Agroecological transition in the Peruvian Amazon: a promise or a reality?

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A case study based on the Regional BioTrade with Agroecology Focus Strategy in Ucayali, Peru

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November 2024

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Introduction

Peru is one of the world's top 10 megadiverse countries, and the Peruvian Amazon stands out globally for its remarkable biodiversity, rich cultural heritage, and ancestral knowledge (UNEP, 2012). One of the most important activities in the Peruvian Amazon is agriculture, which represents the only primary activity that has registered a positive real growth rate in the last decade in the area. In 2023, agricultural exports exceeded US$10 billion (MIDAGRI,2024), with nearly 900,000 farmers (INEI, 2013) dedicated primarily to cultivating cocoa, coffee, and palm oil. Additionally, these farmers play a crucial role in the conservation of a wide array of native biodiversity such as aguaje (*Mauritia flexuosa*), camu camu (*Myrciaria dubia*), cat's claw (*Uncaria tomentosa*), among others, and their derived products for food and health, thus contributing to the region's economic and environmental sustainability.

However, despite its vast biocultural heritage and unexplored economic potential, the Peruvian Amazon faces significant challenges, including widespread deforestation, biodiversity loss, persistent poverty, low productivity in agriculture, and restricted access to both national and international markets. These challenges affect the agriculture sector but can also be consequences of agricultural activities. In response, BioTrade and agroecology offer viable approaches and business models for sustainable agricultural development on the Amazon, emphasizing the production and commercialization of agricultural products and ingredients based on environmental, social, and economic sustainability criteria.

> "This paper outlines the roadmap and methodology for the co-creation of the Regional BioTrade Strategy with an agroecological focus

To create the enabling conditions for a transition toward sustainability, the Regional Government of Ucayali, the second-largest region in Peru, has approved a groundbreaking BioTrade Strategy with an agroecological focus, and an Action Plan 2023-2028 (Regional Resolution N° 019-2023-GRU-CR). Spearheaded by the NGO Terra Nuova and the CGIAR Initiative on Agroecology, this policy aims to strengthen institutional frameworks, legal structures, and mechanisms to promote, finance and implement BioTrade through the lens of agroecology in the Amazon region of Ucayali. With its rich natural resources, the region showcases a diverse and underutilized range of native products with untapped potential to generate economic benefits for farmers and SMEs, while protecting the biodiversity essential for local food systems and livelihoods. Having the first strategy of its kind in Peru and Latin America, Ucayali is positioned to become a leader and model for other biodiversity and culturally rich regions in transitioning to sustainable agriculture.

This paper outlines the roadmap and methodology for the co-creation of the Regional BioTrade Strategy with an agroecological focus. It details the process, key challenges, and opportunities encountered, shares valuable lessons learned, and suggests future directions. Additionally, it provides a framework for scaling up and replicating the strategy in other regions of Peru and Amazonian contexts across Latin America. What we present here may serve as a valuable reference for policymakers and government authorities in terms of developing incentives for sustainable agriculture models that address food security, climate change, and the utilization of biodiversity while safeguarding it for the future. Ultimately, we aim to leverage the conservation of the Amazon's invaluable natural resources through a novel model that integrates the application of BioTrade and agroecological principles while bringing together public and private stakeholders at the most relevant and effective regional or territorial levels.

Agroecology refers to...

...A holistic approach that emerged to address the environmental and social impacts of industrial agriculture through the design of production systems that do not deteriorate natural resources (e.g., water, soil, biodiversity) while generating social and economic well-being". (Altieri and Nicholls, 2017; Méndez, 2010)

Agroecology is based on concepts from agronomy and ecology, tracing its scientific roots back to the 1930s. Since the late 1970s, it has incorporated elements of traditional farming systems into its body of knowledge and developed, par excellence, in Latin America. Agroecology has evolved from a technical, field-focused scientific discipline and set of practices to address the environmental, social, economic, cultural, and political aspects of the food system. Today, it is considered a science, practice and social movement (Gliessman, 2018; Silici, 2014; Wezel et. al., 2009).

Agroecology in Peru dates to the 1980s, with the foundation of the Organic Agriculture Network (RAE) in 1989. In 1998, the National Association of Organic Producers (ANPE) was formed, and, in 2005, the Peruvian Agroecological Consortium (CAP) brought together farmers' organizations, consumers, researchers, NGOs, and national institutional networks to promote agroecological food systems. With the approval of the Technical Regulation of Organic Producers in 2006, national and regional-level commissions for organic production were created: the National Council of Organic Products (CONAPO) and, for each region, including Ucayali, a Regional Committee on Organic Production (COREPO) (Alvarado et al., 2015).

BioTrade refers to...

"...Activities involving the collection, production, transformation, and marketing of goods and services derived from biodiversity – encompassing genetic resources, species, and ecosystems – under environmental, social, and economic sustainability criteria" (UNCTAD, 2020). These criteria, known as the BioTrade Principles and Criteria (P&C), have been the foundational framework guiding the implementation of the UNCTAD BioTrade Initiative, BioTrade programs, and related activities since 2007.

The BioTrade P&C are versatile and have been applied in various contexts. They serve as benchmarks for assessing the social, economic, and environmental impacts of projects, shaping policy guidelines, and evaluating the supply chains of financial or investment initiatives. As such, the BioTrade P&Cs provide broad guidelines that can be tailored to specific applications. They can be applied at both the institutional level (e.g., national or regional programs) and at the level of supply chain actors (e.g., companies or producer associations) (UNCTAD, 2020).

In Peru, the National Program for the Promotion of BioTrade was established in 2004. The National BioTrade Strategy was formulated in 2006, and in 2010, the National Commission for the Promotion of BioTrade was created, comprising both public and private institutions. In 2015, the National BioTrade Strategy and its Action Plan to 2025 were published, aiming to consolidate the necessary institutions, legal framework, and mechanisms to promote and implement the BioTrade approach in Peru. Through BioTrade, numerous products derived from Peru's rich biodiversity have been successfully positioned in local and international markets, leading to the revaluation of native resources and raising global awareness of Peru's natural wealth.

I. Why BioTrade and Agroecology?

Peru is home to 13 percent of the Amazon rainforest, encompassing over 70 million hectares (MINAM, 2016). The Peruvian Amazon is a biodiversity hotspot, harboring approximately 10 percent of the world's known species of birds, mammals, amphibians, reptiles, and vascular plants (MINAM, 2019). This vast region holds significant potential for both timber and non-timber products, including nuts, fruits, fungi, and medicinal herbs. For example, the aguaje fruit is a vital source of income for numerous communities, including indigenous groups in the Ucayali region near the Brazilian border. Additionally, the Amazonian food basket boasts a diverse array of vegetables and fruits rich in proteins and vitamins, many of which have valuable medicinal properties. Notable examples include camu-camu, cat's claw, cocona, and dragon's blood.

However, this forest is shrinking. A report (AC, 2022) by Monitoring of the Andean Amazon Project (MAAP) revealed that the Peruvian Amazon rainforest lost 144,000 hectares of primary, old-growth forest in 2022, marking a 6.7% increase compared to 2021. This rate of deforestation was the fifth highest on record. The central and southern Amazon regions, particularly Ucayali, were the most affected. MAAP also estimates that deforestation led to a loss of over 100 million CO_2 t^2 between 2013 and 2020. The primary drivers of this forest loss include illegal logging, illegal gold mining, and land use changes for agriculture (LULUCF). Notably, small-scale farmers, cultivating areas ranging from 1 to 5 hectares, are responsible for about 30% of deforestation, with the majority linked to subsistence agriculture.

In this context, Ucayali adopted the BioTrade approach to protect and value its native biological diversity, and, at the same time, reduce poverty and contribute to food security. However, given the specific characteristics of Ucayali's agrifood sector – where products are primarily destined for local, regional, and national markets – its value chains, though unique, remain largely unknown to clients and final consumers. On the other hand, its low labor and land productivity levels warrant agroecology as a complementary approach to harness its potential.

Agroecology emphasizes the participation of small producers, viewing them not merely as suppliers but as integral actors in the food system. It fosters connections between producers and consumers, integrates culture and identity into food systems, and enhances natural resource governance. Furthermore, when BioTrade is implemented with an agroecological approach, the focus shifts to empowering producers, giving them a stronger voice and leadership role, underscoring their active involvement in shaping sustainable practices. Both approaches served as a base for the formulation of the Regional Strategy for the Promotion of BioTrade with an Agroecological Focus in Ucayali and its Action Plan for 2028.

Table 1. Dimensions, foci, and principles of the Regional BioTrade Strategy

Dimension	Focus	Principles	
		BioTrade	Agroecology
Environmental	Ecosystemic	Biodiversity conservation	Biodiversity
		Sustainable use of biodiversity	Soil health
			Animal health
	Adaptive management		Synergies
Socio- environmental	Adaptive management	Respect for the rights of actors involved in BioTrade activities	Co-creation of knowledge
			Social values and diets
Social	Sustainable livelihoods	Fair and equitable distribution of benefits arising from the use of biodiversity	Justice
		Clarity on the right to use and access natural resources	Participation
		Compliance with national and international legislation	Land and natural resource governance
Socio-economic	Value chain	Socioeconomic sustainability	Connectivity
			Economic diversification
Economic	Circular economy	Sustainable use of biodiversity	Input reduction
			Recycling

Source: *Adapted from the Regional Strategy for the Promotion of BioTrade with an Agroecological Approach (GRU, 2023)*

Table 2. Compatibility and completability of BioTrade and Agroecology Principles

7 BioTrade principles	13 Agroecology principles
Biodiversity conservation (1): Conserving, restoring, and enhancing the richness of species, ecosystems, and genetic diversity.	**Biodiversity (5):** Preserve and enhance species diversity, functional diversity and genetic resources.
Sustainable use of biodiversity (2): Adaptive management practices and measures to prevent or mitigate negative environmental impacts.	**Soil health (3):** Caring for the health and functioning of soils.
Fair and equitable benefit-sharing (3): Access and benefit-sharing within the framework of utilization of genetic resources, requiring prior informed consent and mutually agreed terms between the parties.	**Synergy (6):** Ecological interaction between agroecosystem elements.
Socioeconomic sustainability (4): Sustainably managed products can position themselves in specific markets and remain there for a long time.	**Recycling (1):** Using local renewable resources and closing nutrient and biomass resource cycles.
Compliance with the law (5): Compliance with all relevant legislation and regulations is fundamental to the legitimacy of organizations and access of their products to international markets, internationally, nationally and regionally.	**Input reduction (2):** Reduce or eliminate dependence on purchased inputs and increase self-sufficiency.
Respect for authors' rights (6): Respecting the rights of the actors behind the generation of local development is fundamental in the management of a BioTrade organization.	**Animal health (4):** Ensure animal health and welfare.
Right of use and access to natural resources (7): Having clarity about their rights is fundamental for the responsible management of an organization. Only then will the organization be able to make the necessary long-term investments and implement management measures to ensure sustainability.	**Fairness (10):** Support small-scale producers who promote fair trade and equitable employment.
	Land and natural resource governance (12): Strengthen institutional arrangements with the objective of recognizing and supporting family farmers, small-scale producers and peasant food producers.
	Participation (13): Encourage social organization and participation of producers and consumers to ensure that the management of agricultural and food systems is adapted to each locality.
	Economic diversification (7): For greater financial independence and value-adding possibilities.
	Social values and diets (9): To build food systems based on the culture, identity, tradition, and social and gender equity of local communities that provide healthy diets.

Source: *Matos, 2024*

II. Roadmap and methodology of the Strategy co-creation process

In 2023, the Regional Government of Ucayali approved the Regional Strategy for the Promotion of BioTrade with an Agroecological Focus and its Action Plan to 2028 aligned with the National BioTrade Strategy. This initiative, formalized through Regional Ordinance No. 019-2023-GRU-CR, opens the way for designing interventions that intentionally promote the sustainable use of native biodiversity-based products and ingredients, harness ecosystem services, and include social dimensions. The strategy prioritizes 10 local native value chains based on their economic profitability, demand, and the quantity and quality of supply (see Table 2). It also integrates industries such as ecotourism, local gastronomy, and the agrifood sector, incorporating agroecological practices in the production phase and circular economy principles in the transformation process following the BioTrade business model.

Aguaje (Mauritia flexuosa)

Contains omega 3, 6 and 9 fatty acids, high in vitamin A. Rich in carotenes, which play an important role in the prevention of degenerative diseases. High in polyphenols.

Camu Camu (Myrciaria dubia)

Existing fruit with the highest vitamin C content; helps strengthen the immune system; rich in potassium.

Aji charapita or Lost Incan Pepper (Capsicum chinense)

It contains a high level of capsaicin, an anticoagulant that is ideal for people at risk of cardiovascular disease, and it protects the stomach from the batteries that cause disease.

Cocona (Solanum sessiliflorum)

High in insulin to stabilise blood sugar levels, blood pressure and cholesterol; contains B complex to aid metabolism and a source of fibre and iron to prevent anaemia.

Asai (Euterpe precautoria)

Rich in polyphenols and antioxidants, calcium and phosphorus; helps control the immune system and fight cell degeneration

Copaiba (Copaifera officinalis)

Helps strengthen the immune, digestive, cardiovascular, nervous and respiratory systems; cell regenerator; soothes joint pain.

Cat's claw claw (Uncaria tomentosa)

It has anti-inflammatory properties. Helps to treat infections, rheumatism and arthritis. Strengthens the immune system.

Dragon's blood (Croton lechleri).

It contains an alkaloid called taspine, which has anti-inflammatory and antibacterial properties and speeds up the healing of wounds and lacerations. It helps in the treatment of acne, gastritis, ulcers and diarrhoea; cell regenerator.

Bijau (Calathea Lutea)

It serves as a wrapper to give flavour, aroma and protection to the food of the Amazonian populations by tradition.

Paiche (Arapaima)

The meat is of high quality; rich in omega 3, 6 and 9; high in iron and zinc to combat anaemia;

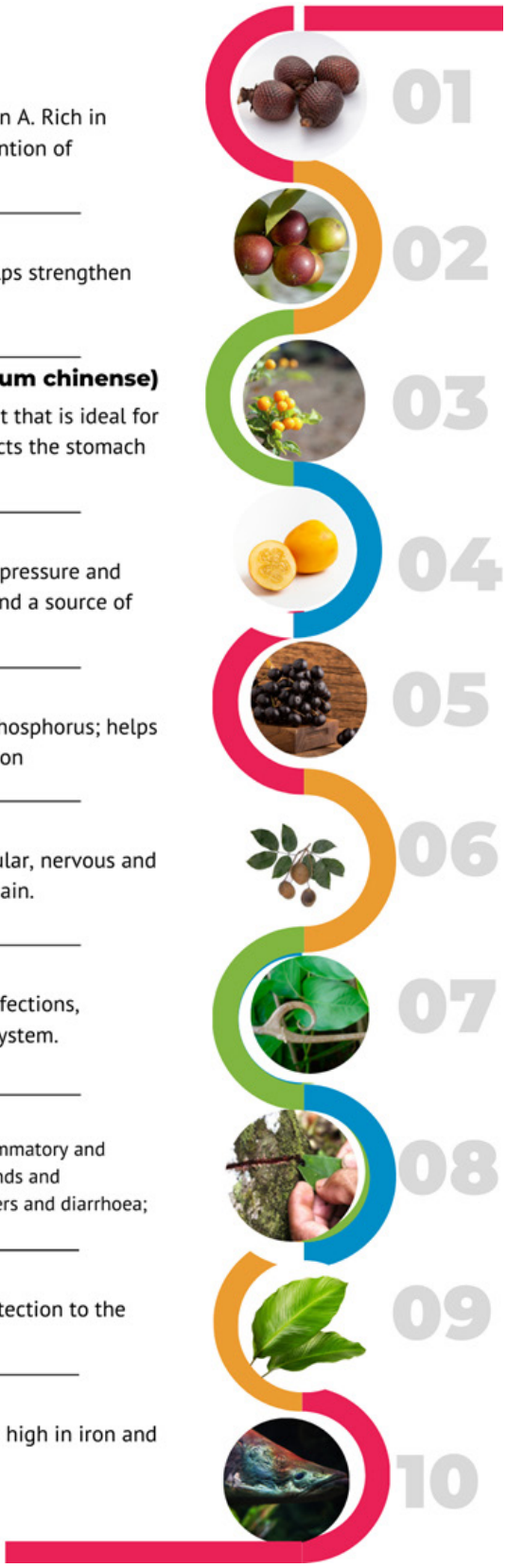

Figure 1. List of prioritized biodiversity in Regional Strategy for the Promotion of BioTrade with an Agroecological Focus and its Action Plan to 2028.

Source: authors

The process of developing the Strategy was participatory, involving more than 50 actors from various institutions and sectors such as academia (National University of Ucayali, National Intercultural University of the Amazon, and others), research institutions (National Research Institute -INIA, Research Institute of the Peruvian Amazon -IIAP, Veterinary Institute for Tropical and High Altitude Research -IVITA, and others), government entities (National Water Authority -ANA, Regional Forestry and Wildlife Office –GRFFS, Regional Agriculture Directorate -DRAU, Regional office for promotion of trade and tourism -DINCETUR, Peru's National Service of Natural Areas Protected by the State -SERNANP, National Agrarian Health Service -SENASA, and others), and local biodiversity-based SMEs.

The process was overseen by the Regional Technical Commission, created in 2021 and consisting of seven members (Regional Executive Resolution N° 610-2021-GRU-GR). Tasked with both developing the Strategy and implementing the activities outlined in the Action Plan, the Commission's responsibilities were extensive - it was charged with aligning the Strategy with management tools to enhance governance, build capacities, promote initiatives, strengthen technical and scientific support, and mobilize resources through various financing mechanisms. The Commission operated under the leadership of the Regional General Manager and the Office of Economic and Social Development of the Regional Government of Ucayali.

The structure of the Regional Strategy is aligned with the National BioTrade Strategy and its Action Plan for 2025, incorporating its seven (7) thematic axes – policy and normative framework, institutions, supply development, R&D+I, market access, knowledge transference and M&E. These axes were evaluated based on the principles and criteria of BioTrade, Agroecology, and the Circular Economy, with a focus on product prioritization. From this evaluation, twelve (12) strategic objectives were formulated, leading to the development of an action plan designed to address the identified challenges. This action plan seeks alignment with key management instruments, including the Concerted Regional Development Plan, the Low-Emission Regional Rural Development Policy, the Regional Competitiveness Plan, the Regional Biological Diversity Strategy, and the Ucayali Regional Climate Change Strategy. Additionally, it aims to establish mechanisms to create the enabling conditions necessary for positioning BioTrade and Agroecology as sustainable business models.

Spanning eight months, this collaborative effort included 8 workshops to validate data, gather information, and develop an Action Plan. Monthly meetings of the Regional Commissions were also held to evaluate progress and ensure the report's development stayed on track (see Figure 2).

In accordance with the methodology established by the National Center for Strategic Planning (CEPLAN), relevant information has been integrated on the current realities, desired future, and multidimensional factors influencing regional competitiveness – such as human capital, sustainability, communication, institutions, and labor and financial conditions. This is complemented by prospective studies on food and nutritional security and market trends up to 2050. Together, these elements shape the BioTrade strategy in Ucayali, which adopts an agroecological approach and underscores the need for high-level specialization in strategic planning. It also highlights the understanding of the opportunities and challenges involved in managing and scaling bio- and eco-businesses in the Peruvian Amazon.

The strategy and its action plan offer a new perspective on development, emphasizing a business-driven approach to biodiversity. This approach acknowledges the responsibility that production and consumption processes hold in relation to biodiversity. Consequently, the region is moving toward resilient yet proactive planning in terms of regulations, incentives, and the prioritization of transparent, traceable, inclusive, and equitable policies. These policies are aimed at addressing the gaps in connectivity, food security, health, and education for people of the Amazon basin.

The methodology represents a participatory, transparent and concerted approach between the strategic representatives of the Technical Commission (public, private and academic), who propose and formulate the strategy, and the Regional Council of the Regional Government, which approves it for dissemination by the Regional Governor as part of his development priority that complements the regional competitiveness strategy.

Vision of the Regional BioTrade Strategy under the Agroecology approach:

"By 2028, BioTrade in Ucayali will have been developed with an agroecological focus, serving as a sustainable model and applying circular economy practices for goods and services derived from native biodiversity that are recognized in the national market."

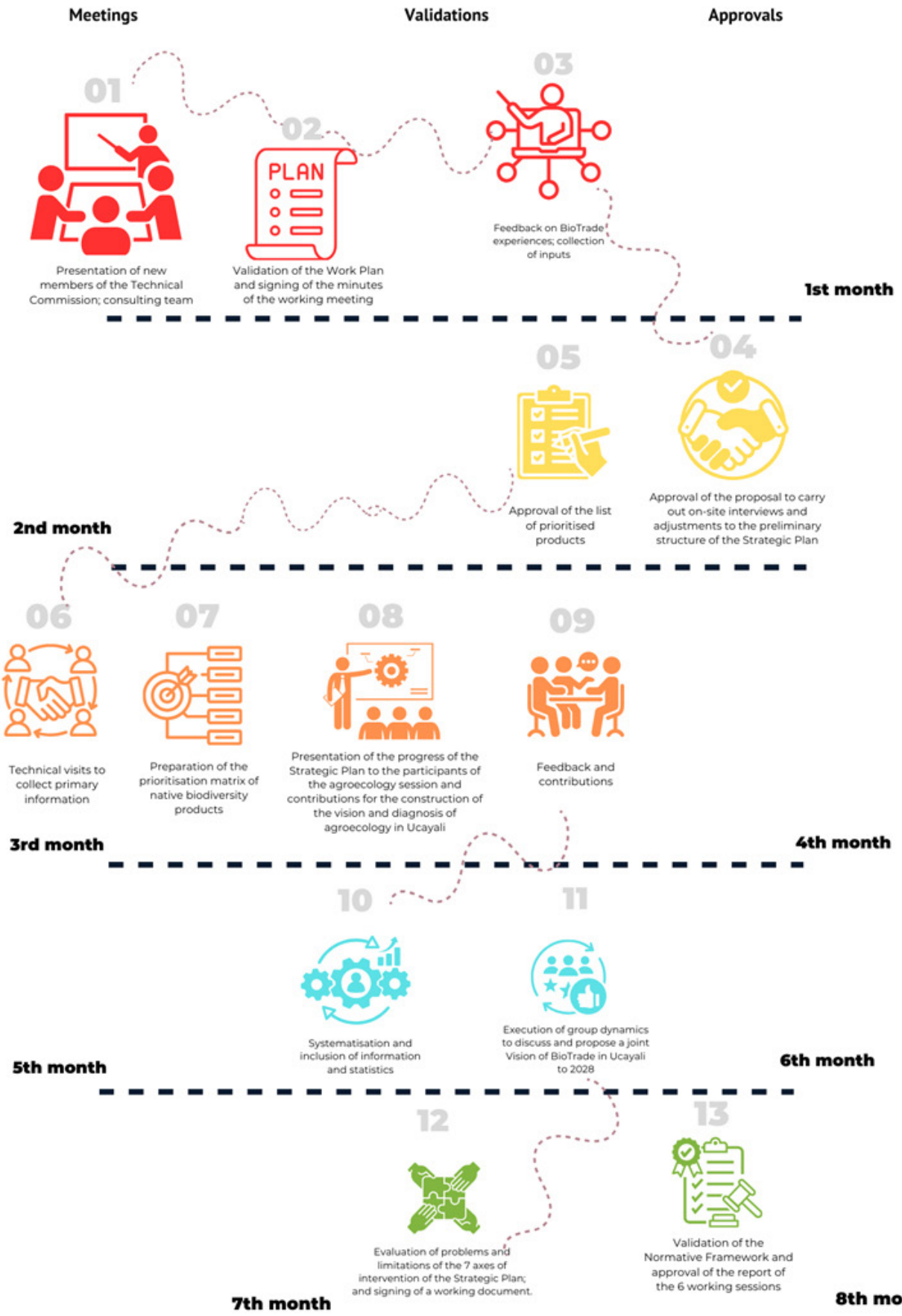

Figure 2. Road Map - participatory, transparent and concerted approach
Source: authors

III. Lessons learned and ways forward

Ucayali's BioTrade Strategy with an Agroecological Focus promotes the sustainable use of biodiversity goods and services, social inclusion, and innovation for a circular economy and sustainable food systems in the Peruvian Amazon. This policy aligns with the regional government's efforts to combat poverty, climate change, and deforestation. The Strategy specifically emphasizes the need to strengthen governance that fosters resilience to climate change, incorporating gender and intercultural approaches. The goals and indicators of the Action Plan 2028 aim to institutionalize and develop mechanisms to promote bio-businesses based on the agroecological principles. Their formulation and roadmap to implementation required a multisectoral and multistakeholder effort unlike any other in the region.

Finding synergy between the BioTrade and agroecology approaches, as outlined in the Regional Strategy, entailed a comprehensive analysis of the territory and economic activities related to the collection, production, transformation, and commercialization of the 10 prioritized native resources. The integration of these approaches not only aimed to strengthen the conservation and utilization potential of Ucayali's unique portfolio of biodiversity products and ingredients for national and international markets, but also emphasized the need to develop short distribution channels to attend to local and regional markets. Short distribution channels for these native products are a response to growing consumer awareness and demand for healthy and added-value products that have been part of their local food cultures and identities, but largely neglected or underutilized. In terms of social proximity, today's consumers increasingly seek direct contact with producers, fostering relationships built on trust.

Despite organizational and administrative challenges such as insufficient funding for field research for the scoping study and high turnover of government officials, a strict timeline limiting the competition of the formulation process to 8 months, and lack of government budget for the implementation of the activities in the Action Plan, the Strategy was approved, and it represents a major milestone in public governance and political will at a regional level.

Specific recommendations include:

- **Capacity-building:** Despite various short-term training, seminars, and workshops, the current state of knowledge and technical capacity to implement the Strategy and Action Plan of regional government officials participating in the Commission is limited, and this represents a key challenge to the long-term development of BioTrade, agroecology and circular economy in the region.
- **Applied research in agroecology:** Most experiences and research in agroecology in Peru have been developed in coastal and Andean contexts, and the Amazon poses specific challenges in terms of pests, diseases, degraded soils, and stress from prolonged droughts in the face of climatic changes. It is highly advised that public and private institutions in Ucayali work collaboratively with farmers and their associations to test agroecological practices adapted to the environmental and socio-cultural conditions of the region.
- **Financial resources:** It is recommended that efforts focus on scaling and projecting key milestones, while maintaining continuous coordination between the Commission and various public-private organizations involved in financing improvements in public policy and governance. Internships would be highly beneficial for specialized technicians, providing them with a global and forward-thinking perspective to modernize financial requirements. This approach can help avoid traditional funding applications that tend to divert resources toward actions that fail to add value to governance, especially in the context of ongoing social, economic, and environmental.
- **Regional vision:** Maintaining a long-term, regional vision of sustainable development in Ucayali, and committing to its fulfillment despite the high turnover rate of government officials, is imperative to convert the Strategy into official policy and to implement its Action Plan to 2028. In fact, there are at least two public policy instruments that support it: (1) the Regional Strategy for Low Emission Rural Development in the Department of Ucayali to 2030 (ERDRBE Ucayali 2030) and its declaration as a regional public policy (O.R No. 009-2021-GRU-CR), and (2) the Concerted Regional Development Plan of the department of Ucayali to 2030 (O.R No. 009-2019-GRU-CR)
- **Institutional strengthening:** The ability of the regional government and other sector-related regional public institutions to perform effectively is key to implement planned activities until and responding appropriately to the challenging demands of global and domestic market conditions and private sector necessities. Financial and technological resources need to be mobilized.

The future of the Peruvian Amazon, the human populations that rely on it, and the food system as a whole demands that all stakeholders in the agrifood sector, both public and private, commit to transcend the status quo – a vicious cycle of natural resource degradation and limited human development - and work towards a common goal: to protect and value the biocultural heritage and natural resources of the Amazon rainforest while facilitating the development of a new sustainable agriculture model. Other Amazonian contexts in South America could adopt the BioTrade, agroecology, and circular economy approaches of the Strategy's vision and reap future benefits in terms of improved human well-being and social equity, while significantly reducing biodiversity loss and depleted ecosystems services.

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