Innovations for adopting agroforestry in Ecuador: the role of the APEOSAE Federation

Agroforestry case study 3. Ecuador

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FFF surveys of knowledge needs in areas of land and natural resources from 41 forest and farm producer organisations (FFPOs) in six countries carried out in 2018 identified two top priority research needs: climate resilience information and options; and diversified climate-smart agroforestry options. By 2022 the FFF programme had assembled case studies and guidance on the first of these priorities, climate resilience, spread in a peer-to-peer learning event in Vietnam (see www.iied.org/20311iied and www.iied.org/21211g). In 2023 further work was commissioned resulting in guidance on how FFPOs can advance agrobiodiversity for climate resilience, with another peer-to-peer learning event in Nepal (see www.iied.org/22251iied and www.iied.org/22451g). Agroforestry systems are the central land use system that allows integration of trees, crops and livestock to advance agrobiodiversity and climate resilience. Now in 2025, the FFF is focusing on the second identified priority knowledge need: how to increase adoption of diversified climate-smart agroforestry. The coproduction process used by FFF draws insights from across the world of the most innovative FFPOs that have encouraged the adoption of agroforestry systems – which are then blended with an academic review of agroforestry adoption – to provide FFPOs with the latest thinking and best practice in promoting agroforestry. This case study is part of that process.

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Cover photo: APEOSAE agroforestry members © CT Suquisupa Herrera

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Abbreviations

APEOSAE	Asociación de Pequeños Exportadores Agropecuarios Orgánicos del Sur de la Amazonía Ecuatorian (Association of Small Organic Agricultural Exporters of the Southern Ecuadorian Amazon)
Anecafé	Asociación Nacional del Café del Ecuador (Ecuadorian National Coffee Association)
CREA project	Camino a la Reactivación del Ecuador Agroalimentario (On the Road to the Reactivation of Agrifood Ecuador)
FFF	Forest and Farm Facility
IIED	International Institute for Environment and Development
ISTAM	Instituto Superior Tecnológico Amazónico (Amazonian Higher Technological Institute)
MAGAP	Ministerio de Agricultura, Ganadería, Acuacultura y Pesca (Ministry of Agriculture, Livestock, Aquaculture and Fisheries)
NGO	Nongovernmental organisation
ProAmazonía	Programa Integral Amazónico de Conservación de Bosques y Producción Sostenible (Comprehensive Amazonian Programme for Forest Conservation and Sustainable Production)

Summary

The APEOSAE Federation (Asociación de Pequeños Exportadores Agropecuarios Orgánicos del Sur de la Amazonía Ecuatorian – the Association of Small Organic Agricultural Exporters of the Southern Ecuadorian Amazon) has implemented a comprehensive strategy to promote the adoption of diversified agroforestry systems among its 130 organic-producer members in the southern Ecuadorian Amazon, specifically in the provinces of Zamora Chinchipe and Morona Santiago.

The APEOSAE strategy combines growing traditional crops such as coffee, cocoa and plantain under the protective shade of native forest species, seeking a harmonious balance between productivity, environmental care and social wellbeing. Through participatory workshops, APEOSAE shares with communities the economic, nutritional, ecological and social benefits of agroforestry, complementing this with technical training that facilitates the management and establishment of demonstration plots, as well as promoting the exchange of ancestral knowledge between Shuar, Saraguro and mestizo producers, strengthening a transfer of knowledge adapted to local realities.

The federation has forged alliances with national and international organisations such as ProAmazonía (Programa Integral Amazónico de Conservación de Bosques y Producción Sostenible – the Comprehensive Amazonian programme for Forest Conservation and Sustainable Production), the CREA project (Camino a la Reactivación del Ecuador Agroalimentario – On the Road to the Reactivation of Agrifood Ecuador), Oxfam Belgium, the United Nations Development Programme (UNDP), Lundin Gold and local governments, which provide technical support, access to organic inputs and promote technological innovation. Under the brand name Sánku, APEOSAE has consolidated the associative marketing of value-added products, successfully positioning organic plantain and cassava snacks in national and international markets, especially in Europe.

At the same time, APEOSAE actively participates in political dialogue and territorial management with local authorities, promoting policies that foster clean production territories and overcome barriers to strengthen sustainable agroforestry. This work has been possible thanks to the commitment and collaboration of leaders, technicians and partners, who have shared their experience and knowledge, with a deep respect for nature and social equity as a fundamental driving force. Together, this collective effort has created an innovative and replicable agroforestry model that promotes sustainable development and climate resilience, and improves the quality of life for Amazonian families, consolidating APEOSAE as a regional benchmark in organic agroforestry production.

1. Introduction to the APEOSAE Federation

1.1 Name and vision of the APOESAE Federation

The APEOSAE Federation (Asociación de Pequeños Exportadores Agropecuarios Orgánicos del Sur de la Amazonía Ecuatorian – the Association of Small Organic Agricultural Exporters of the Southern Ecuadorian Amazon) has a vision that states: “By 2030, APEOSAE will lead a successful model of organic production, associative marketing at the national and international levels, innovation in processing and quality assurance, through the positioning of the Sánku brand and with a legally, administratively and financially strengthened organisation that influences the social, environmental and economic development of the Amazon region and provides economic stability to its members” (APEOSAE Federation 2025).

Its institutional mission states, “We are a society of small Amazonian producers who promote organic and sustainable agricultural practices with a value chain approach, fair associative marketing and the processing of their products, mainly plantains, cocoa, coffee and cassava, to contribute to the improvement of the living conditions of our members and their families.”

The founding documents clearly establish a commitment to production systems that integrate environmental conservation with sustainable income generation, specifically including the implementation of agroforestry practices that combine commercial crops and native forest species to maintain Amazonian biodiversity and improve the climate resilience of production systems.

1.2 Foundation of the APEOSAE Federation

The APEOSAE Federation was created in 2006 in response to problems in the cocoa, coffee and plantain production chains in the southern Ecuadorian Amazon, and was legally established as a federation in 2014. It began with a small group of producers focused on finding solutions to improve the marketing of organic products.

Its evolution has been remarkable: in 2011, it won second place in the Taza Dorada competition, a national contest organised by the Ecuadorian National Coffee Association (Asociación Nacional del Café del Ecuador – Anecafé) since 2007. Its main objectives are highlighting and rewarding the best speciality coffees produced in the country, promoting quality and positioning Ecuadorian coffee internationally, and encouraging innovation and the development of good agricultural practices among producers. In addition, in 2020 APEOSAE was recognised by the United Nations Development Programme (UNDP) for its contribution to the innovative project The Other Bar, which uses blockchain technology to ensure traceability and transparency in the chocolate value chain, allowing consumers to know the exact origin of the cocoa and ensuring that producers receive fair payment. This chocolate bar is made with Amazonian cocoa from APEOSAE, grown under sustainable and deforestation-free conditions, in accordance with the requirements of the European Union Deforestation Regulation (EUDR).

The sustainable and deforestation-free cocoa produced by APEOSAE is certified to ensure that no deforested land is used for cultivation. This responds to the global need to halt forest loss, protect biodiversity and mitigate climate change. APEOSAE has developed an innovative traceability system using satellite technologies and platforms such as Global Forest Watch, through the ProAmazonía platform (Programa Integral Amazónico de Conservación de Bosques y Producción Sostenible – the Comprehensive Amazonian Programme for Forest Conservation and Sustainable Production), which keeps detailed records of farm perimeters. Community producers actively participate by collecting data with smartphones that feed into a forest conservation monitoring system, ensuring that the cocoa is free from deforestation and supporting the transparency and verification required for certification.

This transparent system not only demonstrates that production is free from deforestation, but also strengthens international buyers’ confidence in the quality and sustainability of Ecuadorian Amazonian cocoa, positioning APEOSAE as the first Latin American organisation to export cocoa with these guarantees, backed by traceability platforms and environmental conservation programmes. In addition, in 2024, they successfully resumed exports of organic chifle (plantain) chips and cassava snacks to Europe, thanks to the support of the CREA project (Camino a la Reactivación del Ecuador

Agroalimentario – On the Road to the Reactivation of Agrifood Ecuador) and a project by the international nongovernmental organisation (NGO) Rikolto, consolidating their international channels. APEOSAE is currently a pioneer in obtaining organic certification under the new European Union Regulation 848, which sets out the rules on production, certification, labelling and advertising of organic food and feed, reaffirming its commitment to ecological and responsible production.

In parallel with these commercial achievements, APEOSAE has promoted technological and scientific innovation through strategic alliances with the Amazonian Higher Technological Institute (Instituto Superior Tecnológico Amazónico – ISTAM) and various partner universities. Together, they have developed technical diagnostics, mobile applications and other innovative elements that facilitate the management and marketing of organic products, boosting the productive capacities and competitiveness of their members. The federation has grown to include 130 active producer members and has developed the Sánku trademark, establishing itself as a regional benchmark in Amazonian organic production. Sánku means 'leaf' in the Shuar language and is used to market APEOSAE's three production lines: coffee, cocoa and palm.

1.3 Location of the APEOSAE Federation

The APEOSAE Federation is located in the southern Ecuadorian Amazon, specifically in the provinces of Zamora Chinchipe and Morona Santiago, covering nine cantons: Zamora, Yacuambi, Yantzaza, Centinela del Cóndor, Paquisha, Nangaritza and El Pangui in Zamora Chinchipe; and Gualaquiza and Tiwintza in Morona Santiago (Figure 1). It has 106 hectares of forest, 90 hectares of cacao, 23.5 hectares of caturra coffee, 100 hectares of plantain (*Musa paradisiaca*) and 16 hectares of cassava (*Manihot esculenta*), established in agroforestry systems.

This region is characterised by its tropical and subtropical rainforest ecosystem, with altitudes ranging from 800 to 1,700 metres above sea level, with climatic conditions that favour the production of high-altitude coffee, fine aroma cocoa and organic plantains. The natural vegetation consists of cloud forests and Amazonian piedmont jungle, with high biodiversity that includes native timber and fruit tree species that are naturally integrated into the agroforestry systems implemented by producers.

1.4 Membership of the APEOSAE Federation

The APEOSAE Federation has 130 producers distributed across 34 communities, of which 64 are women (49.2%) and 66 are men (50.8%), although it faces a significant generational challenge with only 15 young people under the age of 30 (11.5% of the total). The average size of members' properties vary by area, but generally ranges from 5 to 15 hectares. Approximately 70% of this area is devoted to commercial crops such as coffee (*Coffea arabica*), cacao (*Theobroma cacao*) and plantain (*Musa paradisiaca*), integrated into agroforestry systems, while the remaining 30% is used for subsistence crops and forest conservation. The federation was established mainly around the production, processing and marketing of three main product lines: organic coffee, fine aroma cacao and plantains, all under agroforestry systems that include native forest species such as Andean cedar, Ecuador laurel, guayacán and fruit trees such as avocado and citrus, maintaining a balance between commercial production for specialised markets and family food security.

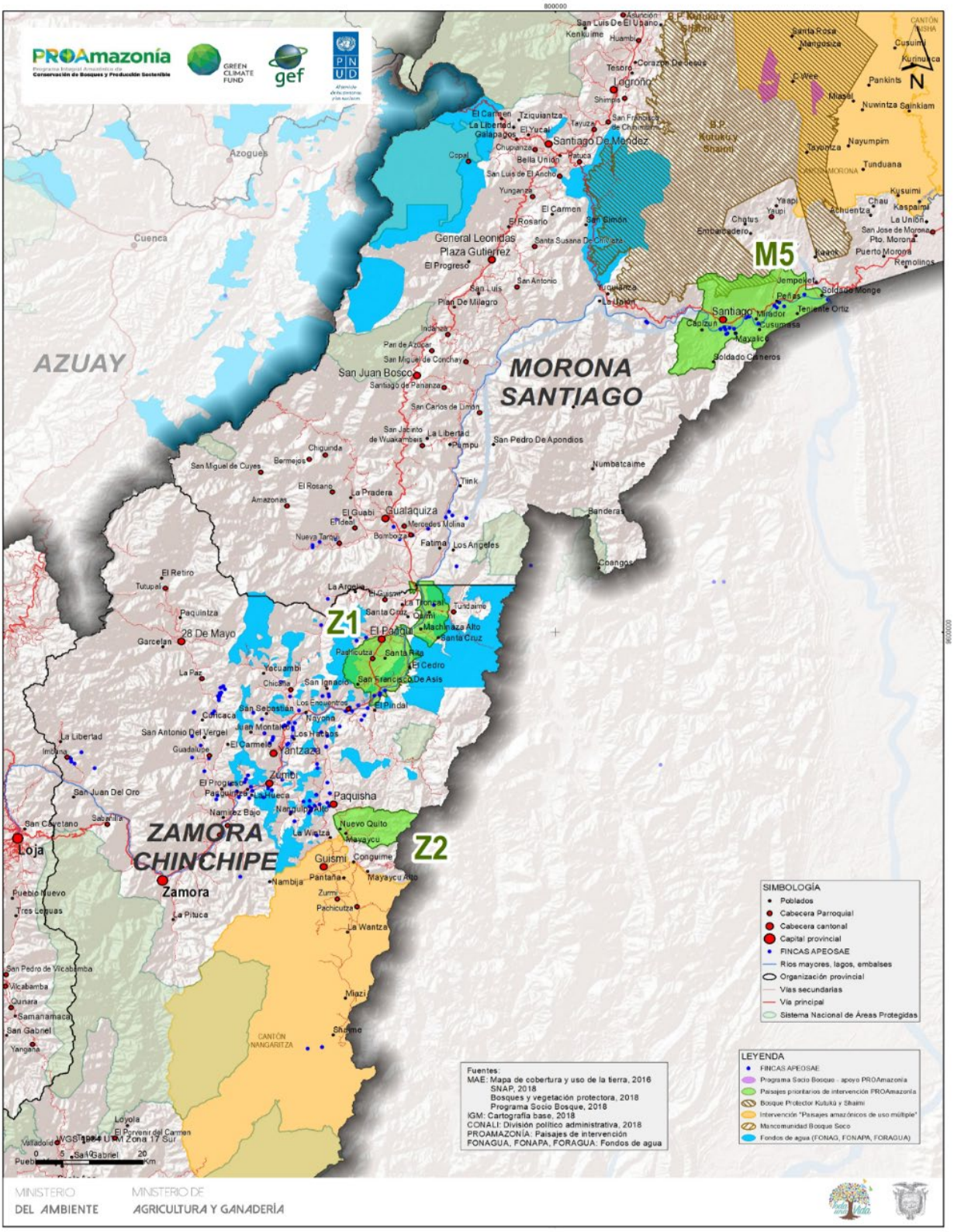


Figure 1. Location of the APEOSAE Federation

2. Agroforestry systems practiced

APEOSAE members practice a multilayered production system that seeks to mimic the natural structure of the tropical forest, maximising the productivity of commercial crops while conserving the ecosystem services of the forest, such as climate regulation, biodiversity conservation and soil protection. The model has been specifically adapted to the ecological conditions of the Southern Amazonian Green Belt, where Shuar, Saraguro and mestizo producers have developed and enriched traditional knowledge on integrated forest management, achieving a balance between sustainable production and environmental preservation.

2.1 Types of agroforestry system

Table 1 details the agroforestry systems that the APEOSAE Federation has adopted, a model of commercial crops grown under shade that integrates coffee, cacao and plantain as the main crops, combined under a diversified canopy of native Amazonian forest species.

Table 1. Agroforestry systems adopted by the APEOSAE Federation

Province	**District/region**	**Agroforestry systems implemented**	**Description**
Zamora Chinchipe	Zamora, Yacuambi, Yantzaza, Centinela del Cóndor, Paquisha, Nangaritza and El Pangui	Agroforestry systems of commercial crops under shade (cocoa, coffee, plantain, cassava, corn, Chinese potato), diversified family gardens, fodder banks, integrated fruit trees and medicinal plants	Shade-grown cacao and coffee systems predominate, associated with timber and fruit species (guava, chonta, citrus). Basic crops and root crops for home consumption and sale are also included. Diversified family gardens incorporate medicinal plants and local species. Firewood and residues are used for sale, and some include fodder banks for animals.
Morona Santiago	Gualaquiza and Tiwintza	Agroforestry systems of commercial crops under shade, diversified family gardens, integrated fruit trees and medicinal plants, fodder banks	Systems similar to Zamora Chinchipe, with an emphasis on shade-grown cocoa and plantains, associated with timber and fruit species. Family gardens include basic crops, root crops and medicinal plants. There is integration of fodder banks and use of residues (firewood, timber, fruits) for local sale.

2.2 Main agroforestry components and species

The agroforestry system promoted by the APEOSAE Federation in the southern Amazon region of Ecuador is organised into multiple layers that integrate native species and crops of high economic, nutritional and medicinal value (see also Appendix 2).

- The upper layer is dominated by Amazonian timber trees such as Andean cedar (*Cedrela montana*), Ecuador laurel (*Cordia alliodora*), guayacán (*Tabebuia chrysantha*) and seique (*Jacaranda copaia*), which provide regulated shade, encourage the presence of birds and

insects by preserving the local biological corridor and representing a long-term sustainable forest resource.

- The middle layer comprises fruit trees and legumes such as guaba (*Inga edulis*), chonta (*Bactris gasipaes*), guava (*Psidium guajava*), citrus fruits such as lemon (*Citrus limon*), orange (*Citrus sinensis*) and mandarin (*Citrus reticulata*), as well as soursop (*Annona muricata*), peanuts (*Arachis hypogaea*) and beans (*Phaseolus vulgaris*). Medicinal plants include guayusa (*Ilex guayusa*), dragon's blood (*Croton lechleri*), matico (*Piper aduncum*) and ayahuasca (*Banisteriopsis caapi*). These crops diversify income sources through the sale of surplus products and contribute to improving soil fertility.
- The main commercial and subsistence crops of the region are grown in the lower stratum, including fine-aroma cocoa (*Theobroma cacao*), Arabica coffee (*Coffea arabica*), plantain (*Musa paradisiaca*), cassava (*Manihot esculenta*), corn (*Zea mays*) and Chinese potato (*Xanthosoma sagittifolium*), along with vegetables and other short-cycle foods.

This stratified arrangement optimises productivity and strengthens family food security, generating an approximate 20% increase in income from the sale of agroforestry products, while contributing to the conservation of essential ecosystem services such as wind protection and efficient water management.

The agroforestry system integrates ancestral knowledge and sustainable practices adapted to local conditions and is promoted mainly by APEOSAE technicians through training workshops and, especially, demonstration plots implemented on the farms of volunteer partners selected for their productive diversity and commitment to sustainability. These plots are managed by the federation's technical team in coordination with community promoters and partners such as ISTAM and cooperation programmes. Their main function is to demonstrate sustainable agroforestry practices in the field to facilitate practical training for producers and validate techniques such as crop stratification, the use of bio-inputs, proper shade management and product traceability. In addition, the plots promote horizontal knowledge transfer among producers under real conditions, allowing agroecological innovations to be adapted and consolidated according to real conditions, as detailed in Table 2.

An agroforestry system including cocoa and timber species © CT Suquisupa Herrera

Table 2. Descriptions of the strata within APEOSAE's agroforestry systems

Stratum/category	**Main species**	**Functions, services or descriptions according to farmers**
High	Andean cedar (*Cedrela montana*) Ecuador laurel (*Cordia alliodora*) Guayacán (*Tabebuia chrysantha*) Seique (*Jacaranda copaia*)	Provide regulated shade, contribute to ecosystem conservation, attract birds and insects, represent long-term forest assets.
Medium	Guaba (*Inga edulis*) Chonta (*Bactris gasipaes*) Guava (*Psidium guajava*) Citrus (*Citrus limon, C. sinensis, C. reticulata*) Soursop (*Annona muricata*) Peanuts (*Arachis hypogaea*) Beans (*Phaseolus vulgaris*) Medicinal plants: Guayusa, dragon's blood, matico, ayahuasca	Diversification of income, improvement of soil fertility (nitrogen fixation), medicinal benefits, strengthening of food security, and provision of fruits and medicinal plants for consumption and sale.
Low	Fine-aroma cocoa (*Theobroma cacao*) Arabica coffee (*Coffea arabica*) Plantain (*Musa paradisiaca*) Cassava (Manihot esculenta) Corn (*Zea mays*) Chinese potato (*Xanthosoma sagittifolium*) Vegetables and short-cycle foods	Main production for family and commercial consumption, economic base of the agroforestry system, contributes to food security and stable income generation.
Basic crops	Cassava (*Manihot esculenta*) Corn (*Zea mays*) Chinese potato (*Xanthosoma sagittifolium*) Vegetables and short-cycle foods	Production for household and commercial consumption, food diversification, increased self-sufficiency and improved quality of the family diet.
Root crops	Cassava (*Manihot esculenta*) Chinese potato (*Xanthosoma sagittifolium*)	Staple foods for household consumption, contributing to food security and resilience to economic and climate change.
Fodder banks	Guaba (*Inga edulis*) Peanuts (*Arachis hypogaea*) Beans (*Phaseolus vulgaris*)	Improve soil fertility through nitrogen fixation, serve as a source of fodder for animals, diversify income and contribute to the sustainability of the agroforestry system.

2.3 Scale of agroforestry farms

The agroforestry areas managed by individual APEOSAE producers vary between 1 and 6 hectares per family, with an average of 3 hectares dedicated specifically to commercial agroforestry systems. Land tenure is mainly private, with individual property titles issued by the National Institute of Agrarian Development (INDA), although in the case of the Shuar communities there is also a community land-management component where decisions on land use are made collectively, respecting the life plans and land-use plans of each community. This mixed tenure structure facilitates both family decision-making on productive management and community coordination for forest conservation, watershed management and group marketing, creating a land-management model that combines individual rights with collective responsibilities towards the conservation of the Amazon ecosystem.

An agroforestry system including strata of trees, plantain and cacao © CT Suquisupa Herrera

An APOESAE agroforestry system being implemented © CT Suquisupa Herrera

An agroforestry system in the Shuar community © CT Suquisupa Herrera

3. Motivation to adopt agroforestry systems

3.1 Origin and promotion of agroforestry

The promotion of agroforestry systems in the APEOSAE Federation formally began in 2014 when the organisation was legally established as a federation, although traditional agroforestry practices had existed among Shuar and Saraguro producers for much longer. The promotion process was led by the APEOSAE technical team in coordination with partner organisations such as ProAmazonía, Lundin Gold, Ethiquable (a Fairtrade chocolate-producing company) and the Ministry of Agriculture, Livestock, Aquaculture and Fisheries (Ministerio de Agricultura, Ganadería, Acuacultura y Pesca – MAGAP), which provided specialised training and technical assistance for the establishment of diversified production systems. According to the surveys conducted for this case study, both male and female producers identify that the initial persuasion was based on demonstrating the tangible economic benefits of integrating native forest species with commercial crops, especially after the recognition obtained in 2011 when APEOSAE won second place in the Taza Dorada competition, which validated the superior quality of coffee produced under shade. The process used participatory methodologies that included community workshops, experiential exchanges between producers of different nationalities, and the establishment of demonstration plots in the nine communities where the federation operates, taking advantage of the ancestral knowledge of forest management of the Indigenous peoples to adapt modern agroforestry techniques.

The APEOSAE Federation has several strengths that support the development of agroforestry in the region, including its extensive experience in certified organic production, which guarantees the quality and sustainability of its products. In addition, its consolidated presence in international markets has expanded commercial opportunities and allowed it to position its products in specialised niches.

In this context, the existence of an established trademark, Sánku, plays a fundamental role. Launched in 2021 with support from cooperation programmes, the Sánku brand represents APEOSAE's three production lines: coffee, cocoa and plantain. This collective brand is used as a strategy to strengthen institutional income through the direct sale of processed agroforestry products, such as cocoa paste, roasted and ground coffee, cassava chips and plantain chips. Under the Sánku brand, both domestic and international consumers are guaranteed value-added, sustainable products with recognised traceability. Furthermore, collaboration with organisations such as Oxfam Belgium has made it possible to increase visibility and access to international markets, strengthening the image and confidence in the federation's agroforestry products at local and global levels. This contributes decisively to increasing the perceived value of production and promoting fair and responsible trade.

Opportunities driving diversification include growing global demand for organic products, the opening of specialised markets interested in products originating from the Amazon, and the constant support of international cooperation, which provides resources and technical support to strengthen and expand productive initiatives.

3.2 Nutritional benefits

For this case study, to determine the benefits derived from the adoption of the agroforestry system promoted by the APEOSAE Federation, a balanced group of 20 members (composed of 10 men and 10 women, distributed in the provinces of Zamora Chinchipe and Morona Santiago) was interviewed (for a list of participants, see Appendix 2). The survey included questions related to nutritional, economic, ecological and social benefits, as well as perceived disadvantages. The perceived nutritional benefits are listed in Table 3.

Table 3. Perceived nutritional benefits of agroforestry systems by men and women farmers

Nutritional benefit	Men (%)	Women (%)
Increase in the quantity and diversity of food for the household	60	40
20% increase in food availability and possibility of selling leftovers	50	30
Diversification of the family diet through the inclusion of fruit trees and medicinal plants	10	10
Consumption of staple crops (cassava, plantains, corn, Chinese potatoes, coffee, cocoa)	100	100
Fruit consumption (chonta, guaba, citrus fruits, papaya, guava, others)	60	60
Consumption of medicinal plants (guayusa, dragon's blood, matico, aloe vera, rue, aritaco, plantain, others)	20	20

Table 3 shows that APEOSAE members clearly and enthusiastically value the benefits that agroforestry systems have brought to their farms, especially in terms of nutrition. One hundred percent of respondents, both men and women, say that the integration of crops such as fine-aroma cocoa, coffee, plantains, cassava and a variety of fruits (guava, chonta, citrus, papaya), as well as vegetables and medicinal plants, has significantly increased the quantity and diversity of food available in their households. This increase in product variety has improved the quality of family nutrition, strengthening self-sufficiency and reducing dependence on food purchased outside the farm.

Sixty percent of men and 40% of women report that they now consume more fruits and medicinal plants grown in their own agroforestry systems, allowing them to prepare more nutritious and balanced meals throughout the year. In addition, 50% of men and 30% of women report that, thanks to increased production, they can sell surplus crops (fruit, firewood, timber, charcoal), generating additional income and improving the family economy.

Both men and women agree that these benefits go beyond food: agroforestry systems strengthen food security, improve the overall wellbeing of their families, and increase resilience to economic and climate change. In short, the implementation of these systems has improved the quality of life and sense of autonomy of APEOSAE member families.

3.3 Economic benefits

According to the testimonies collected in the surveys and described in Table 4, most agree that the agroforestry system has meant a real and tangible improvement in their family income

Table 4. Perceived economic benefits of agroforestry systems by men and women farmers

Economic benefit	% Men	% Women
Increase in income from the sale of organic coffee and fine cocoa	90	10
Take advantage of premium prices and exports (eg Oxfam Belgium)	90	100
Diversification of income (fruit, processed products, handicrafts)	60	100
Greater autonomy and financial stability	60	100
Substantial improvement in family income compared to previous systems	100	100
Commitment to value-added ventures and direct sales	70	100

Fifty percent of respondents say they have experienced an increase in income since implementing the system, either moderate or significant. Both men and women highlight the importance of selling cocoa, plantains and coffee as their main sources of income, but they also emphasise the value of being able to sell leftovers and additional products, such as fruit from the fruit trees (guava, chonta, guava, citrus fruits), firewood and semi-woody tree products, which represent up to a 20% increase in their household economies.

In particular, women have found product diversification to be a way to strengthen their autonomy and household financial stability. One hundred percent of the women surveyed recognise that the possibility of selling fruit, processed products and handicrafts gives them greater independence from fluctuations in coffee and cocoa prices. In addition, many of them show a total commitment to the development of small businesses and direct sales in local markets, which allows them to actively contribute to the wellbeing of their families and communities.

Men, for their part, particularly value access to specialised markets and the opportunity to obtain premium prices, as in the case of coffee and cocoa exports through contracts with international organisations. However, they also recognise that the sale of surplus and additional products is an important source of supplementary income.

3.4 Ecological benefits

Table 5 shows the ecological benefits APEOSAE producers have observed on their farms thanks to agroforestry systems. Both men and women agree that the arrival of more birds, bees and pollinating insects is one of the most noticeable changes, which they consider a sign that their plots are helping to restore biodiversity and maintain the biological corridors that connect with the forests of the Amazon region.

Women particularly highlight how tree and plant cover has improved water conservation and soil protection. They observe that shade and leaf litter maintain moisture during dry seasons, and that leaf decomposition, together with the presence of leguminous species such as guaba, has enriched soil fertility, reducing the need for external fertilisers. They also emphasise that these systems help prevent erosion and protect water sources, ensuring the future productivity of their crops.

Table 5. Perceived ecological benefits of agroforestry systems by men and women farmers

Ecological benefit	Men (%)	Women (%)
Increase in the arrival of birds and insects (preservation of biological corridors)	40	40
Improvement in soil fertility	20	10
Increased shade and microclimate regulation	20	30
Conservation of native species and protection of water resources	10	10
Erosion reduction and soil structure improvement	10	10

For their part, the men highlight the role of the tree canopy in regulating the microclimate and protecting against strong winds, factors they consider key to good coffee and cocoa production. Many mention that the shade provided by the trees not only protects the crops but also attracts native bees, which are essential for pollination.

Both groups value these agroforestry systems not only for improving agricultural production, but also for contributing to the conservation of native species and the protection of natural resources. Producers feel that they are actively contributing to the conservation of the Amazonian ecosystem and to the commitment to keep their territories free from deforestation, which gives them a sense of pride and responsibility towards future generations.

3.5 Social benefits

Table 6 shows the social benefits that agroforestry systems bring to APEOSAE member families, demonstrating a significant impact on community cohesion, cultural transmission and gender equality. The women surveyed emphasise that the agroforestry system strengthens the ancestral traditions of the Shuar and Saraguro peoples, facilitating the transmission of knowledge about the management of native species and their medicinal, food and ritual uses. The men also highlight that crop diversity allows practices such as community *minga* (work parties) and product exchanges between families to continue, reinforcing traditional bonds of solidarity and reciprocity.

Table 6. Perceived social benefits of agroforestry systems by men and women farmers

Social benefit	Men (%)	Women (%)
Strengthening of organisation and collective work	80	90
Transmission of traditional knowledge and skills	60	70
Greater integration and empowerment of women in decision-making	20	60
Improvement of quality of life and family wellbeing	70	70
Participation in training, workshops and exchange opportunities	90	100
Sense of pride and belonging in preserving the Amazonian territory and identity	60	70

Women also emphasise their growing participation in decision-making and farm management, noting that the agroforestry system has opened up opportunities for women's empowerment and integration into productive and organisational activities. All of the women surveyed and 90% of the men have participated in training, workshops and exchange forums, which has strengthened collective learning and a sense of belonging.

For their part, the men particularly value the opportunity offered by the system to integrate several generations into productive work, although they recognise the challenge of motivating young people to become more actively involved. Both men and women agree that the complexity and diversity of the

agroforestry system requires greater family and community collaboration, strengthening organisational structures and creating learning spaces where older people can pass on ancestral knowledge to younger people.

3.6 Disadvantages

As shown in Table 7, the main disadvantages identified by APEOSAE producers in the implementation of agroforestry systems clearly differentiate perceptions according to gender. The results show that both men and women recognise that the agroforestry system involves significant challenges, although there are nuances in the intensity and type of difficulties identified by each group.

Table 7. Perceived disadvantages of implementing agroforestry systems by men and women farmers

Disadvantages	**% Men**	**% Women**
Requires more labour and management time	80	90
Difficulty accessing specialised technical assistance	60	70
Low initial income (long-term return)	70	60
Complexity in managing multiple crops	60	80
Limitations on marketing all products	50	70
High organic certification costs	40	50
Lack of adequate machinery for diversified systems	50	40
Difficulty controlling pests and diseases	60	60
Less access to specific loans for agroforestry	30	40
Low participation of young people in the system	50	60

The disadvantage most frequently cited by both genders is the need for more labour and management time, mentioned by 80% of men and 90% of women. This reflects the fact that managing diversified systems requires more daily work and planning, which can be particularly challenging for women, who often also take on domestic responsibilities.

Another significant challenge is access to specialised technical assistance, perceived as an obstacle by 60% of men and 70% of women. This data highlights the need to strengthen training and technical support services, especially for women, who may face greater barriers to accessing training and advice. Seventy percent of men and 60% of women consider initial income to be low and the economic return to be long term, which can generate uncertainty and discourages adoption of the system, particularly in the early stages of establishment. Meanwhile, the complexity of managing multiple crops is a concern for 60% of men and 80% of women, suggesting that the workload and the need for technical knowledge affect them differently, with a greater impact on women.

Other disadvantages mentioned include limitations on marketing all products (50% of men, 70% of women), high organic certification costs (40% of men, 50% of women), lack of adequate machinery (50% of men, 40% of women) and difficulty in controlling pests and diseases (60% of both genders). In addition, the lower availability of specific credit and the low participation of young people in the system are additional challenges that concern both groups, although with a higher incidence among women.

4. Design and installation of agroforestry systems

4.1 Guidance from the APEOSAE Federation on agroforestry installation

The APEOSAE Federation is committed to caring for the environment, mitigating climate change and sustainable production in harmony with nature. It has developed a comprehensive process for the design and installation of agroforestry systems adapted to the southern Amazon region of Ecuador. The training is led by a multidisciplinary technical team that includes agricultural engineers, forestry technicians and ancestral promoters from the Shuar and Saraguro communities, thus ensuring a combination of scientific and traditional knowledge.

According to surveys conducted, APEOSAE's training process is designed to respond to the ecological and cultural needs and characteristics of the Amazon region. In accordance with its regulations and organisational principles, the federation has promoted the collective implementation of agroforestry production systems among its members, adapting to local agroecological conditions and respecting the cultural preferences of each community, rather than relying on established demonstration plots. This approach allows for the practical and contextually relevant application of agroforestry techniques directly on producers' farms, promoting learning and the effective adoption of the system.

Eighty per cent of the male and female producers surveyed highlight that the training includes theoretical and practical workshops on the stratification of the system, addressing the management of the upper-canopy stratum with Amazonian timber species such as Andean cedar and Ecuador laurel, the middle stratum with fruit trees such as citrus and legumes such as guaba, and the lower stratum with commercial and subsistence crops such as coffee, cocoa, plantain and cassava. Participatory methodologies are used that respect and value traditional knowledge, promoting collective learning and local innovation.

In addition, technical guidance is complemented by exchanges of experiences between producers from different communities, which allows the cultural diversity of the federation to be leveraged and technical proposals to be enriched with ancestral knowledge of Amazonian forest management. In this way, APEOSAE strengthens its members' capacity to implement resilient, productive and sustainable agroforestry systems, actively contributing to biodiversity conservation, soil protection and climate change adaptation in the region.

An agroforestry system for coffee cultivation associated with critical species © CT Suquisupa Herrera

4.2 Seed sources

Seed sources for the establishment of agroforestry systems in APEOSAE have been diversified and strengthened in recent years, thanks to coordination with public institutions and community work. Currently, most of the genetic plant material for the different strata (forest, fruit and associated crops) is provided by the provincial government of Zamora Chinchipe and MAGAP, which deliver certified seeds and seedlings as part of their production promotion and environmental restoration programmes.

In addition, the producers surveyed indicate that a significant portion of the seeds continue to be obtained through community exchanges organised by the federation. In these spaces, each family selects and preserves seeds from the best plants on their farm to share with other members, thus ensuring local adaptation and genetic diversity. The federation also maintains a community seed bank, where native varieties of Amazonian species are preserved. This initiative is led by APEOSAE and mainly by women, who are traditionally recognised as guardians of genetic diversity in the communities.

APEOSAE also maintains strategic alliances with international cooperation agencies and NGOs such as ProAmazonía, Oxfam and Ethiquable, which have facilitated access to improved varieties of coffee and cocoa, as well as native forest species for the enrichment of the systems. Community nurseries have been developed in six of the nine main communities, where plant material is produced under certified organic standards, combining traditional propagation techniques with modern seedling production methodologies.

Protecting timber saplings within an agroforestry system © CT Suquisupa Herrera

4.3 Management

The producers of the APEOSAE Federation have identified the main challenges in managing the agroforestry system as integrated pest and disease management, adequate shade regulation to optimise the productivity of commercial crops, and the coordination of cultural tasks in complex production systems. To address these needs, APEOSAE has developed a comprehensive technical assistance programme for the organic production and management of crops such as caturra coffee

(*Coffea arabica*), cacao (*Theobroma cacao*), plantain *(Musa paradisiaca*), and agroforestry system management, combining traditional knowledge with appropriate technologies. The federation strengthens this work through strategic alliances with universities, research centres and international organisations, which facilitates access to specialised training in organic production, agroforestry management and value-added product processing.

The organisation and management of technical support is carried out by community promoters who live in the same communities and have specific knowledge of crop management and organic regulations implemented in agroforestry systems. This allows them to be close to producers and understand their needs first-hand. They act as a direct link with the APEOSAE technical team. This work is planned and coordinated through frequent visits, practical workshops and participatory monitoring, accompanying farmers so that they can effectively apply the best agroforestry practices. In this way, they contribute not only to improving crop productivity and sustainability, but also to ensuring that organic certification standards are met, always adapting to the local conditions and realities of each area. Trained in each area, they maintain constant contact with producers and coordinate with the central technical team to address specific problems. According to the survey, both men and women agree that the management system includes regular technical visits, ongoing training workshops and participatory monitoring that allows problems to be identified and resolved in a timely manner.

In addition, the federation has implemented a system for recording and monitoring agroforestry practices that facilitates organic certification under international standards, including the recent European Union Regulation 848. This means that all agricultural processes must comply with strict standards that avoid the use of synthetic agrochemicals, promote sustainable production practices, and conserve soil fertility and biodiversity. To obtain and maintain this certification, the federation carries out rigorous documentary and physical monitoring, including detailed records of agricultural activities, control of permitted inputs, and internal and external audits. This ensures that products such as cocoa, coffee and other crops are grown with respect for the environment and human health, opening doors to specialised markets with high quality and sustainability demands, and traceability, which consists of a comprehensive system that allows the product to be tracked from the farm to the consumer. Currently, this is done through field records, physical receipts and protocols at the collection stages. However, the federation is currently in the process of acquiring new software to facilitate digital documentation, data management and information validation, combining conventional methods with modern technologies. This system ensures transparency, organic authenticity and compliance with international certifications, which is essential for accessing markets with high standards such as deforestation-free cocoa required to access specialised markets, integrating traditional field observation methodologies with modern documentation tools, thus guaranteeing compliance with international quality and sustainability standards.

5. Aggregation and sale of agroforestry products

5.1 Markets for products

Table 8 shows how the marketing of APEOSAE agroforestry products from internal data on the wider membership focuses on three main production lines under the Sánku brand: organic coffee, fine aroma cocoa and processed plantains, which are sold in local, national and international markets with different levels of processing and added value.

Table 8. Market for products produced by APEOSAE's agroforestry systems

Product	% of producers selling product	Presentation and added value	Market destination
Organic coffee (Sánku brand)	25	Dry parchment, roasted coffee, ground, packaged	Domestic, potential export
Fine aroma cocoa (Sánku brand)	87.5	Dried beans, paste, artisanal chocolate	Domestic and international
Processed plantain (chips, Sánku brand)	81.2	Organic chips, packaged and labelled	Domestic and international (Oxfam Belgium)
Processed cassava (chips)	75	Organic chips, packaged	International (Oxfam Belgium)
Native fruit trees (guaba, chonta, citrus, guava, papaya, avocado)	56	Fresh fruit, occasionally processed	Local and national
Firewood, balsa, charcoal, guava wood	50	Firewood, wood, charcoal	Local
Corn, beans, Chinese potatoes	25 (corn), 6.25 (Chinese potatoes)	Dry grain, fresh	Local
Medicinal plants (matico, aloe vera, rue, plantain, aritaco)	25	Fresh, prepared by hand	Local
Dried parchment coffee	25	Pergamino beans	Domestic

Commercial products include dry parchment coffee, which is the pulped and dried coffee bean that still retains a protective layer called parchment, allowing it to be stored and transported before roasting. Roasted coffee is also marketed, both with potential for national and international markets. Cocoa is sold as dried beans and processed into fine chocolate, while organic plantain and cassava chips have been exported under contract with Oxfam Belgium since 2024. End markets range from local traders in Zamora Chinchipe and Morona Santiago to national and international niches that value the deforestation-free certification that characterises APEOSAE as Ecuador’s first sustainable cocoa exporter.

For subsistence consumption, native fruit trees such as avocado, citrus and guava are grown, as well as staple crops and forest species for medicinal and construction use. Basic products are processed at the community level, while higher value-added products are processed in centralised facilities, using biodegradable packaging and labelling that highlights the Amazonian origin and organic certification that distinguishes the federation in specialised markets.

5.2 Changes over time in enterprise initiatives

The evolution of marketing in APEOSAE shows a significant transformation since its foundation in 2006, when producers mainly sold unprocessed raw materials, to the current development of a consolidated brand with value-added products. Initially, members marketed parchment coffee and cocoa beans to local intermediaries at variable prices and without certification, but starting in 2014, with its legal constitution as a federation, a systematic process of value addition began, including obtaining organic certifications and developing processing capacities.

APEOSAE has played a crucial role in this change through the establishment of community processing infrastructure, the creation of the Sánku brand in 2021, and the development of strategic commercial alliances that have provided access to specialised markets. The impacts on the functioning of the agroforestry system have been positive, as demand for certified and deforestation-free products has encouraged producers to maintain and improve their agroforestry practices, increase the biodiversity of their production systems, and adopt more sustainable technologies.

The recognition obtained in 2020 from UNDP for APEOSAE's contribution to the The Other Bar project and the certification as a clean production territory in 2023 have validated the federation's production model and opened up new commercial opportunities that reinforce the economic viability of complex agroforestry systems.

5.3 Future plans

APEOSAE's future strategies to develop the agroforestry system and improve commercial income are based on its 2025–2030 institutional strategic plan, which includes production diversification, the strengthening of commercial alliances and innovation in value-added products. External social networks and contacts managed by the federation include partnerships with ProAmazonía for deforestation-free certification, agreements with Oxfam Belgium for the export of processed products, and participation in provincial roundtables by product that facilitate access to favourable public policies.

The agroforestry system development plans include the implementation of a forest enrichment programme with native species of high commercial value, such as guaba (*Inga edulis*), Andean cedar (*Cedrela odorata*), Ecuador laurel (*Cordia alliodora*), samique (*Pouteria caimito*) and chonta (Bactris gasipaes). It also envisages the establishment of new production lines based on Amazonian fruit trees such as samique (*Pouteria caimito*), araza (*Eugenia stipitata*) and guanábana (*Annona muricata*), as well as medicinal plants, and the development of community-based rural tourism ventures that take advantage of the biodiversity and scenic beauty of agroforestry systems.

The federation plans to expand its processing capacity by building a fruit-processing plant and implementing dehydration and packaging technologies that will allow it to diversify its range of own-brand products. Future commercial strategies include seeking additional certifications such as Fairtrade and Rainforest Alliance, developing carbon markets based on the ecosystem services of agroforestry systems, and creating direct commercial alliances with conscious consumers through digital platforms and e-commerce that value the traceability and social impact of Amazonian products.

6. Financing agroforestry activities

6.1 Start-up and running costs

The main costs for establishing and maintaining agroforestry systems in APEOSAE include labour for land preparation, acquisition of forest and fruit seedlings, organic inputs for fertilisation, and cultural maintenance tasks such as pruning and phytosanitary control. The producers surveyed indicate that the most significant initial costs are labour for establishing the system, estimated at between US$800 and US$1,200 per hectare during the first two years, including site preparation without burning, planting forest and fruit species, and establishing commercial crops under regulated shade. The costs of native forest seedlings represent approximately US$300 to US$500 per hectare, depending on planting density and the species selected, while certified organic inputs for fertilisation and phytosanitary control require an annual investment of US$200 to US$350 per hectare. Maintenance costs include pruning for training and shade regulation (US$150 to US$250 per hectare per year), weed control (US$180 to US$300 per year), and harvesting and post-harvest activities, which vary depending on the products and volumes obtained. Producers point out that although initial costs are higher than traditional monocultures, product diversification and the premium prices obtained for certified organic products offset the additional investment from the third year onwards, when the system reaches production stability and the forest trees begin to provide tangible benefits in terms of climate regulation and soil improvement.

6.2 External finance

External sources of financing for agroforestry systems in APEOSAE come mainly from international cooperation projects and government programmes to support organic production and environmental conservation. The federation has accessed resources through the ProAmazonía programme, which has provided funding for deforestation-free certification and technical capacity building, and through an agreement with Oxfam that includes technical assistance and access to specialised markets for value-added products. The projects have provided approximately 60% of the resources needed to establish agroforestry systems, including technical training, plant material, organic inputs and basic equipment for post-harvest processing.

External financing sources also include decentralised autonomous government programmes that support clean production initiatives, competitive funds for sustainable rural enterprises, and resources from NGOs that promote the conservation of Amazonian biodiversity. Bank loans have been less important due to limited access to formal credit in rural Amazonian areas and collateral requirements that many producers cannot meet. The federation has developed strategies to maximise the use of external resources through the formulation of joint projects that benefit multiple partners, the collective management of certifications, and the negotiation of commercial contracts that include pre-financing components for productive activities and community infrastructure improvements.

6.3 Internal finance

APEOSAE has established an internal financing system based on three main sources that support the economic viability of its agroforestry systems. First, monthly contributions of US$10 from members are distributed between the local organisation and the federation in accordance with the statutes, and are a mandatory commitment despite some difficulties in compliance. Second, contributions of 2% to 3% of the sale value of the gross product delivered to the federation are applied, exclusively to cover the operating costs of organic certification, audits, training and collective marketing services, including logistics, traceability and compliance with export requirements. Finally, income generated from the sale of products processed under the Sánku brand, such as cocoa paste, roasted coffee, and cassava and plantain chips, provides a margin derived from processing and direct marketing. However, given that this is the brand's first year of operation, revenues do not yet represent significant profitability and have been used mainly to cover initial production, packaging and promotion costs.

In addition, the financial system includes community revolving funds made up of solidarity groups of eight to 12 families who guarantee each other, providing interest-free loans for the implementation of agroforestry systems, the purchase of organic inputs and improvements in productive infrastructure. In this context, the Café Mujer initiative stands out. This is a current revolving fund of US$18,000

promoted by APEOSAE in partnership with Café Galletti, Lundin Gold and FEDES UTPL (Fundación para el Desarrollo Empresarial y Social, Universidad Técnica Particular de Loja – Foundation for Business and Social Development, Private Technical University of Loja), which finances projects led by women through interest-free loans of up to US$6,000. The aim is to strengthen this fund to expand its impact on women's entrepreneurship linked to production with APEOSAE. In addition, APEOSAE, like Café Galletti, has the potential to market coffee under the Café Mujer brand nationally and internationally, allocating a portion of these sales to finance the revolving fund. APEOSAE is currently working on the creation of a trust to give greater solidity to this proposal, given that the consortium that initially activated this initiative is currently suspended.

The federation has also created an emergency fund, financed by voluntary contributions from partners with greater economic capacity and technical and commercial resources, to support families in transition to agroforestry systems. In addition, mechanisms such as advance payment for products delivered and labour-exchange schemes between families help to reduce costs and improve the sustainability of the model. Together, these internal resources have financed approximately 40% of the costs associated with agroforestry systems, demonstrating the effectiveness and adaptability of the solidarity-based financing model to the local conditions and cultures of the Ecuadorian Amazon.

6.4 Future plans

APEOSAE's expansion plans, as outlined in its 2025–2030 institutional strategic plan, include increasing the area under agroforestry systems from the current 400 hectares to 600 hectares by the end of the period, which will require an estimated investment of US$500,000 for the establishment of new areas and the improvement of existing systems, with the support of strategic partners. Work is currently underway to establish a trust to integrate and coordinate all these actions, through a specialised consultancy that will consolidate both previous and ongoing initiatives. In this process, strategic partners are being sought to finance and strengthen the proposals. The financing strategy for this expansion includes the management of international cooperation resources for climate change mitigation and biodiversity conservation projects, taking advantage of APEOSAE's position as a pioneer in deforestation-free territories in Ecuador.

In addition, plans include the development of an Amazonian fruit-processing plant with a capacity of 500 tonnes per year, estimated at US$200,000, which will be financed through a combination of own resources, commercial credit and contributions from international partners interested in sustainable Amazonian products. The fruits to be processed include fresh fruits such as soursop (*Annona muricata*), araza (*Eugenia stipitata*) and Amazonian tree peanuts (*Bunchosia glandulifera*). The federation also plans to establish a US$100,000 revolving investment fund to support individual and group ventures of members, which will include the implementation of drainage systems, improvement of community nurseries and capacity building to add value at the household level.

Future financing strategies include exploring carbon markets to monetise the ecosystem services of agroforestry systems, managing resources from multilateral organisations for sustainable rural development projects, and establishing partnerships with private companies interested in deforestation-free supply chains that can provide pre-financing for production expansion and the improvement of quality and certification standards.

7. Conclusions and recommendations

7.1 Key innovations

The decisive innovations implemented by APEOSAE to promote the adoption of diversified agroforestry systems include the development of an intercultural training model that combines modern technical knowledge with the ancestral knowledge of the Shuar and Saraguro peoples, creating a unique pedagogical approach that respects and values local traditions while incorporating appropriate technologies for certified organic production.

The federation has developed an innovative system of demonstration plots distributed across nine communities, each adapted to specific agroecological conditions and designed to showcase different components of the agroforestry system according to local cultural preferences and production needs, facilitating peer-to-peer learning among producers of different nationalities.

In terms of access to seeds and technical knowledge, APEOSAE has established community seed banks managed by women, community nurseries producing plant material under organic standards, and a germplasm exchange system that maintains the genetic diversity necessary for resilient agroforestry systems.

Innovative business options include the development of the Sánku brand for value-added products, the establishment of direct contracts with international buyers such as Oxfam Belgium, and the creation of a differentiation strategy based on organic and deforestation-free production certifications that positions APEOSAE as a pioneer in Ecuador.

In terms of financing, the organisation has developed innovative solidarity finance mechanisms that include community revolving funds, group savings systems and pre-financing schemes based on future commercial contracts, reducing dependence on formal bank credit and strengthening organisational financial autonomy.

7.2 Remaining challenges

The main challenges that remain for APEOSAE include the limited participation of young people in the organisation, with only 15 members under the age of 30 out of a total of 130, which raises questions about the intergenerational sustainability of the agroforestry model and requires specific strategies to attract and retain young people in rural productive activities.

Climate change also represents a growing challenge that affects precipitation and temperature patterns in the Amazon region, requiring adaptations in the design of agroforestry systems and the selection of species that are more resistant to extreme climate variability.

Market challenges include competition with lower-priced conventional products, the volatility of international commodity prices, and growing traceability and certification requirements that require ongoing investment in technology and training.

To overcome these challenges, APEOSAE can implement specific training and youth entrepreneurship programmes that include digital technologies, new product development, and access to specialised markets that attract young people with higher technical training.

The organisation also needs to strengthen its research and development capacities to adapt agroforestry systems to changing climatic conditions, including partnerships with universities and research centres specialising in tropical agroforestry.

Useful external support includes specialised technical assistance in carbon markets and ecosystem services, access to information technologies for traceability and digital marketing, financing for processing and storage infrastructure, and support for organisational capacity development to manage the growing complexity of the federation’s commercial and technical operations.

7.3 Policy support and barriers

APEOSAE members identify the following as the main policies supporting their agroforestry systems: government recognition of clean production territories granted by the Prefecture of Zamora Chinchipe in 2023; policies to promote organic agriculture implemented by MAGAP; and the programmes for the conservation and sustainable use of biodiversity, which provide incentives for agroforestry management.

Support policies also include subsidised organic certification programmes, tariff facilities for the import of organic inputs, and regulatory frameworks that recognise the rights of peoples and nationalities over ancestral territories and traditional knowledge.

However, producers identify significant barriers in the lack of specific rural credit policies for agroforestry systems, which require longer grace periods and differentiated conditions compared to traditional annual crops. Threats include mining policies that could affect territories where the federation operates, changes in environmental regulations that could increase certification costs, and international trade policies that favour conventional products over certified organic products.

Regulatory frameworks for forest resource use in agroforestry systems also present bureaucratic constraints that hinder the sustainable use of native timber species, requiring simplification of procedures for organised small-scale producers.

Fiscal policies do not adequately recognise the ecosystem services provided by agroforestry systems, limiting access to payments for environmental services that could supplement producers' incomes and strengthen the economic viability of complex production systems.

7.4 Policy recommendations

To create an environment more conducive to the adoption of agroforestry systems such as those implemented by APEOSAE, policy changes are needed, including the establishment of specific credit lines for agroforestry with grace periods of 3–5 years and preferential rates that recognise the environmental benefits of these production systems.

Policies should include simplified regulatory frameworks for sustainable forest use in agroforestry systems of organised small producers, facilitating access to management permits and reducing the bureaucratic costs that currently limit the economic viability of the forestry component.

It is recommended to implement payments for ecosystem services programmes that recognise and compensate for the conservation benefits of increased biodiversity, carbon sequestration and watershed protection provided by Amazonian agroforestry systems.

Trade policies should include tariff and tax incentives for certified organic and deforestation-free products, facilitating access to specialised international markets and improving the competitiveness of producers committed to environmental sustainability.

External support partners can contribute through technical assistance for the formulation of favourable public policies, financing for research on tropical agroforestry adapted to Amazonian conditions, and support for institutional capacity building that enables organisations such as APEOSAE to participate effectively in political dialogue and public advocacy.

It is also recommended that partnerships be established between producer organisations, universities, international cooperation agencies and local governments to create knowledge and innovation platforms that facilitate the transfer of appropriate technologies and the scaling up of successful experiences in territories with similar agroecological and sociocultural conditions.

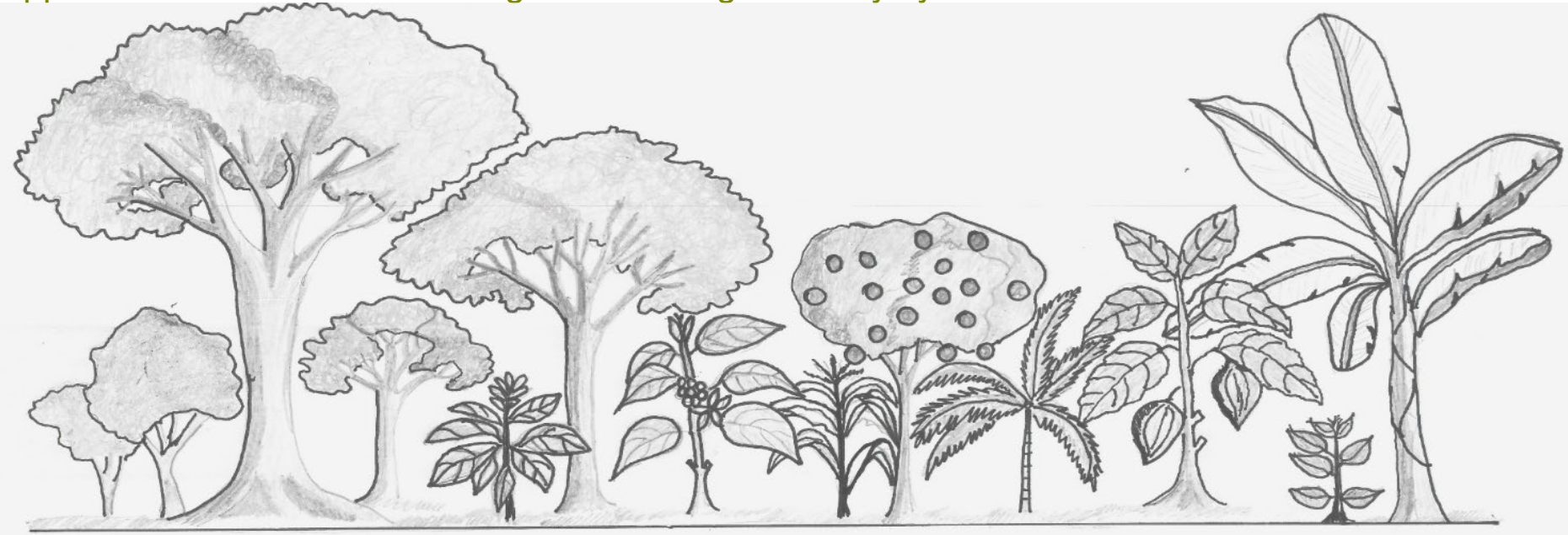
References

APEOSAE Federation (2025) Institutional strategic plan 2025–2030: strengthening organic production in the southern Ecuadorian Amazon. Internal strategic planning document.

Appendix 1. Survey participants – 10 men and 10 women

	Members	Gender	Canton	Parish	Neighbourhood
1	Petronila de Jesús Sandoval Paz	F	Centinela del Cóndor	Triunfo dorado	El Dorado
2	Santos Angel Sandoval Sarango	M	Centinela del Cóndor	Triunfo dorado	El Dorado
3	Zoila Estela Guzman Torres	F	Gualaquiza	Bomboiza	San Pedro de Chumpias
4	Sara Esther Zhunio Zhunio	F	Gualaquiza	Gualaquiza	Gualaquiza
5	María Elena Zapata	F	Nangaritza	Guayzimi	San Francisco
6	Rosa Darma Cueva Correa	F	Paquisha	Paquisha	San Fernando
7	Maria Angelita Morocho Morocho	F	Yacuambi	La Paz	Nuevo Porvenir
8	Manuel Asuncion Minga Macas	M	Yantzaza	Yantzaza	San Ignacio
9	Angel Eduardo Febre Sarango	M	Yantzaza	Chicaña	El Valle
10	Ronald Damián Quezada Ramón	M	Yantzaza	Chicaña	La Unión
11	Luis Antonio Faican Lopez	M	Yantzaza	Chicaña	La Y
12	José Leonardo Armijos Perez	M	Yantzaza	Chicaña	La Y
13	Angel Miguel Silva Cabrera	M	Yantzaza	Los Encuentros	Market
14	María Alejandra Pesantez Morocho	F	Yantzaza	Los Encuentros	Nunkui
15	Maryuri Alexandra Poma Mendoza	F	Yantzaza	Yantzaza	Los Hachoz
16	Ana María Banegas Cuenca	F	Yantzaza	Yantzaza	Los Hachoz
17	Carlos Thomas Suquisupa Herrera	M	Yantzaza	Yantzaza	Mutinza
18	Francisco Numan Tene Valdiviezo	M	Yantzaza	Yantzaza	Simón Bolívar
19	Fanny Nohemi Nantip Tsakimp	F	Zamora	Guadalupe	El Carmen
20	Luis Ángel Salinas Castillo	M	Zamora	Guadalupe	Soapaca

Appendix 2. Cross-sectional diagram of the agroforestry system



Upper stratum	Middle stratum	Lower stratum
Andean cedar (*Cedrela montana*), Ecuador laurel (*Cordia alliodora*), guayacán (*Tabebuia chrysantha*), seique (*Jacaranda copaia*).	Guaba (*Inga edulis*), chonta (*Bactris gasipaes*), guava (*Psidium guajava*), citrus (*Citrus limon, C. sinensis, C. reticulata*), soursop (*Annona muricata*), peanuts (*Arachis hypogaea*), beans (*Phaseolus vulgaris*). Medicinal plants: guayusa (*Ilex guayusa*), dragon's blood (*Croton lechleri*), matico (*Piper aduncum*), ayahuasca (*Banisteriopsis caapi*).	Fine aroma cocoa (*Theobroma cacao*), Arabica coffee (*Coffea arabica*), plantain (*Musa paradisiaca*), cassava (*Manihot esculenta*), corn (*Zea mays*), Chinese potato (*Xanthosoma sagittifolium*), vegetables and short-cycle foods, Guaba (*Inga edulis*), peanuts (*Arachis hypogaea*), beans (*Phaseolus vulgaris*)

Source: The authors