land available for local production, thus marginalising **indigenous and rural communities** and threatening their traditional livelihoods.
Governance	Governance in the Amazon is complicated by overlapping legal frameworks, conflicting incentives and inconsistent application of policies, leading to gaps and contradictions in implementation (WFP Country Office Focus Group). These problems contribute to the persistence of illegal activities such as deforestation, mining and land grabbing; **government** corruption further aggravates the situation, undermining efforts to balance economic development with environmental conservation. In many areas, the lack of effective governance encourages the proliferation of illegal activities and conflicts. Although **indigenous communities and local organisations** play a vital role in defending the environment and traditional rights, their efforts are often limited by these governance challenges (Focus group with WFP Country Offices and discussions with Tita Alvira).

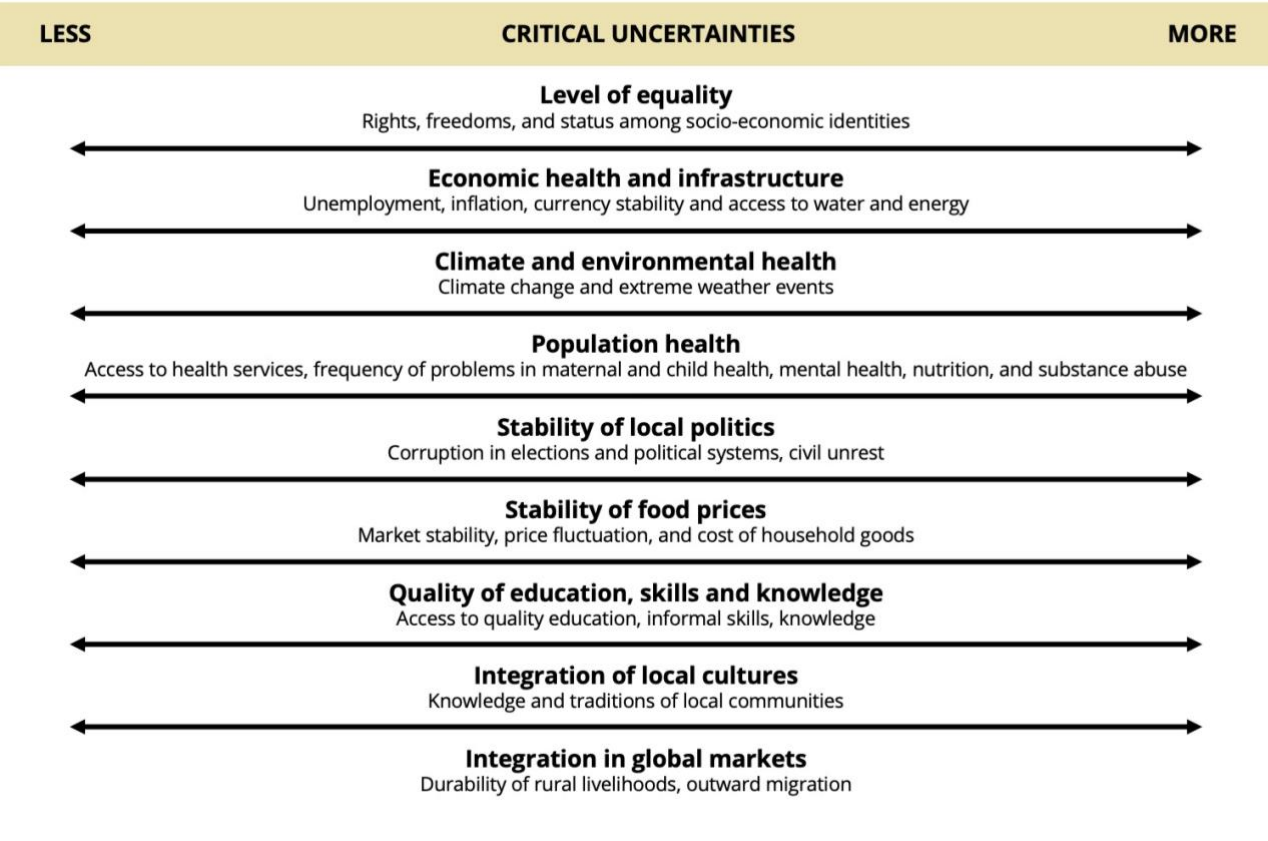
Furthermore, the Amazon region faces increasing shocks that threaten its food systems, including major disruptions such as the COVID-19 pandemic and economic recessions. These events intensify vulnerabilities by disrupting local supply chains, exacerbating inequalities and undermining the sustainability of traditional practices. For example, the COVID-19 pandemic revealed and exacerbated problems such as supply chain disruptions, market access and labour shortages, thus intensifying pre-existing challenges in the region.

In conclusion, the dynamics affecting food systems in the Amazon region are complex and multifaceted. The interaction between industrialisation, exploitation of natural resources and changes in consumption and production patterns influences food availability and sustainability. Extractive activities and the expansion of industrial agriculture have profoundly disrupted local ecosystems, while conflicts, both legal and social, and the impacts of climate change further aggravate the situation (WWF and conversations with Tita Alvira). Despite these challenges, opportunities also emerge through the support of governments and NGOs, which seek to build local capacities and promote sustainable practices. Urban-rural interconnectedness remains a key factor in shaping food systems, reflecting a network of influences that require coordinated attention to ensure food security and sustainability in the Amazon region.

6. How are the possible futures of food systems in the Amazon region perceived?

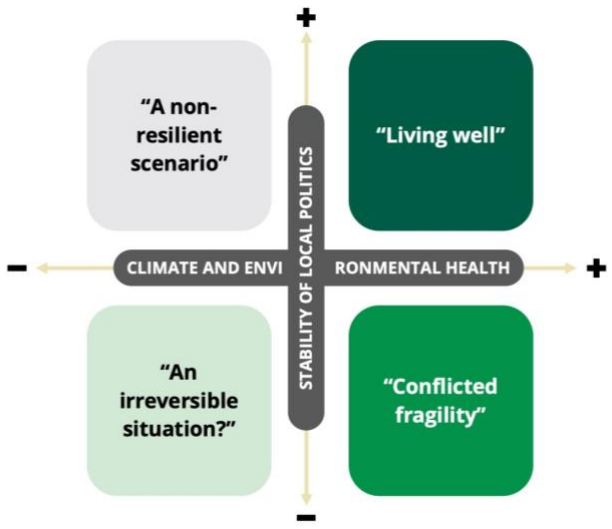
In the workshop on Exploring Future Scenarios for Food Systems in the Amazon region, we presented participants with a number of critical uncertainties, factors whose development is essential, but which could significantly influence the future of these systems. We provide a preliminary identification of these uncertainties, based on the dynamics outlined in the previous section.

Figure 5. List of critical uncertainties for food systems in the Amazon region.



The participants selected two uncertainties: **"Health of the climate and of the environment"** and **"Local policy stability"** as key elements for the future of food systems in the Amazon. These uncertainties served as the foundations for the construction of four future scenarios, facilitating discussion of possible development paths and action strategies. We divided the participants into four groups and assigned each group to one of these scenarios. Each group discussed and defined what Amazonian food systems would look like in their scenario.

Figure 6. Future scenarios generated for food systems in the Amazon region.



6.1 Scenarios described

6.1.1 A NON-RESILIENT SCENARIO

By 2050, the health of the climate and the environment decreases, while the stability of local politics increases. Environmental collapse could not have come at a worse time for the Amazon region. Residents feel the impacts on their livelihoods. The impact on local food systems is negative. Access to food is now limited, scarce and of poor quality.

A new government policy is introduced to strengthen control over production chains. The main policy failures have been the invisibility of indigenous peoples and their exclusion. The effect on local communities is insufficient, negative, controversial and conflictive, leading to the expropriation of local knowledge.

Civil society and NGOs are turning their attention and efforts to devising policies that foreground the voices of communities, generating knowledge that contributes to increasing climate and economic resilience and overcoming inequality. Communities cannot take a leading role and operate with autonomy. Large food companies continue with their same practices, producing ultra-processed food, while informal and/or local traders remain on the margins, invisible and facing more difficulties. The impact on consumers is reduced access to quality products, fair prices, less healthy products, leading to an increase in negative adaptation strategies. Indigenous and local communities have adapted, but suffer from obesity. Their traditional ways of life cannot survive.

Figure 7. Illustration of “a non-resilient scenario”.

Source: Image created with Chat GPT. We added the main features of the scenario in terms of climate and environmental health, political stability, and the effects on the lives of indigenous communities.

6.1.2 LIVING WELL

By 2050, the health of the climate and the environment improves, as does the stability of local politics. The conservation and sustainable development boom could not have come at a better time for the Amazon region. Residents feel the impacts on their lives, as well as on their food security and nutrition. The impact on local food systems is sustainable. Access to food is now guaranteed and is culturally appropriate.

The government has introduced a new policy that respects traditional forest-dependent populations. The main policy achievements have been the securing of rights to land, territories and natural resources. The effect on local communities is ideal and participatory. Civil society and NGOs are focusing their attention and efforts on social[6] and regenerative technologies. They can strengthen sustainable practices and applied technologies, thus valuing livelihoods. Large food companies have shifted to practices that do not destroy health and natural resources, while informal and/or local traders have adopted fair, equitable and healthy trade practices. The impact on consumers is improved health and increased access to healthy food. Indigenous and local communities have adapted by developing resilient ways of using their resources. They are able to strengthen their territorial and participatory governance.

Figure 8. Illustration of "living well".

Source: Image created with Chat GPT. We added the main features of the scenario in terms of climate and environmental health, political stability, and the effects on the lives of indigenous communities.

6 Workshop participants defined the term "social technologies" as the use of technologies/ technological devices, such as mobile phones, that have an impact on people's interactions and behaviours, and affect the way they communicate in person.

6.1.3 AN IRREVERSIBLE SITUATION?

By 2050, the health of the climate and the environment declines, and the stability of local politics also declines. Environmental collapse could not have come at a worse time for the Amazon region. Residents feel the impacts through rural exodus, loss of natural resources, lack of financial resources, and cultural and emotional effects (mainly on women) and on the young population. The impact on local food systems is irreversible. Access to food is now limited.

A new government policy is introduced to promote agroforestry systems. The main policy failures have been the lack of continuity of programmes in all states, due to problems of access to natural resources. The effect on local communities is that rural areas have been abandoned, there is little room for innovation and difficulty in stabilising the situation in the countryside. Civil society and NGOs are directing their attention and efforts to addressing the lack of public services and policies. It is difficult for NGOs to reach out to communities given the instability of rural areas.

Large food companies continue to dominate production and supply structures, while informal and/or local traders are unable to cope with the competition. The impact on consumers is access to food that is not adequate to ensure food security. Indigenous and local communities have been unable to adapt. They cannot guarantee their livelihoods.

Figure 9. Illustration of “an irreversible situation”.

Source: Image created with ChatGPT. We added the main features of the scenario in terms of climate and environmental health, political stability, and the effects on the lives of indigenous communities.

6.1.4 CONFLICTED FRAGILITY

By 2050, the health of the climate and the environment increases, while the stability of local politics decreases. The collapse of governments could not have come at a worse time for the Amazon region. Residents feel the impacts on their livelihoods, although climate resilience increases, while political instability disrupts trade and support systems. The impact on local food systems is negative. Access to food is now limited and unpredictable, leading to increased dependence on unsustainable practices and external aid.

A new government policy is introduced to support sustainable land use and improve food security and dietary diversity. The main policy failures have been the lack of consultation with local communities and insufficient allocation of resources for implementation. The effect on local communities is a growing unease and sense of dispossession, as their needs continue to be ignored in favour of broader agendas. Civil society and NGOs are directing their attention and efforts to addressing food insecurity and environmental degradation. They are unable to fully coordinate their initiatives due to fragmented funding and political instability, which hampers their effectiveness. Large food corporations continue to engage in practices that prioritise profit over sustainability, often driven by corruption and collusion with political entities, while informal and/or local traders continue to rely on community networks for their survival. The impact on consumers is higher prices and reduced access to a variety of foods.

Indigenous and local communities have adapted by maintaining their traditional agricultural knowledge and practices. They are now forced to confront broader issues related to their rights and access to land. Political instability and external pressures continue to threaten their livelihoods.

Figure 10. Illustration of “conflicted fragility”.

Source: Image created with ChatGPT. We added the main features of the scenario in terms of climate and environmental health, political stability, and the effects on the lives of indigenous communities.

6.2 Points of convergence between the different scenarios

Finding points of convergence between different future scenarios is important for designing robust and flexible strategies that work in a variety of future contexts. These commonalities enable shared action areas to be identified, resources to be optimised and uncertainty to be reduced by focusing on effective solutions for multiple scenarios. In addition, they facilitate strategic decision-making by providing a solid and adaptable basis, promoting collaboration between governmental actors, local communities, the private sector and international organisations. Anticipating common risks enhances the resilience of systems and facilitates a balance between innovation and sustainability.

6.2.1 VALUING THE LIVELIHOODS OF RURAL POPULATIONS

All scenarios emphasise the need to value and respect the traditional livelihoods of rural populations. These livelihoods are linked to their relationship with the land and nature, and are essential to their cultural and economic survival.

6.2.2 PARTICIPATION OF INDIGENOUS PEOPLES

In the different scenarios, the importance of ensuring that indigenous peoples participate in decision-making is emphasised. The exclusion of these communities creates conflict and inequality, while their active participation is seen as a key step towards fairer and more sustainable development.

6.2.3 GUARANTEED ACCESS TO NATURAL RESOURCES AND LAND RIGHTS

Security of access to natural resources and land rights are recurrent elements in the scenarios. Guaranteeing these rights is fundamental to the survival of indigenous communities and to ensuring the sustainability of the ecosystems they inhabit.

6.2.4 SOCIAL TECHNOLOGIES AND THE ROLE OF INDIGENOUS KNOWLEDGE

Highlights the importance of developing and applying social and regenerative technologies that value and enhance the ancestral knowledge of indigenous peoples. Raising the voice of these communities, generating inclusive knowledge and promoting their traditional practices are key to achieving effective climate and social resilience.

7. Conclusions

Analysis of food systems in the Amazon reveals the profound complexity and diversity of approaches to the region. Discourses on these systems vary significantly across countries, cultures and sectors, but **they share a common concern: how to balance environmental sustainability with the growing demands of food production**. In Brazil, for example, industrial agricultural expansion is a dominant theme, while in other areas of the Amazon a more community-based and preservation-oriented approach to traditional knowledge prevails. I**n all cases, Amazonian food systems cannot be understood only as productive processes, but as integrated systems that encompass social, cultural and ecological dimensions.**

The actors involved in these systems also reflect this diversity. From indigenous communities and smallholders to large agribusiness corporations, each plays a key role in shaping the region's food system. The interaction between these actors, although sometimes cooperative, is often conflictive, reflecting competing interests between economic development and environmental conservation. NGOs, universities and local governments also play a key role in influencing the governance and sustainability of the systems.

The dynamics affecting Amazonian food systems are equally complex. Demographic factors, such as rural-urban migration, emerging technologies in agriculture, and global markets that favour certain cash crops over local production, are rapidly transforming the region. Added to this are growing environmental pressures, such as deforestation and climate change, which threaten to further destabilise an already vulnerable system. The governance of this vast ecosystem is extremely complex. The Amazon encompasses multiple nation states, each with different, often competing visions and priorities within the same country, where economic growth driven by natural resource exploitation clashes with efforts to protect the environment. **This tension between development and conservation creates power vacuums**, occupied by a multitude of actors, from local communities establishing their own management structures, to illegal actors, such as miners and loggers, operating outside the law.

From the perspective of key actors in the region, climate uncertainties and the stability of local policies are identified as critical to the future of food systems. The ideation of futures has been a useful tool for identifying points of convergence that lead to possible courses of action. **The interconnectedness of these scenarios suggests that the future of the Amazon region is profoundly influenced by the health of the environment, government policies, the role of civil society, and the living conditions of local communities.**

We are at a tipping point. We cannot reverse the damage of the past or change the realities of the present, but we have the capacity to shape the future. By better understanding Amazonian food systems, their actors and the forces that shape them, we can begin to devise solutions that promote resilience. **It is essential to consider the role of local communities and their ancestral knowledge in these solutions, as well as the alignment of new agricultural technologies with sustainability principles**. Ensuring that Amazonian food systems not only survive, but thrive in the face of the challenges ahead, is a crucial objective. The key to a sustainable future appears to lie in the inclusion of all voices, especially those of indigenous peoples, and the implementation of policies that respect their rights and promote sustainable practices.

These discussions are an essential starting point for thinking about the future of food systems in the Amazon. Only through a holistic and cooperative approach among all stakeholders can we aspire to a future where the Amazon is an example of balance between development and preservation.

Bibliography

1. Acosta-Muñoz, L. E., Mendoza-Hernández, D., Cruz-Nazzar, P. E. (2020). **Los Indicadores de Bienestar Humano (IBHI): innovación social y cultural en la Amazonía colombiana. Estudio de caso departamento del Amazonas**. Libro de Actas - Akten Liburua - Conference Proceedings. V, pp. 817 - 841

2. Alves, R. N. B. (2001). **Características da agricultura indígena e sua influência na produção familiar da Amazônia**. Embrapa, Documentos 105

3. Anita M. McGahan, Leandro S. Pongeluppe (2023). **There Is No Planet B: Aligning Stakeholder Interests to Preserve the Amazon Rainforest**. Management Science 69(12):7860-7881.

4. Aquino T. P., Souza G. P. S., Aviz L. B. S., Simões A. V. (2020). **Aproximação entre agricultura e consumidores durante a pandemia da COVID-19: Experiências de pesquisa-ação em prol dos circuitos curtos de comercialização**. Revista do Núcleo de Meio Ambiente da UFPA

5. Arce. A., Piedad-Pareja, M. C. T., Sanchez-Choy, J. (2023). **Desarrollo de Indicadores Locales en el Corredor Pucallpa – Aguaytía Ucayali, PERU**. WP2 – Reporte de Taller, Iniciativa de Agroecología

6. Arotoma-Rojas, I., Berrang-Ford, L. Zavaleta-Cortijo, C., Ford, J. D., Cooke, P. (2022). **Indigenous Peoples' Perceptions of Their Food System in the Context of Climate Change: A Case Study of Shawi Men in the Peruvian Amazon.** Sustainability 14, 16502. https://doi.org/10.3390/su142416502

7. Behringer, J.; Feindt, P.H. (2023). **Varieties of food democracy: A systematic literature review.** Crit. Policy Stud. 1(27)

8. Béné, C., Fanzo, J., Prager, S. D., Achicanoy, H. A., Mapes, B. R., Toro, P. A., Cedrez, C. B. (2020). **Global drivers of food system (un)sustainability: A multicountry correlation analysis**. PLoS ONE 15(4): e0231071. https://doi.org/10.1371/journal. pone.0231071

9. Béné, C., Prager, S. D., Achicanoy, H. A. E., Toro, P. A., Lamotte, L., Cedrez, C., Mapes, B. R. (2019). **Understanding food systems drivers: A critical review of the literature**. Food Sec. 23, 149–159 (2019)

10. Benno Pokorny, Wil de Jong, Javier Godar, Pablo Pacheco, James Johnson, (2013). **From large to small: Reorienting rural development policies in response to climate change, food security and poverty**. Forest Policy and Economics, 36, p.52-59

11. Benton, T. G. & Bailey, R. (2019). **Agricultural productivity promotes food system ineficiency.** Glob. Sustain. 2, 1–8 (2019).

12. Bortoletti, M. & Lomax, J. (2019). **A Multi-Stakeholder Pathway for Sustainable Food Systems.** http://www.oneplanetnetwork.org/initiative/setting-table-our-children-improving-governance-food-systems

13. Câmara, J.H., Varga, I.V., Frota, M.T., & Silva, H.P. (2024). **Racism and food insecurity: misfortunes of a Quilombola community in the Brazilian Legal Amazon**. Ciencia & saude coletiva, 29 3, e16672023 .

14. Centre for Food Policy at City. London, UK and Washington D.C. 2022. (2022). **Taking a Food Systems Approach to Policymaking: A Resource for Policymakers**. London, UK and Washington D.C. 2022.

15. Correa, N. A., Silva, H. P. (2021). **Da Amazônia ao guia: os dilemas entre a alimentação quilombola e as recomendações do guia alimentar para a população brasileira.** Saude soc. 30 (1) • 2021

16. Corrêa, N. A., Silva, H. P. (2022). **Comida de Quilombo e a Desnutrição Infantil na Amazônia Paraense: Uma análise com base no mapeamento da Insegurança Alimentar e Nutricional**. Segurança Alimentar e Nutricional, Campinas, SP, v. 29, n. 00, p. e022020, 2022. DOI: 10.20396/san.v29i00.8670218.

17. Costa, L. (2013). **Alimentação e comensalidade entre os Kanamari da Amazônia Ocidental**. Mana 19 (3), Dez 2013

18. Coutinho, E. A., Guimarães, T. T. D. (2019). **Elementos sobre as transformações na Amazônia Brasileira e intervenções nos sistemas agroalimentares tradicionais**. Revista Terceira Margem Amazônia, 4(12).

19. Davis, J., Mengersen, K., Bennett, S. et al. (2014). **Viewing systematic reviews and meta-analysis in social research through different lenses**. SpringerPlus 3, 511 (2014).

20. Érika Cristina Francisco, Paulo Sérgio de Arruda Ignácio, Alessandro Luis Piolli, Maria Ester Soares Dal Poz (2023). Food-energy-water (FEW) nexus: **Sustainable food production governance through system dynamics modeling**. Journal of Cleaner Production 386(2023) 135825

21. FAO (2024). **Strengthening urban and peri-urban food systems to achieve food security and nutrition, in the context of urbanization and rural transformation - Executive Summary** https://openknowledge.fao.org/items/39d5ee64-97dc-4f59-95be-4b9536ca2af9

22. FAO, FIDA, OPS, WFP y UNICEF (2023). **Panorama Regional de la Seguridad Alimentaria y Nutricional—América Latina y el Caribe 2022: Hacia una Mejor Asequibilidad de las Dietas Saludables**. WFP: Santiago, Chile

23. Ferreira, J. N., Oliveira, K. A., Brito, M. B. U (2024). **Sistema agroalimentar: diagnóstico das ações para o desenvolvimento da agricultura familiar na Amazônia Sul Ocidentea**. UÁQUIRI 6 (1)

24. Freitas, A. C. R., Almeida, M. F., Kato, O. R. (2009). **Manejo Ecológico de Capoeiras e Produção de Alimentos por Agricultores Familiares no Bioma Amazônia do Estado do Maranhão**. Cadernos de Agroecologia [Volumes 1 (2006) a 12 (2017)]

25. Garcia, M. T., Granado, F. S., Cardoso, M. A. (2011). **Alimentação complementar e estado nutricional de crianças menores de dois anos atendidas no Programa Saúde da Família em Acrelândia, Acre, Amazônia Ocidental Brasileira**. Cad. Saúde Pública, Rio de Janeiro, 27(2):305-316, fev, 2011

26. Ghirardi, M. N. R., et al (2020). **Associativismo em rede: uma experiência de práticas para soberania e segurança alimentar no Nordeste Paraense – Amazônia - Brasil**. Anais do XI Congresso Brasileiro de Agroecologia, São Cristóvão, Sergipe. v. 15 n. 2 (2020):

27. Giedelmann-L, N. Guerrero, W. J. Solano-Charris, E. L. (2022). **System dynamics approach for food inventory policy assessment in a humanitarian supply chain**. International Journal of Disaster Risk Reduction 81.

28. González- Posso, D. (2001). **Coca, deforestation and food security in the Colombian Amazon region**. Unasylva 51(202) p. 32 - 36

29. Hanyu Liu, Wanglin Yan & Hikaru Kobayashi (2024). **Modelling the system dynamics of household food, water, and energy nexus effects**. Heliyon 10(2024) e25886

30. Hawkes, C. Brief I. (2022). **Taking a Food Systems Approach to Policymaking: What, How, and Why**. European Comission.

31. Heimo Mikkola (2024). **Aquaculture and Fisheries as a Food Source in the Amazon Region - A Review**. Food and Nutrition Journal 9(286)

32. Hendrigan, H. (2019). **Mixing Digital Humanities and Applied Science Librarianship: Using Voyant Tools to Reveal Word Patterns in Faculty Research**. Issues in Science and Technology Librarianship, (91). https://doi.org/10.29173/istl3

33. Heredia-R M, Torres B, Vasseur L, Puhl L, Barreto D and Díaz-Ambrona (2022). **Sustainability Dimensions Assessment in Four Traditional Agricultural Systems in the Amazon**. Frontiers in Sustainable Food Systems

34. Heredia-R. M., Falconí A. K., Barreto, D., Amores, K., H-Silva, J., Torres, B. (2020). **Conductas sustentables sobre el marco de evaluación SAFA - FAO: un aporte para poblaciones rurales vulnerables de la Amazonía**. RISTI, N.º E33, 08/2020

35. Homma, A. K. O., Santos, J. C., Sena, A. L. S., Menezes, A. J. E. A. (2014). **Pequena produção na Amazônia: conflitos e oportunidades, quais os caminhos?**. Amazônia: Ciência & Desenvolvimento, Belém, PA, v. 9, n. 18, p. 137-154, jan./jun. 2014.

36. IPES-Food. (2022). **ISmoke and Mirrors: Examining competing framings of food system sustainability: agroecology, regenerative agriculture, and nature based solutions**.

37. Jardim, C.M., Nardoto, G.B., De Lima, A.C., de Jesus Silva, R., Schor, T., de Oliveira, J.A., & Martinelli, L.A. (2020). **The influence of seasonal river flooding in food consumption of riverine dwellers in the central Amazon region: an isotopic approach.** Archaeological and Anthropological Sciences, 12.

38. Julius H. Kotir, Renata Jagustovic, George Papachristos, Robert B. Zougmore, Aad Kessler, Martin Reynolds, Mathieu Ouedraogo, Coen J. Ritsema, Ammar Abdul Aziz, Ron Johnstone (2024). **Field experiences and lessons learned from applying participatory system dynamics modelling to sustainable water and agri-food systems**. Journal of Cleaner Production 434(2024) 140042

39. Lamine, C.; Darnhofer, I.; Marsden, T.K. (2019). **What Enables Just Sustainable Transitions in Agrifood Systems? An Exploration of Conceptual Approaches Using International Comparative Case Studies**. J. Rural. Stud. 68, 144–146.

40. Le Coq J. F., Grisa, C., Guéneau, S. Niederle, P (2021). **Políticas Públicas y Sistemas Alimentarios en América Latina.** 1. ed. - Rio de Janeiro : E-papers, 2021. 550 p.

41. Livingstone, C., & Knezevic, I. (2020). **From Online Cart to Plate: What Amazon's Retail Domination Means for the Future of Food**. Journal of Agriculture, Food Systems, and Community Development, 9(4), 311–329.

42. Lott, V., Santana, C. L. (2021). **O saber fazer farinha: cultura alimentar na amzônia brasileira**. Vivência: Revista de Antropologia 57(1):

43. Soler, L. S., Kok, K.,Camara, G., Veldkamp, A. (2012). **Using fuzzy cognitive maps to describe current system dynamics and develop land cover scenarios: a case study in the Brazilian Amazon**. Journal of Land Use Science 7(2) p. 149-175

44. Machado, R. et al (2022). **Oficina educativa para profissionais da Atenção Primária à Saúde como estratégia para promover alimentação complementar saudável no Acre, Amazônia brasileira**. Saúde debate 46 (spe5) 27 Fev 2023Dez 2022

45. Maciel, M. M., Lima, V. S. (2023). **Alimentação escolar em escolas públicas do amazonas: uma revisão integrativa**. Revista Ibero-americana de Humanidades, ciências e educação (REASE). 11(9)

46. Maciel, V. B. S. (2021). **Diversidade alimentar de crianças indígenas de dois municípios da Amazônia Ocidental brasileira**. Ciênc. Saúde Colet. 26 (07) 02 Jul 2021Jul 2021

47. Maluf, R. S., Burlandy, L., Cintrão, R. P., Tribaldos, T., Jomalinis, E. (2024). **Food Systems and Access to Healthy Food in an Amazonian Context**. Sustainability 2024, 16(7), 2652; https://doi.org/10.3390/su16072652

48. Mateo Mier & Terán Giménez Cacho (2016). **Soybean agri-food systems dynamics and the diversity of farming styles on the agricultural frontier in Mato Grosso, Brazil**. The Journal of Peasant Studies 43(2) p. 419-441

49. Medeiros, A. C. S. (2021). **Perfil de consumo alimentar de população rural ribeirinha na Amazônia.** Manaus: Instituto Leônidas e Maria Deane, 2021. (Dissertação Mestrado)

50. Menezes I. C. D, Alves B. J. P. (2022). **Políticas de segurança alimentar e agroecologia na amazônia: olhares e narrativas roraimenses em disputa**. Amazônica Revista de Antropologia (ARA)

51. Micarelli, G. (2018). **Soberanía alimentaria y otras soberanías: los comunes y el derecho a la alimentación**. Vol. 54 Núm. 2 (2018): Misceláneo

52. Moraes, A.O., Magalhães, E.I., Orellana, J.D., Gatica-Domínguez, G., Neves, P.A., Basta, P.C., & Vaz, J. (2022). **Food profile of Yanomami indigenous children aged 6 to 59 months from the Brazilian Amazon, according to the degree of food processing: a cross-sectional study**. Public Health Nutrition, 26, 208 - 218.

53. Mullan, K., Sills, E., Pattanayak, S.K. et al (2018). **Converting Forests to Farms: The Economic Benefits of Clearing Forests in Agricultural Settlements in the Amazon**. Environ Resource Econ 71, 427–455 (2018)

54. Murrieta, R. S. S. (2001). **Dialética do sabor: alimentação, ecologia e vida cotidiana em comunidades ribeirinhas da Ilha de Ituqui, Baixo Amazonas, Pará**. Rev. Antropol. 44 (2)

55. Newton, P., Civita, N., Frankel-Goldwater, L., Bartel, K., Johns, C. (2020). **What Is Regenerative Agriculture? A Review of Scholar and Practitioner Definitions Based on Processes and Outcomes.** Front. Sustain. Food Syst., 25 October 2020. Sec. Agroecology and Ecosystem Services. Volume 4 - 2020

56. Oliveira, V. S., Alcântara, L. C. S., Barros, F. B. (2023). **Educação, políticas públicas e ações afirmativas rumo à equidade social: uma revisão sistemática de pesquisa e produção cientifica publicadas entre 2009 e 2019**. Revista Cocar. V.18 N.36 / 2023. p. 1-23

57. Parker, Christine; Johnson, Hope; and Curll, Janine (2019). **Consumer Power to Change the Food System? A Critical Reading of FoodLabels as Governance Spaces: The Case of Acai Berry Superfoods**. Journal of Food Law & Policy: Vol. 15 : No. 1 , Article 1.

58. Peralta, C., Monteiro, D., Apaza. A. (2023). **Bienes comunes para la transición ecológica justa en los sistemas alimentarios en América Latina**. Mundos Rurales, 16(1): 13-20. Agosto de 2023

59. Perez-Marulanda, L.; Castro Nunez, A. (2023). **Integrando la desnutrición infantil en la ganadería baja en emisiones de gases de efecto invernadero**. AgriLAC Resiliente Technical Report. 20 p.

60. Pilnik, M. S., Argentim, T., Kinupp, V., Haverroth, M., Ming. L. (2023). T**raditional botanical knowledge: food plants from the Huni Kui indigenous people, Acre, western Brazilian Amazon**. Rodriguésia, 17. April 2023.

61. Rego, A. K. C., Kato, O. R. (2017). **Agricultura de corte e queima e alternativas agroecológicas na Amazônia**. Novos Cadernos NAEA 3(20)

62. Resque, A.G., Piketty, M.G., Coudel, E., Messad, S., & Le Page, C. (2021). **Co-production of ecosystem services through agricultural practices: perception of stakeholders supporting smallholders in the Brazilian Amazon**. Cahiers Agricultures.

63. Rodomiro Ortiz, Andreea Nowak, Angela Lavado, Louis Parker (2013). **Food security in Amazonia A report for the Amazonia Security Agenda Project**. Report for Global Canopy Programme and International Center for Tropical Agriculture as part of the Amazonia Security Agenda project

64. Romero-Mero, G. (2023). **Formación agroecológica, política y pedagógica en la Amazonia ecuatoriana. Estudio de caso de la Escuela Amazónica de Agroecología del Movimiento Nacional Campesino**. Trabajo Fin de Máster Oficial en Agroecología: un enfoque para el desarrollo rural sostenible (2022/23) - Universidad Internacional de Andalucía

65. Rosa, M. Y. O., Borges, F. F., Júnior, L. N. C., Lobato, F. H. S. (2019). **O risco sanitário na comercialização de alimentos em um mercado público da Amazônia: um estudo de caso em Belém (PA)**. Scientia Plena 10(15)

66. Ruth Irene Arias-Gutiérrez, Roberto González-Sousa, Angelina Herrera-Sorzano, Manuel Pérez-Quintana, Elisa de la Bien Aparecida López-Cosme (2017). **Rural community's territorial system dynamics at the Anzu river valley in the Kichwa Amazon territory to propose change scenarios**. MOL2NET, International Conference Series on Multidisciplinary Sciences 3(2017)

67. Ruwer, C. M., Moura, J. F. , Gonçalves, M. J. F. (2011). **Surtos de doenças transmitidas por alimentos em Manaus, Amazonas (2005-2009): o problema do queijo coalho**. Segurança alimentar e nutricional, 2(18)

68. Santafe-Troncoso, V., & Loring, P. (2020). **Indigenous food sovereignty and tourism: the Chakra Route in the Amazon region of Ecuador**. Journal of Sustainable Tourism, 29, 392 - 411.

69. Santos, R. S., Azevedo- Ramos, C., Guedes, M. C. (2021). **Segurança alimentar de famílias extrativistas de açaí na Amazônia oriental brasileira: o caso da Ilha das Cinzas.** Novos Cadernos NAEA 2(24)

70. Schramski, S., Lima, A. C. B. (2022). **Fruitful exchanges: social networks and food resources amidst change**. Agriculture and Food Security, 11, 15 (2022)

71. Sherman, M., Ford, J., Llanos-Cuentas, A. et al (2015). V**ulnerability and adaptive capacity of community food systems in the Peruvian Amazon: a case study from Panaillo**. Nat Hazards 77, 2049-2079 (2015)

72. Sierra, R (2018). Food Production Systems in the Amazon. Selin, H. (eds) **Encyclopaedia of the History of Science, Technology, and Medicine in Non-Western Cultures**. Springer, Dordrecht

73. Silva, J. R. S. (2011). **Produção de commodities, dematamento e insergurança~alimentar na Amazônia Brasilieira**. Revista Geográfica de América Central, vol. 2, julio-diciembre, 2011, pp. 1-15

74. Silva, L. J. S., Oliveira, A. L. A., Santos, A. C. (2017). **Agricultura familiar no Estado do Amazonas: um panorama a partir do censo agropecuário 2017**. 61º Congresso da SOBER

75. Silva, L.H., Medeiros, M., Tavares, F.B., Dias, I.A.,Frazão, A.G.F (2020). **PNAE em tempos de pandemia: desafios e potencialidades para sua operacionalização no contexto amazônico**. Mundo Amazónico 11(2)

76. Silva, R. J., Garavello, M. E. P. E. (2012). **Ensaio sobre transição alimentar e desenvolvimento em populações caboclas da Amazônia**. Segurança Alimentar e Nutricional, Campinas, SP, v. 19, n. 1, p. 1–7, 2015. DOI: 10.20396/san.v19i1.8634664

77. Snyder, H. (2019). **Literature review as a research methodology: An overview and guidelines**. Journal of Business Research 104(2019) p.333-339.

78. Soares, K. R., Ferreira, E. E. S., Júnior, S. S., Neves, S. M. A. S. (2018). **Extrativismo e Produção de Alimentos como Estratégia de Reprodução de Agricultores Familiares do Assentamento Seringal, Amazônia Meridional**. Rev. Econ. Sociol. Rural 56 (4), Oct-Dec 2018

79. Souza, B. G. R. (2021). **Cacau orgânico, conservação ambiental, segurança alimentar e nutricional: o caso da Transamazônica, Amazônia, Brasil**. Agricultura e Agroindústria no contexto do desenvolvimento rural sustentável

80. Stefanovic, L., Freytag-Leyer, B. & Kahl, J. (2020). **Food system outcomes: An overview and the contribution to food systems transformation**. Front. Sustain. Food Syst. 4, 546167

81. Sylvester, J. M., Gutiérrez-Zapata, D,M., Pérez-Marulanda, L., Vanegas-Cubillos, M., Bruun, T. B., Mertz, O., Castro-Nunez, A. (2024). **Analysis of food system drivers of deforestation highlights foreign direct investments and urbanization as threats to tropical forests**. Scientific Reports 14 (2024) 15179

82. Tapia-Arias, R. A., Arias-Gutiérrez, R. I., Pérez-Quintana, M. L. (2024). **Adaptación cultural alimentaria en estudiantes indígenas amazonicos ecuatorianos**. Vol. 15 Núm. 1 (2024): Enero 2024 -Junio 2024

83. UN Food Systems Coordination Hub (2021). **Member State Dialogue Convenors and Pathways.** https://www.unfoodsystemshub.org/member-state-dialogue/dialogues-and-pathways/en

84. Uribe-Calad, A. F., Burgos-Bohórquez, F., Cruz, R. L., Acevedo-Correa, M. P., Galtier F., De Abad J. f., Herlant, P., Ruiz-Selvago, M. Ariza-Milanés, J. C (2022). **Perfil de sistemas alimentarios - Colombia Catalizar la transformación sostenible e inclusiva de nuestros sistemas alimentarios**. Rome : FAO-European Union - Cirad, 42 p.

85. Vega, C. V., Cielo. C. (2024). **Preciada comida: el rol relacional de la yuca en el sustento de poblaciones precarizadas en Ecuador**. Ecuador Debate N. 121, abril - julio 2024, p. 41 - 57

86. Verónica Santafe-Troncoso & Philip A. Loring (2021). **Indigenous food sovereignty and tourism: the Chakra Route in the Amazon region of Ecuador**. Justice and Tourism. 2021. Routledge

87. Wesz Junior, V.J.; Kato, K.; Rente Leão, A.; Leão, S.A.; Bezerra de Lima, M.D.S. (2021). **Dinâmicas recentes do agronegócio no Oeste do Pará (Brasil): Expansão da soja e estruturação de corredores logísticos**. Mundo Agrário 22, e174.

88. Xinkui Wang, Zengchuan Dong, Janez Sušnik (2023). **System dynamics modelling to simulate regional water-energy-food nexus combined with the society-economy-environment system in Hunan Province, China**. Science of The Total Environment 863 (2023) 160993

89. Xinqing Li, Lixiao Zhang, Yan Hao, Pengpeng Zhang, Xin Xiong, Zhimin Shi (2022). **System dynamics modeling of food-energy-water resource security in a megacity of China: Insights from the case of Beijing**. Journal of Cleaner Production 355(2022) 131773

Annexes

Annex A. Search keys in the literature review

The main search key was the set of terms: food + system + amazon (amazonia) in English and sistemas/sistema + alimentar/alimentário + amazônia/amazonía in Portuguese/Spanish. Using the team's prior knowledge and discussions with FSF experts, further sets of terms were added to broaden the search for articles, including:

English*: Food system + Amazon, Food system dynamics + Amazon, food system + resilience, food system + Indigenous People, food system + traditional production, food + agroecology, food + bioeconomy.*

Portuguese: *Sistema alimentar + Amazônia, segurança alimentar + Amazônia, sistemas agroalimentares + Amazônia, sistema alimentar + amazônia + comunidade tradicional.*

Spanish: *Sistemas alimentarios amazónicos, Sistemas alimentarios + Amazonía, sistemas alimentarios + Indígenas, sistemas alimentarios + resiliencia.*

Annex B. Comparative analysis in countries

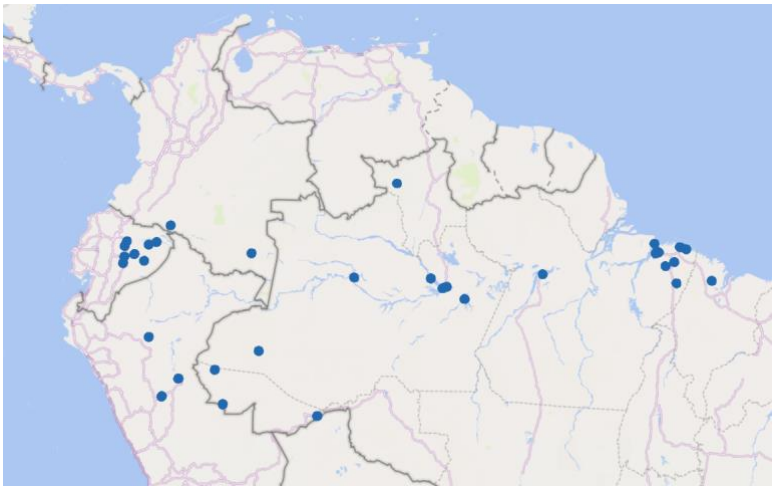
The number of articles on Brazil is much higher than on other Amazonian countries, which is to be expected due to the surface area of the Amazon rainforest in Brazil and the concentration of the population. Brazil food systems articles and concepts address the food, social, productive and governance dimensions, in addition to considering all the main actors involved in the region's food system. The articles also reflect the impact of the country's government programmes related to income guarantees (Bolsa Família), family farming and, in particular, school feeding programmes such as the PNAE (National School Feeding Programme) and the PAA (Food Acquisition Programme). As mentioned in the introduction, Brazil is the only Amazonian country where industrial agriculture is significant in and around the Amazon rainforest. Concepts relating to agricultural productivity and objectives such as deforestation and the dynamics and impacts of the introduction of processed foods are therefore discussed. and derivatives of raw materials to the agri-food system.

In the Spanish-speaking countries, there is a notable proportion of articles on Ecuador, Colombia and Peru, where indigenous food systems. The articles address concepts on the cultural dimension of food systems, such as farmers' perceptions of food. One of the articles specifically addresses the impact of tourism on the food system of indigenous communities.

There are few references to studies in Venezuela and few publications by Venezuelan authors. The same applies to British Guiana, Suriname and French Guiana. For the criteria discussed in the methodology, there is no mention of studies in these regions among the selected articles.
In relation to the common aspects in the literature from the different Amazonian countries or research lines, practically all of them reflect the importance of a more comprehensive evaluation of the problems and their causes.

The figure below presents the locations mentioned in the articles, highlighting that some of the articles conduct regional analyses and others evaluate national programmes and aspects of the food system.

Figure 11. Locations mentioned in the selected articles.



Many articles are the result of alliances between universities and research centres in the Amazon and other regions of the country, as well as international cooperation. The following map shows the home institutions of the authors of the articles

Figure 12. Institutions of origin of the researchers of the articles analysed (the area of the circle represents the number of investigations).

Annex C. Institutions of origin of the authors

1. UBA: University of Buenos Aires. Buenos Aires, Argentina
2. UFCA: Universidade Federal do Acre. Rio Branco, Brazil
3. RBESAS: Rede Bragantina de Economia Solidária Artes e Sabores. Bragança, Brazil
4. EMB_AO: Embrapa Amazônia Oriental. Belém, Brazil
5. GEN: Genesis. Bragança, Brazil
6. ECRAMA: Escola de Formação para Jovens Agricultores de Comunidades Rurais Amazônicas - ECRAMA. Bragança, Brazil
7. UFAM: Universidade Federal do Amazonas. Manaus, Brazil
8. UFPA: Federal University of Pará. Belém, Brazil
9. UFRJ: Federal University of Rio de Janeiro. Rio de Janeiro, Brazil
10. USP: University of São Paulo. São Paulo, Brazil
11. ILMD: Instituto Leônidas e Maria Deane. Manaus, Brazil
12. FIOCRUZ: Fiocruz Amazônia. Manaus, Brazil
13. UEPA: Universidade do Estado do Pará. Belém, Brazil
14. UFRJ: Federal University of Rio de Janeiro. Rio de Janeiro, Brazil
15. UFF: Universidade Federal Fluminense. Niteroi, Brazil
16. INPA: National Institute for Amazonian Research. Manaus, Brazil
17. FUNAI: National Indigenous Foundation. Cruzeiro do Sul, Brazil
18. EMB_RB: Brazilian Agricultural Research Company. Rio Branco, Brazil
19. UNESP_BOT: State University of São Paulo. Botucatu, Brazil
20. UFPEL: Federal University of Pelotas. Pelotas, Brazil
21. UFMA: Federal University of Maranhão. São Luiz, Brazil
22. ENSP: Escola Nacional de Saúde Pública. Rio de Janeiro, Brazil
23. UNB: University of Brasília. Brasília, Brazil
24. ENSP: Escola Nacional de Saúde Pública. Rio de Janeiro, Brazil
25. UFRA: Universidade Federal Rural da Amazônia. Paragominas, Brazil
26. UNIR: Federal University of Rondônia. Porto Velho, Brazil
27. DINNER-USP: Centro de Energia Nuclear na Agricultura / Universidade de São Paulo. Piracicaba, Brazil
28. BROCKU: Brock University. St. St. Catharines, Canada
29. MCGILL: Mcgill University. Montreal, Canada
30. UOGUELPH: University of Guelph. Guelph, Canada
31. CIAT: International Center for Tropical Agriculture. Palmira, Colombia
32. KU: University of Copenhagen. Copenhagen, Denmark
33. UTEQ: Quevedo State Technical University. Quevedo, Ecuador
34. UEA: Amazon State University. Puyo, Ecuador
35. IEP_Lyon: Institut D'Etudes Politiques de Lyon. Lyon, France
36. UNESCO: United Nations Educational, Scientific and Cultural Organization. Paris, France
37. CIRED: Centre International de Recherche sur l'Énvironnement et le Développement. Nogent-sur-Marne, France
38. CIRAD: Centre de coopération internationale en recherche agronomique pour le développement. Montpellier, France
39. UMONTPELLIER: University of Montpellier. Montpellier, France
40. CAYETANO: Peruvian University Cayetano Heredia. San Martín de Porres, Peru
41. UPM: Polytechnic University of Madrid. Madrid, Spain
42. UNIBE: University of Bern. Bern, Switzerland
43. Leeds: University of Leeds. Leeds, UK
44. UL: University of London. London, UK
45. BBSRC: Biotechnology and Biological Sciences Research Council. London, UK
46. JHU: John Hopes University. Baltimore, USA
47. UCLA: University of California. Davis, USA
48. SMU: Southern Methodist University. Dallas, USA
49. DU: University of Denver. Denver, USA
50. IU: Indiana University. Bloomington, USA
51. UNM: University of New Mexico. Albuquerque, USA
52. RUTGERS: The State University of New Jersey. New Brunswick, USA
53. FIELDMUSEUM: Field Museum. Chicago, USA

Annex D. Location of communities mentioned in the literature

#	Name	Latitude	Longitude
1	Santarém	-2,44353	-54,72469
2	Yurimagua	-5,85757	-76,33151
3	Waorani	-1,31963	-77,27411
4	Shuar	-1,81925	-77,88049
5	Kichwai	-1,46466	-77,82551
6	Yasuni	-0,79699	-76,50533
7	Amaña	-2,61826	-65,10982
8	Panaillo	-8,09685	-74,64241
9	Huni Kui	-9,45972	-72,19004
10	Yanomani	2,62403	-62,77434
11	Imbiral	-2,80656	-45,41705
12	Chakra	-0,87463	-77,82611
13	Paragominas	-2,93727	-47,36246
14	Irituia	-1,76757	-47,45509
15	Costa do Caldeirão	-3,21649	-60,25082
16	Paquequer	-3,80176	-59,03938
17	Primavera	-0,93772	-47,12276
18	Cruzeiro do Sul	-7,62635	-72,67214
19	Bragança	-1,05406	-46,76924
20	Concórdia do Pará	-1,99345	-47,94675
21	Salvaterra	-0,75452	-48,51853
22	Kanamari	-6,61321	-70,30486
23	Acrelândia	-10,07517	-67,05473
24	Novo Airão	-2,66971	-60,89525
25	Icoaraci	-1,29847	-48,46761
26	Manaus	-3,12419	-60,01753
27	Santa Bárbara do Pará	-1,22276	-48,29794
28	Yasuni	-0,65614	-76,06594
29	Putumayo	0,26691	-75,32141
30	Aguaytia	-9,03906	-75,52171
31	Amazonas	-1,27437	-70,80387
32	Pastaza	-1,69791	-76,72317
33	Napo	-0,61576	-77,71279

Annex E. Participants of the Exploring Future Scenarios workshop on Amazonian food systems

Workshop held in Belém, Brasil on September 30, 2024.

#	Name	Organisation	Country
1	Adriana Campelo	UNDRR	Brazil
2	Andrea Murcia	World Food Programme	Panama
3	Andrés Martínez Hoyos	SINCHI	Colombia
4	Carlos Durigan	WRI	Brazil
5	Cecilia Martinez Mesías	Federación de comunidades nativas yaneshas (FECONAYA)	Peru
6	Dalva Maria da Mota	EMBRAPA Amazônia Oriental, Belém, PA, Pesquisadora	Brazil
7	Damian Pachon Andrade	World Food Programme	Colombia
8	Donnette Richie	The Ministry of Agriculture	Guyana
9	Efrain Almeida	World Food Programme	Venezuela
10	Eji Misael Campos	Federación Departamental de Frutos Amazónicos de Pando (FEDEFAP)	Bolivia
11	Gabriela Fernanda Bravo	Ministerio de Ambiente, Agua y Transición Ecológica	Ecuador
12	Goetz Schroth	UNDP	Brazil
13	Gregory Munene	World Food Programme	Guyana
14	Herena Maues	Comissão da Alimentação Tradicional dos Povos do Pará (Catrapovos-Pa)	Brazil
15	Jane Moura	Instituto Mapinguari	Brazil
16	Joanna Martins	Manioca/ Assobio	Brazil
17	Juan Reategui Silva	AIDESEP	Peru
18	Julio Andres Rozzo	Amazonia Emprende	Colombia
19	Kelin Sejas Merelis	Organización de Jóvenes Indígenas de la Amazonia de Pando (OJIAP)	Bolivia
20	Ludlow Jones	Institute of Food and Nutrition Security	Guyana
21	Márcia Muchagata	Gabinete, Secretaria Nacional de Segurança Alimentar e Nutricional	Brazil
22	Ma. Fernanda Alvarez	Amazonía Emprende	Colombia
23	Maria Giulia Senesi	World Food Programme	Brazil
24	Nadia Aline Fernandes	Federal University of Para	Brazil
25	Nayla Almeida	World Food Programme	Brazil
26	Nigel Richards	The Ministry of Agriculture	Guyana
27	Niraj Parsadi	Ministry of Agriculture, Animal Husbandry and Fisheries	Suriname
28	Noel Amilcar Chapuez	ACIPAP	Colombia
29	Rafaela Bittencourt	Federação Nacional dos Trabalhadores na Agricultura Familiar (FETRAF)	Brazil
30	Raphael Leao	World Food Programme	Panama
31	Rathna Kewal	OCTA	Brazil
32	Regina Bakhteeva	World Food Programme	Suriname
33	Roger Zabala Zeballos	Gobierno Autonomo Municipal de Cobija	Bolivia
34	Sathyam Noersalim	VIDS (Association of Indigenous Village Chiefs in Suriname)	Suriname
35	Tilsa Ponce	Universidad Nacional Mayor de San Marcos	Peru
36	Valeria Moura	Deveras Sabor	Brazil
37	Wendel Margaret	Para Lab NV	Suriname

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Delta Amacuro, Venezuela.
Delta Amacuro is one of the most vulnerable states for food security in Venezuela.

Page 3-4. © WFP/Matías Delacroix
Delta Amacuro, Venezuela.
Portrait of an indigenous girl, beneficiary of the school meals programme in Ajotejana.

Page 8. © WFP/Daniel Torres
Nariño, Colombia.
Five women part of the community of Juan Domingo, in Nariño, Colombia, joined to create an association to increase the productivity of their crops of aromatic plants and traditional spices, they are proud to preserve the ancestral food knowledge of the Afro-descendant.

Page 9. © WFP/Semira Comunicaciones
San Martin, Peru.
Hands spreading seed at field. Amazonas and San Martín regions have a high exposure and occurrence natural hazards, this condition highlighted the urgency of promoting and strengthening preparedness actions for response and early recovery through an integrated approach.

Page 13. © WFP/Semira Comunicaciones
San Martin, Peru.
A girl at lunch time, part of an integrated approach that combines humanitarian with social protection actions to reduce the impact of disasters on families and their livelihoods.

Page 20. © WFP/Gustavo Vera
Amazonas, Venezuela.
WFP supports women in rural and coastal areas to recover their livelihoods. Bringing food to their families' tables is a challenge for them.

Page 21. © WFP/Daniel Torres
Putumayo, Colombia.
Together, the Awá and their partners in progress sow the seeds for a greener tomorrow. Their actions echo a profound respect for nature and an unwavering commitment to foster a legacy of balance and harmony with the natural world.

Page 24. © WFP/Lorena Peña
Amazonia, Colombia.
In response to the COVID-19 crisis, WFP is reaching indigenous communities in the remote areas of the Colombian Amazonia, ensuring critically needed food and nutrition security during the pandemic.

Page 28. © WFP/Gustavo Vera
Amazonas, Venezuela.
WFP supports women in Puerto Ayacucho to recover their livelihoods and regain their role and recognition in their communities.

Page 34. © WFP/Matías Delacroix
Delta Amacuro, Venezuela.
Along the Orinoco River, thousands of people live isolated from markets, without access to basic services and transportation. The quality of their diet is extremely poor.

Page 36. © WFP/Matías Delacroix
Delta Amacuro, Venezuela.
Yubisai Tocori, indigenous woman, holding her grandchild in Ajotejana. WFP distributes food to more than 30,000 people in 100 schools along the river.

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