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Decent work grows green forests

A roadmap for a just transition in the Amazon nut value chain through productive jobs and sustainability

October 2025

Overview

- The ILO has been promoting the sustainable development of the Amazon nut value chain in Peru.
- Despite its role in supporting rural livelihoods, conserving biodiversity and contributing to climate change mitigation, the value chain faces persistent challenges, including low productivity among processing enterprises, high informality and precarious working conditions.
- The ILO, in collaboration with CITEproductivo Madre de Dios and the Regional Technical Working Group on the Amazon nut, held consultations and dialogue with value chain stakeholders to develop a roadmap for 2030. It sets out concrete targets to guide joint action across public and private value chain actors, with a focus on strengthening coordination, increasing value addition, and advancing decent work anchored in a just transition approach.
- This brief outlines the ILO initiative's key developments, components and strategic direction.

Introduction

The Amazon region holds extraordinary biodiversity, plays a critical role in mitigating global climate change by acting as one of the world's largest carbon sinks, and sustains livelihoods and traditions of local communities that depend directly on forest resources. Promoting value chains that protect rather than deplete these resources is essential for both environmental protection and sustainable development. The Amazon nut (Bertholletia excelsa)[1] is a prime example of such a value chain. It generates income for rural communities while keeping forests intact, offering environmental, social, and economic benefits.

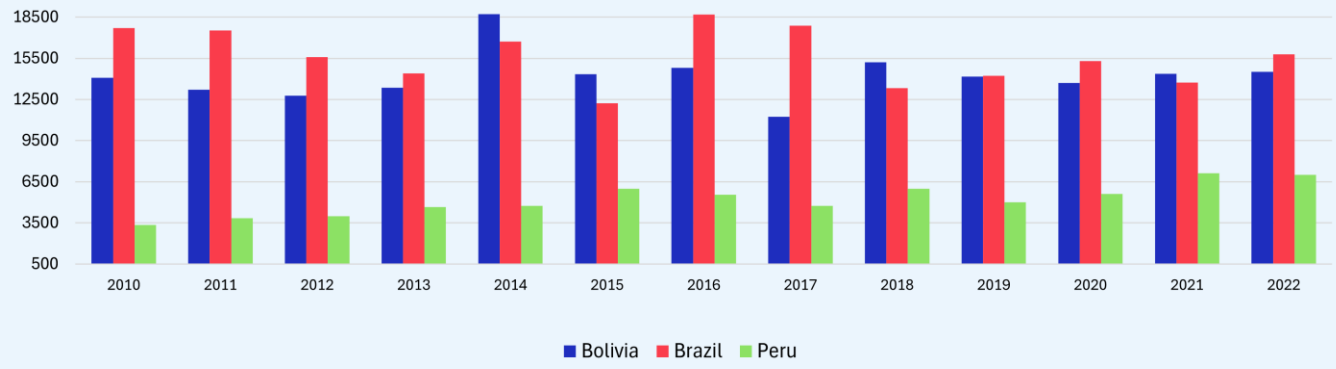
Brazil, Bolivia and Peru account for nearly all global production of Amazon nuts (figure 1). In Brazil, the production is mostly for domestic consumption, while in Bolivia the focus is on export[2]. In Peru, nut harvesting

[1] Also known as Brazil nut, Pará nut, Amazon chestnut, Bolivian nut, and mountain chestnut.

[2] See: Wadt, Kainer, Staudhammer, & Serrano, 2023

is primarily export-oriented and is almost entirely concentrated in the Madre de Dios region (annexure 1). Here, the value chain provides employment to an estimated 15,000-20,000 people, accounting for about 20 per cent of the region's economically active population[3]. In addition to raw nut collection, the value chain supports a growing number of micro, small, and medium-sized enterprises (MSMEs) that add value by processing the nuts into products such as oil, flours, cosmetics or handicrafts. These are later sold in domestic and international markets.

▶ Figure 1: Amazon nut production in Bolivia, Brazil and Peru, 2010-22 (in metric tons)



Source: FAOSTAT (2023)

Despite this, Peru's Amazon nut value chain faces significant challenges. Climate change is disrupting harvest cycles and affecting yields and prices. Most collectors work informally and earn low and unstable incomes, which increase pressure to turn to environmentally harmful activities such as illegal logging and mining. Processors play a key role in generating employment and innovation, but face barriers to accessing both domestic and international markets. They compete with neighbouring countries and regions with better infrastructure, larger markets or greater areas of nut-producing forest, while struggling with limited access to modern technologies and often operating without consistent quality standards, which further limits their export potential.

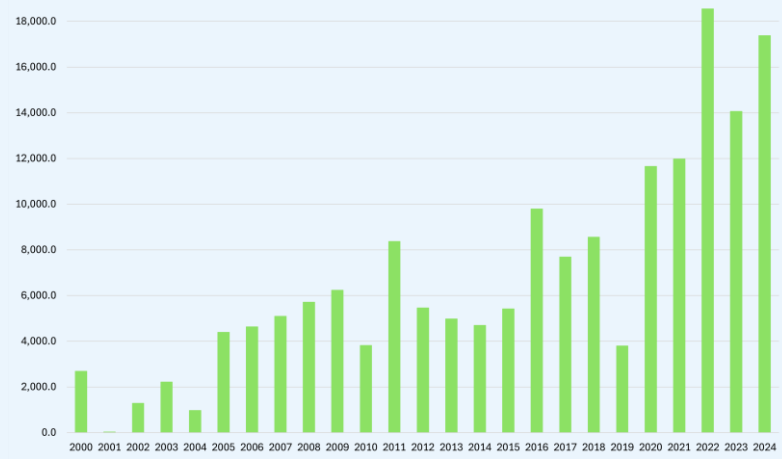
Furthermore, the value chain is undergoing two interconnected transitions. First, changing climate patterns are forcing a shift in harvesting practices and challenging the long-standing economic and social model that supports many local communities. This requires actors along the value chain to adapt. Second, given its potential to support forest conservation and climate change mitigation, the value chain is positioned to play

[3] See: Ministerio del Ambiente del Perú, 2014

a key role in the broader transition towards more sustainable and inclusive economic opportunities in the Amazon.

The ILO is working with stakeholders, primarily in Peru and recently in Bolivia, to ensure that the ongoing transitions are just, prioritizing decent work, productive employment, and environmental sustainability. Particular emphasis is placed on addressing decent work deficits by promoting the participation of women and youth in the value chain, helping to improve both the sector's inclusiveness and its long-term viability. Through multi-stakeholder engagement and dialogue, the ILO in Peru has supported the development of a roadmap aimed at helping enterprises in Madre de Dios diversify nut-based products and improve access to international markets. This brief presents the main findings, challenges, and opportunities identified through the ILO's work, and seeks to contribute to the global discussion on just transition in natural resource-based sectors. The document also aims to foster dialogue with development partners, cooperation agencies, and other stakeholders to strengthen current efforts and build a shared vision for inclusive, resilient, and environmentally sustainable development in the Amazon.

▶ **Figure 2: Amazon nut production[4] in Peru, 2000-24 (in metric tons)**



Source: SERFOR (2000-24)

▶ Role of the Amazon nut in conservation and climate action

The ecosystem in which the Amazon nut grows is one of the most important carbon reserves in South America. In Peru, the Madre de Dios region spans 8.52 million hectares, of which 44.5 per cent lies within protected natural areas and 33 per cent consists of land formally titled for forest use. Of these, a significant proportion is dedicated to non-timber forest products such as the Amazon nut, which is harvested in more than one thousand forest concessions covering an area of approximately 728,000 hectares[5]. Unlike the deforestation-

[4] Both the Amazon nut in shell (primary collected product) and the shelled Amazon nut (processed derivative product) are included here, with the aim of reflecting the total volume of products marketed in the value chain.

[5] See: OSINFOR, 2024

linked activities, nut harvesting does not require tree removal, enabling the preservation of mature forests with high carbon storage potential[6]. Regional studies suggest that, if supported by effective conservation mechanisms, well-managed concessions could reduce projected deforestation in the region by up to 43 per cent by 2050[7].

Beyond climate mitigation, the Amazon nut also plays an important ecological role in maintaining forest health and biodiversity. Its reproduction depends on ecological processes such as seed dispersal by agoutis (a forest-dwelling rodent) and pollination by orchid bees, both of which require intact primary forests. Amazon nut groves also support a rich diversity of organisms, including insects, microorganisms and plant species commonly found around areas where nuts are processed.

Despite its many environmental benefits, the Amazon nut value chain faces structural barriers to long-term sustainability. Small forest concession holders, known as *castañeros*, who harvest nuts from wild trees, often bear the high costs of sustainable forest management without being compensated for the environmental services they help maintain. Limited access to climate-related financing, such as payments for preserving forest carbon or biodiversity, makes it difficult for them to compete with more environmentally destructive activities like logging and mining.

▶ Climate change as a growing risk to the value chain

The impacts of climate change are multifaceted in Madre de Dios. Higher temperatures and humidity have led to an increase in pests and fungi, while less predictable rainfall patterns have damaged rural roads and river transport routes[8]. These environmental changes are also taking a clear toll on the Amazon nut value chain, one of the region's most important forest-based economic activities. Since 2021, producers in Madre de Dios have reported a noticeable decline in yields per tree which they attribute to irregular rainfall, extended droughts, and rising temperatures during the flowering season[9]. These trends continued through the 2025 *zafra* (harvest season), affecting both productivity and profitability. Lower yields increase operating costs per kilogram collected, reducing the activity's economic viability for concession holders and independent harvesters.

Shifts in the Amazon nut tree's natural cycles, such as altered flowering and fruiting times, have also complicated harvest planning and market dynamics by reducing overall production and increasing price volatility[10]. Recent trade data illustrates this fragility; although international prices for Peruvian Amazon nuts

[6] See: Viteri, 2020

[7] See: Sandoval & Flores, 2021

[8] See: Scheuch, Helmut, & Elliot Blas, 2023

[9] See: Jansen & Ibarra, 2021

[10] See: Viteri, 2020.

rose by more than 40 per cent over the past year, export volumes declined, reflecting the growing instability of supply[11].

▶ A source of income for local communities

The Amazon nut is one of the main sources of livelihood and identity for rural populations in Madre de Dios. An estimated 20 per cent of the region's economically active population, approximately 20,000 people, depend directly or indirectly on this activity. It generates employment throughout the value chain, from harvesting and transport to shelling, processing, and marketing[12] (figure 4). For households holding a concession, the activity can represent up to 47 per cent of their total forest-based income[13]. This high level of dependence underscores not only the economic relevance of the sector, but also its potential to generate relatively stable employment in a region marked by structural informality.

Source: UNDP Peru

The value chain engages a variety of local actors, including concession holders, collectors (*barriqueros*), shellers (primarily women), aggregators, processors, and exporters, forming a locally embedded production network with distinct roles and relationships. Women's participation, particularly in shelling activities, plays an important role in advancing the economic inclusion of groups traditionally excluded from formal employment in the region.

The value chain also acts as a buffer against more environmentally harmful economic activities such as illegal mining and unsustainable agricultural expansion. One study identified more than 47,000 hectares of overlap between Amazon nut concessions and mining concessions, posing a serious threat to both the environment and local livelihoods[14]. Strengthening the value chain through improved market access, fair pricing, technical support, and financing can help reduce economic incentives that drive forest degradation.

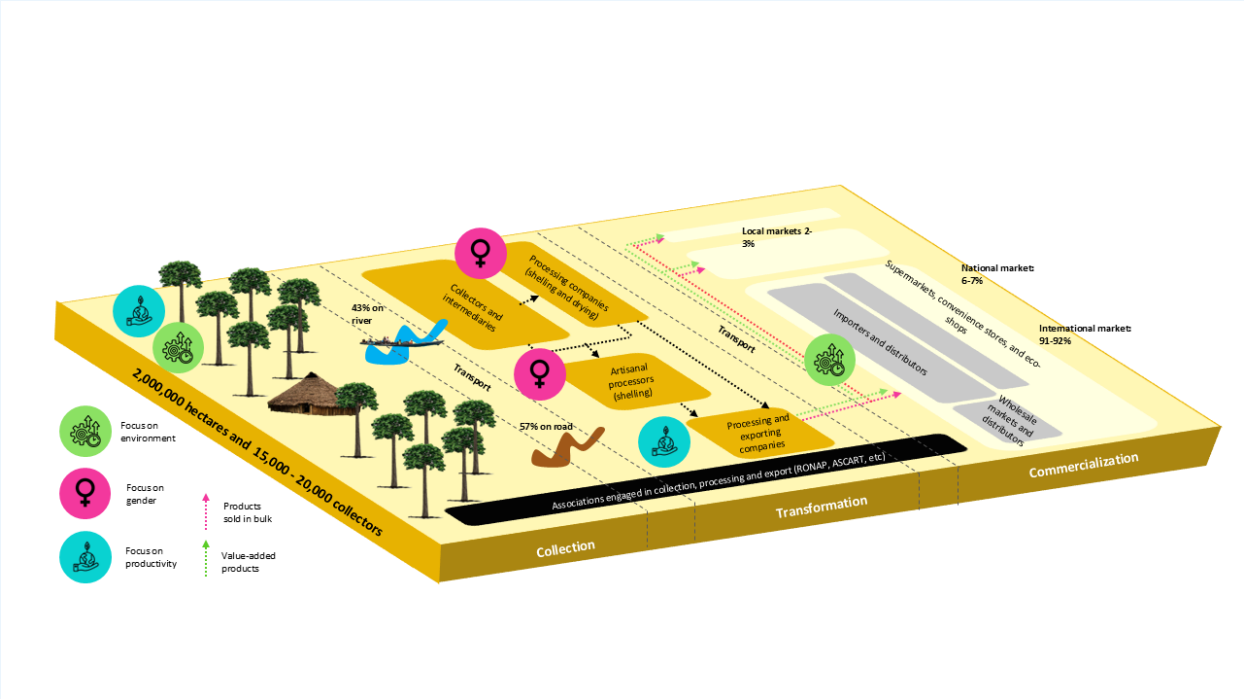
[11] See: PromPerú, 2025

[12] See: Andreu & Günther, 2020

[13] See: Günther & Viteri, 2020

[14] See: Chávez, Llosa, & Vega, 2012

▶ **Figure 3: Overview of the value chain**



Source: SERFOR, MINCETUR (2023)

▶ Value addition and market access through local processing

Amazon nut processors play a strategic role in driving local economic development in Madre de Dios. By transforming raw nuts into value-added products, they create employment opportunities across the value chain, including in collection centres, shelling plants, and logistics. These facilities have also promoted women's inclusion in formal employment, especially in processing stages, contributing to income diversification in communities with limited access to stable jobs.

Capacity building efforts led by institutions such as CITEproductivo Madre de Dios have strengthened technical competencies in processing and quality control. This support has enabled producer associations, harvesters and enterprises to access improved equipment and operational standards. Processors have also emerged as local innovation hubs, piloting new by-products such as flour, snacks, oils and energy briquettes made from shell residues. A notable example is virgin oil branded "*Castaoil*," which was awarded as a gourmet

product at the *Oils of the World* competition in Paris in 2025[15], with support from CITEproductivo Madre de Dios. This recognition highlights the potential of Amazonian value-added products to succeed in competitive global markets and generate new employment niches, particularly for women and youth.

A growing number of MSMEs add value by processing the nuts into oil, flours, cosmetics, and handicrafts. Source: UNDP Peru

Processing Amazon nuts locally adds significant commercial value. Studies from Bolivia and Peru indicate that shelled Amazon nuts can fetch up to three times the price of unshelled nuts in international markets, creating opportunities to increase local income and retain more value within the country[16]. Efforts to improve product quality and market positioning of processing firms in Madre de Dios have been supported by coordination platforms such as the Standardization Committee led by INACAL[17] and PROMPERÚ[18]. These initiatives have helped create pathways to improve infrastructure, traceability and processing capabilities in both artisanal and semi-industrial settings. Leading examples include the company Candela Perú and the Amazon Nut Harvesters Association of the Tambopata Reserve "Los Pioneros" (ASCART), which have adopted standardized production lines meeting export requirements. In February 2025, with support from ACCA, PROMPERÚ, and Aktion Amazonas, they participated in the BioFach fair in Germany to promote Amazon nuts as a sustainable superfood, and strengthen access to organic export markets[19].

The sector has also established stable trade connections with countries such as the United States of America, Germany, the United Kingdom, Canada and South Korea. This success has largely been driven by companies meeting certification requirements and maintaining reliable export logistics. However, the sector continues to face constraints, including fragmented supply, limited access to finance, and difficulties among small producers in complying with international technical standards.

Nonetheless, organizations like the Association of Amazon Nut Harvesters of the Madre de Dios Region (RONAP) and ASCART have demonstrated that with sustained technical support and a focus on quality, it is

[15]The virgin Amazon nut oil "Castaoil," produced by the company *De la Abu su Secreto* with support from CITEproductivo Madre de Dios, was recognized as one of the world's best gourmet oils by the AVPA in Paris. This achievement positions the Amazon nut as a high-value superfood in international markets. https://www.gob.pe/institucion/produce/noticias/1165684-produce-resalta-exito-internacional-de-castaoil-aceite-amazonico-premiado-en-paris

[16] See: Wadt, Kainer, Staudhammer, & Serrano, 2023; Cronkleton & Albornoz, 2009; and Cronkleton, Guariguata, & Albornoz, 2017, pp. 1421–1438.

[17] INACAL (National Quality Institute) is an agency attached to the Ministry of Production of Peru, responsible for promoting and coordinating the development of the National Quality System, including standardization, accreditation, and metrology.

[18] PROMPERÚ (Peruvian Commission for the Promotion of Exports and Tourism) is an agency attached to the Ministry of Foreign Trade and Tourism, whose main function is to promote exports, tourism, and Peru's image abroad.

[19] See: Inforegión, 2025

possible to position Amazon nut products in gourmet and fair-trade segments. Products such as snacks, oils, and powders have begun appearing in specialized catalogues of alternative exporters, providing new income sources for members. Despite these advances, the financial returns remain insufficient to significantly improve the livelihoods of Amazon nut harvesters. For this reason, it is essential to strengthen commercial promotion platforms, increase participation in international trade fairs, and establish long-term buyer linkages. Moreover, a more integrated productive vision is needed – one that places the Amazon nut processing within the broader landscape of concession-based forest management.

▶ Enabling a just transition for MSMEs and communities

Despite the region's renowned biodiversity and rich natural resources, the Amazon nut value chain faces structural barriers that limit its potential to generate decent work and added value at the local level. These challenges were identified through value chain diagnostics and stakeholder consultations and can be grouped into five main categories:

- **Limited productivity and capacities**: This includes low productivity levels in processing enterprises, and limited access to financing, technology and technical assistance.
- **Informality and precarious working conditions**: This includes high levels of informality with limited protection of workers' rights and social protection, as well as gaps in job quality and decent working conditions.
- **Poor infrastructure and connectivity**: This includes significant deficits in physical infrastructure such as roads, energy and telecommunications, and poor digital connectivity, especially in protected areas.
- **Weak governance and coordination**: This includes limited public-private coordination, hindering the creation of enabling environments for investment and employment. Institutional bottlenecks also impede value addition and traceability at the source.
- **Environmental pressures and land use conflicts**: This includes overlap of illegal extractive activities (mining and logging etc.) in Amazon nut harvesting zones, and environmental degradation.

Building on a long-standing partnership for inclusive transformation

Since 2021, the ILO has partnered with the Instituto Tecnológico de la Producción (ITP) and its network of Centros de Innovación Productiva y Transferencia Tecnológica (CITE) to promote inclusive, innovative, and sustainable value chains in Peru. Through this collaboration, a training programme was developed to build capacity in systemic value chain analysis and design of strategies to address challenges related to productivity, employment and sustainability. This led to laying the groundwork for pilot interventions in several regions, one of which focused on the Amazon nut value chain in Madre de Dios.

Building on this foundation, a participatory process was launched in 2024 to develop the **2030 Roadmap for the Amazon Nut Value Chain in Madre de Dios**. The roadmap, developed under the leadership of CITEproductivo Madre de Dios with technical support from the ILO and Regional Technical Working Group on Amazon Nuts, serves as a strategic planning and coordination tool. It identifies critical bottlenecks in the value chain, including gaps in infrastructure, governance, financing, job quality, value addition and inclusion, and proposes 14 integrated goals to address them from an economic, social and environmental perspective. Its content reflects both technical analysis and extensive stakeholder inputs gathered through group discussions, interviews and field visits.

The roadmap represents a shift away from earlier, mainly public sector-focused planning approaches toward a more participatory, incentive-driven model. It places stronger emphasis on engaging private sector actors, particularly lead firms and buyers not merely as stakeholders, but as partners in shaping and driving a just transition. By focusing on what motivates actors across the value chain, from collectors and small processors to exporters and buyers, it seeks to design interventions that align with their interests and embed just transition principles into sourcing practices and contractual relationships, enabling positive impacts to cascade throughout the chain.

The roadmap is structured around a shared vision: To consolidate the Amazon nut value chain as a model of sustainable production and formal employment that protects the forest and improves the livelihoods of women, youth, and local communities. This vision is translated into four strategic objectives that guide the transformation process:

- Strengthen governance and coordination among stakeholders;
- Promote diversification with value addition and innovation;
- Advance decent work and generational inclusion; and
- Ensure conservation and responsible use of forest ecosystems.

To operationalize these objectives, the roadmap sets out 14 measurable targets and five transformative pillars. These pillars provide a coherent framework to align policies, investments and institutional capacities with the principles of circular economy, climate resilience, gender equity, and intergenerational justice.

▶ Inclusive value chain linkages

This pillar promotes sustainable business models that connect small producers and associations with exporting companies, improving quality, access to new markets, and equitable distribution of the value generated.

▶ Productive diversification and innovation

This pillar drives the development of new nut-based products such as oils, flours, snacks, cosmetics and functional foods, alongside complementary services such as ecotourism, environmental education, and carbon credits. These innovations aim to generate new income streams and strengthen the role of Amazonian forests as productive ecosystems.

▶ Inclusion of women and youth

This pillar fosters leadership, technical training, and entrepreneurship among young people and women throughout the value chain, addressing structural inequalities and investing in a new generation of forest stewards.

▶ Strengthening Amazonian identity and pride

This pillar aims to position the Amazon nut as a symbol of Amazonian identity and the cultural heritage of Madre de Dios. It seeks to restore the value of traditional knowledge associated with Amazon nut harvesting, promote territorial pride, and communicate the key role that *castañeros* play as guardians of the forest.

▶ Generational transition

This pillar is geared towards safeguarding the forests, focussing on ensuring generational transition in the nut harvesting activity by involving young people in key roles along the value chain. This involves strategies for technical training, access to land and concessions, intergenerational knowledge transfer, and the inclusion of new perspectives on sustainability, technology, and business models.

The roadmap also prioritizes active forest conservation, promoting the use of clean technologies, environmental certifications, and climate finance mechanisms. By linking conservation to the creation of economic opportunities, Amazon nut concessions are positioned as key platforms for achieving Peru's climate targets and advancing the global sustainability agenda. Figure 5 below illustrates the roadmap.

Figure 4: Roadmap for the Amazon nut value chain in Madre de Dios

Vision

In 2030, the Amazon nut in Madre de Dios is a model of sustainable production and formal employment that provides development opportunities and protects the environment in Peru. It offers a variety of innovative, competitive, and inclusive products and services, with a presence in both national and international markets; safeguarding forests, strengthening the role of women, and improving the quality of life of people in the region.

Strategic Objectives		Goals
1 Governance and coordination for a sustainable value chain	Strengthen governance and coordination among collectors and their associations, processing SMEs, and government entities, international partners, and other stakeholders in the Amazon nut sector in Madre de Dios; with the aim of improving the reach and impact of information flows, transparency, access to financial services, technical assistance, training, and more, for all actors across the different links of the Amazon nut value chain.	**Goal 1:** Foster cooperation and coordination among Amazon nut communities, associations, companies, government entities, international partners, and other stakeholders to improve project management and its impact on the Amazon nut value chain. **Goal 2:** Facilitate linkages between nut-harvester organizations and anchor companies through sustainable productive partnerships to enhance their development opportunities. **Goal 3:** Promote the creation of a mechanism for transparency and coordination of funded projects within the Amazon nut value chain.
2 Product diversification and innovation for greater competitiveness	Promote the diversification and development of value-added products and services derived from the Amazon nut, along with the adoption of clean technologies in harvesting, processing, and marketing; foster the development of tourism, gastronomy, and other related activities; and enable and promote greater value addition through the implementation of quality standards and sustainability certifications that support stronger positioning in national and international markets.	**Goal 4:** Promote the incubation of enterprises and businesses related to Amazon nut concessions through productive development instruments (technical assistance services, training, project design, etc.) that strengthen their linkages with companies and markets. **Goal 5:** Innovate and standardize good harvesting and manufacturing practices across the value chain to improve the quality and competitiveness of products and services derived from the Amazon nut. **Goal 6:** Expand the range of products, services, and niche markets derived from Amazon nut concessions for national and international markets, supported by updated and accessible market studies.
3 Formal employment and the inclusion of women and youth	Support the generational transition in the Amazon nut sector by strengthening the inclusion of youth and women across the different links of the value chain, through efforts that facilitate their access to training as well as opportunities for growth and leadership in the sector. Promote better working conditions and respect for labor rights for all.	**Goal 7:** Encourage leadership roles within the Amazon nut value chain to be taken up by new generations of women and youth. **Goal 8:** Establish policies and programs that improve working conditions across all organizations in the value chain, contributing to the creation of decent work. **Goal 9:** Promote generational transition and the transfer of Amazon nut knowledge through intercultural educational experiences that integrate emerging technologies such as artificial intelligence, art, and data visualization, repositioning nut-harvesters as forest guardians and key agents in the conservation of Amazonian biodiversity.
4 Conservation and responsible sue of Amazonian ecosystems	Promote the conservation, reforestation, harvesting, processing, and marketing of the Amazon nut under principles of sustainable management, circular economy, environmental certifications, and reduced ecological impact; recognizing it as one of the mechanisms that mitigate climate change through the preservation of Amazonian forests and help strengthen climate resilience in nut-harvesting communities.	**Goal 10:** Protect, conserve, and reforest forest areas used for Amazon nut harvesting in Madre de Dios, ensuring the sustainability of Amazon nut production within and beyond reserves and buffer zones. **Goal 11:** Ensure that at least 50% of Amazon nut concessions obtain certifications in environmental sustainability standards and responsible forest management. **Goal 12:** Reduce the environmental impact of the value chain through the use of renewable energy, technology, and circular economy practices across all links of the Amazon nut value chain. **Goal 13:** Promote mechanisms for detecting and addressing those who cause ecosystem damage in Amazon nut territories. **Goal 14:** Disseminate climate finance mechanisms, including the certification and sale of carbon credits, to incentivize Amazon forest conservation and the sustainability of the Amazon nut value chain.

Pillars for the transformation of the value chain

- Sustainable and productive diversification of Amazon nut concessions
- Inclusive and productive linkages between harvesters and processing SMEs
- Strengthening Amazonian identity and pride
- Generational transition to safeguard forests
- Women's inclusion and empowerment

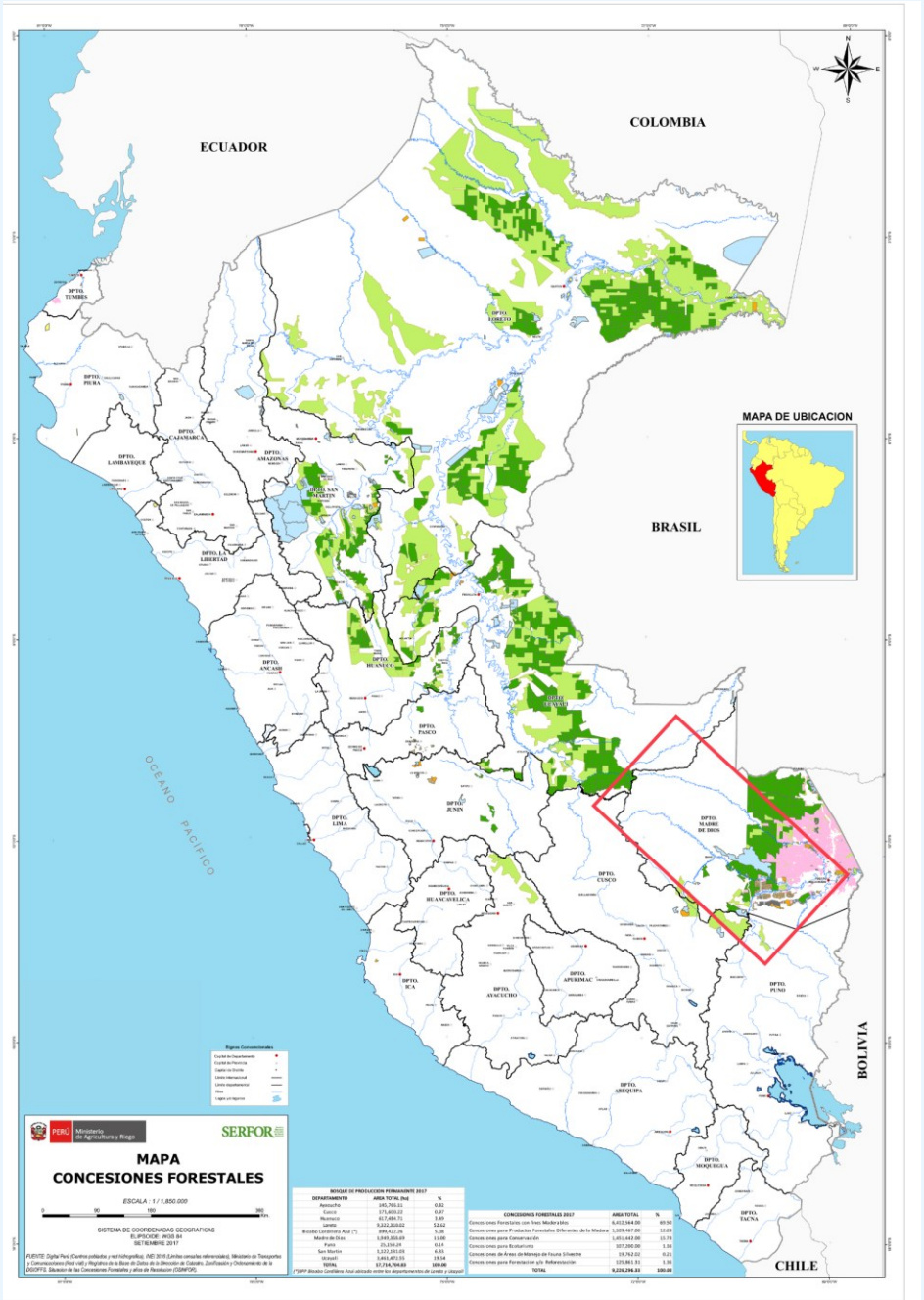
Source: Authors' illustration

The approval of the roadmap marks the beginning of a longer-term process. The next phase will focus on operationalizing its objectives through pilot interventions, resource mobilization and strengthened coordination between value chain actors, particularly with lead firms and public institutions at regional and national levels. Continued technical support and multi-stakeholder engagement will be key to ensuring that implementation remains aligned with the roadmap's strategic vision.

Importantly, the roadmap has already helped catalyse new efforts and investments. With funding from the Inter-American Development Bank (IDB), ITP is now supporting the strengthening of CITEproductivo Madre de Dios in its role as a convener and promoter of the roadmap. This demonstrates growing institutional commitment to the process, and reinforces the potential for coordinated public–private action.

While grounded in the specific context of Madre de Dios, the approach and lessons emerging from this process hold broader relevance. Other forest-based value chains in the Amazon region and beyond face similar challenges around informality, low value capture, and environmental pressures. This experience offers a concrete example of how a participatory and incentive-driven model can guide productive transformation in ecologically sensitive and economically marginalized areas.

▶ Annexure 1: Amazon nut concessions in Madre de Dios



Permanent production forest
Forest concessions for timber purposes
Concessions for non-timber forest products
Concessions for conservation
Concessions for ecotourism
Concessions for wildlife management areas
Concessions for afforestation and/or reforestation

Source: SERFOR (2023)

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