

Innovations to promote adoption of coffee agroforestry in Bolivia: the role of ASOCAFÉ



Agroforestry case studies 1. Bolivia

Jose Luís Escobar Guevara and Boris Fernández Arancibia



Forest and Farm Facility

Sweden Sverige
FINNISH GOVERNMENT
Federal Ministry for Economic Cooperation and Development
giz
Government of the Netherlands
Foreign, Commonwealth & Development Office
Norad
IKEA

Acknowledgements

This case study was commissioned using a template prepared by the International Institute for Environment and Development (IIED) for the Forest and Farm Facility (FFF), a co-management partnership between the Food and Agriculture Organization of the United Nations (FAO), the International Union for Conservation of Nature (IUCN), IIED and AgriCord. The FFF is supported by the governments of Finland, Germany, Norway, the Netherlands, Sweden, the United Kingdom, the United States of America, the European Union and IKEA.

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, 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.

The authors would like to thank the people who participated directly in the study, whose experiences and knowledge were fundamental to this document, including the producers who were interviewed: Juan Quispe Luna, Eugenio Villca Maldonado, Rene Millares Cruz, Yhola Blanca Mamani Titirico, and Clotilde Titirico Wallpa. It is also important to recognise the support and collaboration of the board of directors and technicians of the Asociación de Caficultores de Taipiplaya (ASOCAFÉ). Their work and dedication are essential to the successful functioning of the cooperative and for promoting the adoption of agroforestry systems and improving quality of life.

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the International Institute for Environment and Development (IIED) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether these have been patented, does not imply that these have been endorsed or recommended by IIED in preference to others of a similar nature that are not mentioned. The views expressed in this information product are those of the author(s) and do not necessarily reflect the views or policies of IIED.

IIED is a charity registered in England, Charity No.800066 and in Scotland, OSCR Reg No.SC039864 and a company limited by guarantee registered in England No.2188452. IIED publications may be shared and republished in accordance with the Creative Commons Attribution-Non Commercial-No Derivatives 4.0 International Public License (CC BY-NC-ND 4.0). IIED is happy to discuss further use.

International Institute for Environment and Development, Broughloch, Newington, Edinburgh EH8 9NJ.

www.iied.org / @iied / www.facebook.com/theIIED/ / Download more publications at <http://pubs.iied.org>

Citation: Escobar Guevara, JL and Fernandez Arancibia, B (2025) Innovations to promote the adoption of coffee agroforestry in Bolivia: the role of ASOCAFÉ. ASOCAFÉ and IIED, Edinburgh, UK.

Cover photo: ASOCAFÉ workers in Bolivia © ASOCAFÉ

Corresponding author: Jose Luis Escobar Guevara

Email: jescobargue@gmail.com

Contents

Acknowledgements	2
Contents	3
List of figures and tables	5
Abbreviations	6
Summary	7
1. Introduction to ASOCAFÉ	8
1.1 Name and vision	8
1.2 Foundation	8
1.3 Location	8
1.4 Membership	10
2. ASOCAFÉ's agroforestry system	11
2.1 Type of agroforestry.....	11
2.2 Main species	11
2.3 Other farming activities	15
2.4 Scale	15
3. Motivation to establish agroforestry	17
3.1 Origin and promotion of agroforestry	17
3.2 Nutritional benefits	17
3.3 Economic benefits	17
3.4 Ecological benefits	18
3.5 Social benefits	18
3.6 Disadvantages	19
4. Design and installation of the agroforestry system	20
4.1 Guidance on agroforestry installation	20
4.2 Seed sources	20
4.3 Management issues.....	20
5. Aggregation and sale of agroforestry products	21
5.1 Markets for products	21
5.2 Changes over time.....	22
5.3 Future plans	23
6. Financing agroforestry plots	25
6.1 Start-up and running costs	25
6.2 External finance	25
6.3 Future plans and financial requirements	26
7. Conclusions and recommendations	28
7.1 Key innovations	28
7.2 Remaining challenges	29

7.3 Policy recommendations	29
7.4 General conclusions from a comparison with other case studies	30
7.5 Model agroforestry system adaptable to Bolivian conditions	32
References	35
<hr/>	
Appendix 1. Testimonials from ASOCAFÉ members	36
<hr/>	
Clotilde Titirico Wallpa, Huayna Potosí community, ASOCAFÉ.....	36
Eugenio Villca Maldonado, Ingavi community, ASOCAFÉ.....	37
Juan Quispe Luna, Tres Estrella community, ASOCAFÉ	38
René Millares, Amor de Dios community, ASOCAFÉ	39
Jhola Blanca Mamani Titirico, Villa Victoria C community, ASOCAFÉ	40

List of figures and tables

Figure 1. Location of the ASOCAFÉ case-study site in Bolivia	9
Figure 2. ASOCAFÉ coffee products and Madre Selva coffee brand packaging © ASOCAFÉ	9
Figure 3. Diagram of coffee agroforestry system by Juan Quispe Luna	11
Figure 4. Typical canopy structure of a mature coffee agroforestry system © ASOCAFÉ	12
Figure 5. Common design of the shade coffee agroforestry system.....	14
Figure 6. Diagram of coffee agroforestry system by Clotilde Titirico Wallpa	36
Figure 7. Diagram of coffee agroforestry system by Eugenio Villca Maldonado.....	37
Figure 8. Diagram of coffee agroforestry system by Juan Quispe Luna	38
Figure 9. Diagram of coffee agroforestry system by René Millares	39
Figure 10. Diagram of coffee agroforestry system by Yola Mamani Titirico	40
Table 1. Different species within different agroforestry component strata	15
Table 2. Main markets for ASOCAFÉ members	21
Table 3. International buyers of ASOCAFÉ products	21
Table 4. Future plans of ASOCAFÉ's membership.....	23
Table 5. Main costs of managing the agroforestry system	25
Table 6. ASOCAFÉ's future plans and their financial implications.....	26
Table 7. Summary of ASOCAFÉ's main innovations in promoting agroforestry.....	28
Table 8. Persistent challenges faced by ASOCAFÉ	29
Table 9. Common elements between four coffee-based agroforestry systems	30
Table 10. Proposed diversified coffee agroforestry model, adaptable to Bolivian conditions	32
Table 11. Common benefits and disadvantages of agroforestry systems for coffee	33
Table 12. Summary of findings and recommendations from four Bolivian agroforestry case studies.....	34

Abbreviations

AFS	Agroforestry system
Aprocafe Bolivia	Asociacion de Productores de Cafe Ecologico (Association of Organic Coffee Producers)
ASOCAFÉ	Asociación de Caficultores de Taipiplaya (Coffee Growers Association of Taipiplaya)
CELCCAR	Central Local de Cooperativas Agropecuarias Caranavi (Local Centre of Agricultural Cooperatives of Caranavi)
CIAPEC	Cooperativa Integral Agrícola de Productores Ecológicos (Comprehensive Agricultural Cooperative of Organic Producers)
CLAC	Latin American and Caribbean Network of Fair Trade Small Producers and Workers
EUDR	European Union Deforestation Regulation
FAO	Food and Agriculture Organization of the United Nations
FFF	Forest and Farm Facility
FFPO	Forest and farm producer organisation
IIED	International Institute for Environment and Development
PROEX	Programme to Support the Promotion of Growth and Export Diversification

Summary

The case study examines innovations implemented by the Asociación de Caficultores de Taipiplaya (ASOCAFÉ – the Coffee Growers Association of Taipiplaya) in Bolivia, with the aim of promoting the adoption of agroforestry systems that foster climate-resilient landscapes and better living conditions for its members.

ASOCAFÉ seeks to improve the production and export of coffee from Taipiplaya, a region characterised by its biodiversity, mountains and cloud forests. Here, smallholder producers, many of them Aymara migrants from the Andean regions, are located in the Caranavi province of the department of La Paz in the Yungas region of Bolivia. The region is known as the coffee capital of Bolivia as the Yungas ecosystem has a warm-temperate climate, with temperatures ranging between 17° and 26° degrees Celsius, depending on the time of year. The altitude of the area varies between 1,000 and 1,700 metres above sea level.

ASOCAFÉ was founded in 1990 and currently has 199 members from 34 communities and four agricultural centres. ASOCAFÉ's mission is to improve the living conditions of coffee-growing families, facilitating economic development through cooperative action equity and access to national and international markets with a high-quality organic product.

ASOCAFÉ members implement an agroforestry system that is aligned with the shade cash crop model. They grow mainly coffee for commercial sale, but also produce subsistence products for family consumption. Members' properties have an average size of 10 hectares, with 2.5 hectares or more per farm dedicated to coffee plantation. Currently, ASOCAFÉ has 239 hectares of coffee under an organic-certified agroforestry system.

The agroforestry system is characterised by a stratification of plant components into different levels. The upper canopy includes timber trees such as cedar (*Cedrela odorata*), toco (*Enterolobium contortisiliquum*), mara (*Swietenia macrophylla*) and more occasionally verdolago (*Portulaca oleracea*) and paquio (*Hymenaea courbaril*); the middle canopy includes timber trees such as siquili (*Inga edulis*), avocado (*Persea americana*) and some mandarin (*Citrus sinensis*); the lower canopy includes shade-tolerant crops such as coffee (*Coffea arabica*). Crops for subsistence consumption are also found, such as banana (*Musa paradisiaca*), beans (*Phaseolus vulgaris*), cassava (*Manihot esculenta*) and many others. This case study focuses on the commercial portion of the agroforestry, rather than the potentially more diverse subsistence system.

Currently, ASOCAFÉ has a direct beneficiary grant from the Forest and Farm Facility (FFF) for the enrichment of its coffee plantations with the provision of forest species and/or leguminous plants for 148 hectares of coffee plantations in production. Despite progress, challenges remain, such as the management of coffee diseases, low soil fertility, high labour demand, price instability and potential future compliance with the European Union Deforestation Regulation (EUDR). To overcome these obstacles, ASOCAFÉ is investing in training, adopting new technologies and ensuring access to the most promising markets. The organisation also has future strategies that include improving harvest and post-harvest processes, modernising the drying process, enriching coffee plantations with leguminous and forest species, increasing exports, positioning its brand, including more women and youth, establishing a coffee roastery, and seeking financing for expansion.

The main findings highlight that ASOCAFÉ has been instrumental in promoting diversified agroforestry systems, providing training, technical assistance and access to improved seeds. Crop diversification has enabled producers to earn additional income and improve their food security. The agroforestry system has also contributed to improving soil health, increasing biodiversity and addressing climate change. The study recommends implementing government policies to support agroforestry, strengthening technical assistance, ensuring access to fair markets, and promoting research and innovation.

1. Introduction to ASOCAFÉ

1.1 Name and vision

The producer organisation described in this case study is the Asociación de Caficultores de Taipiplaya (ASOCAFÉ – the Coffee Growers Association of Taipiplaya). Its vision is “to be a solid association, a leader in ecological (organic) coffee growing, with integrated management and close coordination with its social base”. It also seeks to “represent and defend the interests of its members with equity, promoting opportunities for socioeconomic development and food sovereignty”.

ASOCAFÉ was created with the main objective of contributing to the increase in family yields and export volumes through the implementation of practices that improve and diversify coffee production systems. It sought to maintain a balance between environmental preservation and economic sustainability. It was also created to improve and expand its coffee collection capacity in order to increase the organisation’s sales volume and resultant economic and financial capacity.

1.2 Foundation

ASOCAFÉ was founded on 19 November 1990, initially comprised of two federations. It currently has 199 members, including men, women and youth from 34 communities and four agricultural centres. The history of ASOCAFÉ reflects the evolution of many organisations in coffee production, marked by milestones of struggle, innovation and solutions developed through community commitment. At its foundation, ASOCAFÉ members faced geographic isolation, lack of access to international markets and low-tech agricultural practices. From the beginning, the organisation prioritised equity and food sovereignty. It worked with small producers who both farmed for food and who cultivated coffee at altitudes of between 800 and 1,850 metres above sea level, taking advantage of the region’s microclimates.

ASOCAFÉ was originally formed of two federations of local coffee growers: the Taipiplaya Federation (Central Taipiplaya, Central Litoral, Central Antofagasta) and the Cruz Playa Federation (Central Cruz Playa, Central Nuevos Horizontes, Central Turístico Entre Ríos). In the 1990s, ASOCAFÉ joined La Federación de Caficultores Exportadores de Bolivia (FECAFEB – the Federation of Bolivian Coffee Growers and Exporters), a network of 30 cooperatives, which strengthened its access to training in organic farming techniques, quality control and international marketing. In addition, ASOCAFÉ adopted Fairtrade principles and obtained organic certification, positioning its coffees in demanding markets such as Japan, the USA and Europe.

In the early 2000s, ASOCAFÉ’s coffee transportation depended on traversing a dangerous road known as the Highway of Death: a 61km stretch of narrow and deep road, which increased costs and limited access to markets, but later a new asphalted road was built and is still in operation today. ASOCAFÉ’s current success is based on a history of resilience and collective work. Since its foundation, and with associated cooperatives, it has transformed Bolivian coffee growing, combining tradition, innovation and social justice, and positioning Caranavi as a world reference region for high-quality coffee.

1.3 Location

ASOCAFÉ is geographically located in Taipiplaya (see Figure 1), a canton in the province of Caranavi, in the department of La Paz in the Yungas region of Bolivia. The region is known as the coffee capital of Bolivia. The region where ASOCAFÉ is located has a warm-temperate climate, with temperatures ranging between 17° and 26° degrees Celsius, depending on the time of year. The altitude of the area varies between 800 and 1,850 metres above sea level. In terms of vegetation, the area is mainly a coffee-production centre. However, families also grow other products such as citrus fruits, bananas, cassava, achiote and other agricultural products. The area also has residual areas of humid subtropical or humid montane forest. Due to the climate and altitude conditions described, the area is highly suitable for the cultivation of coffee and other agricultural products mentioned above.

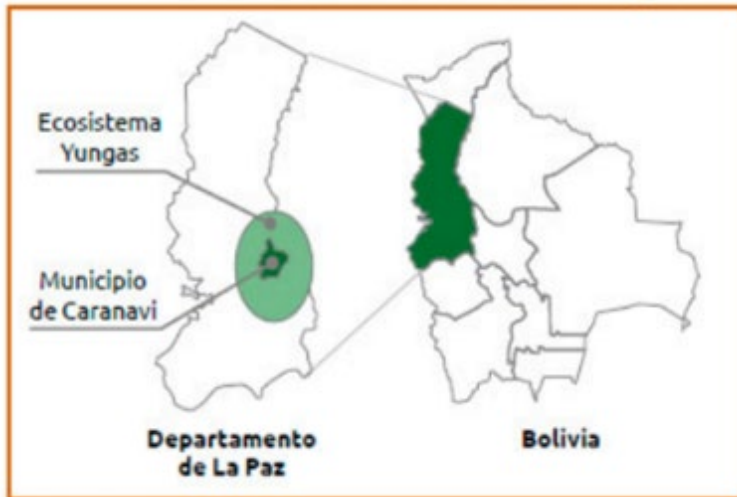


Figure 1. Location of the ASOCAFÉ case-study site in Bolivia

In addition to its location in Taipiplaya, ASOCAFÉ has a dry coffee-processing plant in the city of El Alto, more than 3,600 metres above sea level. It is from this plant that containers of ASOCAFÉ coffee products are shipped to its various clients in the international market (see Figure 2).



Figure 2. ASOCAFÉ coffee products and Madre Selva coffee brand packaging © ASOCAFÉ

1.4 Membership

ASOCAFÉ currently has 199 members (121 men, 78 women) of whom 76 are classified as youth (48 men and 28 women). They all participate in the production process, from the preparation of the seedlings to the shipment of the coffee harvest to the association's processing plant.

ASOCAFÉ members' properties have an average size of 10 hectares, although this can vary. Within these properties, the average area of coffee trees in production is 2.5 hectares, but some members have up to 5 hectares of coffee in production. ASOCAFÉ members have been growing coffee for more than 30 years and a member's family usually consists of five people (father, mother and three children). All members of the family belong to a central community and play an economic and social role.

ASOCAFÉ was established primarily around the production, processing and marketing of coffee, as well as the provision of services to its members. ASOCAFÉ's main products and services are:

- **Coffee production:** ASOCAFÉ brings together small coffee producers who grow coffee on their plots of land. The most common variety is red catuaí, although they also produce caturra, typica and castillo, among others.
- **Coffee collection:** The organisation buys certified organic coffee from its members at the wet processing mill in Taipiplaya during the months of May to September.
- **Wet and dry processing:** The organisation carries out the centralised process of pulping, washing, fermenting and drying coffee. Wet processing is carried out in Taipiplaya, and dry processing is carried out in the city of El Alto de La Paz. The coffee is then threshed and manually sorted to obtain export-quality coffee.
- **Marketing and export:** ASOCAFÉ exports coffee to international markets, complying with sales agreements and contracts. Exports take place from August to December, and payment to producers is made approximately 50 days after the coffee is shipped.
- **Organic certification services:** ASOCAFÉ implements coffee traceability through organic certification. This includes training in organic production and internal inspections to ensure compliance with organic production standards.
- **Roasting and grinding service:** ASOCAFÉ offers coffee roasting and grinding services to its members.

In addition to these core products and services, ASOCAFÉ is also involved in the promotion and implementation of agroforestry systems (AFS) and the search for funding to support its partners in sustainable coffee production.

ASOCAFÉ members grow cash crops (mainly coffee) for external sale: approximately 70–80% of members focus on coffee production for sale, alongside subsistence crops for domestic consumption, but these are generally a secondary activity compared to coffee production. Crops such as cassava, bananas and other agricultural products are produced by families, but it is not possible to establish the proportions of land dedicated to these crops compared to coffee. Approximately 20-30% of farmland is dedicated to subsistence crops such as beans and other products for household consumption such as bananas. This figure varies depending on the specific situation of each partner and the availability of land.

2. ASOCAFÉ’s agroforestry system

2.1 Type of agroforestry

The main type of agroforestry that is being established is aligned with producing cash crops under shade, mainly focused on coffee cultivation. There are now 239 hectares of coffee under agroforestry with organic certification among ASOCAFÉ members. ASOCAFÉ is currently managing a direct beneficiary grant from the Forest and Farm Facility (FFF) for the enrichment of coffee plantations with leguminous and other forest species over a total of 148 hectares. This is to help to build resilience to climate change. The system is characterised by the integration of shade trees in coffee plantations, seeking a balance between production and sustainability. The partners have adopted agroforestry practices both through their own initiative or through the influence and support of ASOCAFÉ.

The members of the association have experimented with different tree species to find those best suited to their plots and coffee cultivation. The use of economically valuable forestry and leguminous species is preferred. The choice of species is based on their ability to provide shade, improve the soil, and generate additional products for household consumption and/or sale.

2.2 Main species

The key concerns in using different species in each component or stratum of a coffee agroforestry system lies in the creation of a sustainable but also productive ecosystem. The appropriate selection of species for each stratum is fundamental to optimise the benefits of the agroforestry system, such as improved coffee quality, reduced negative environmental impacts, and diversified income for producers. Figure 3 shows a black and white hand-drawn diagram by Juan Quispe Luna from the community Tres Estrellas of ASOCAFÉ, illustrating the different strata in the structure of the agroforestry system and components in cross-section.

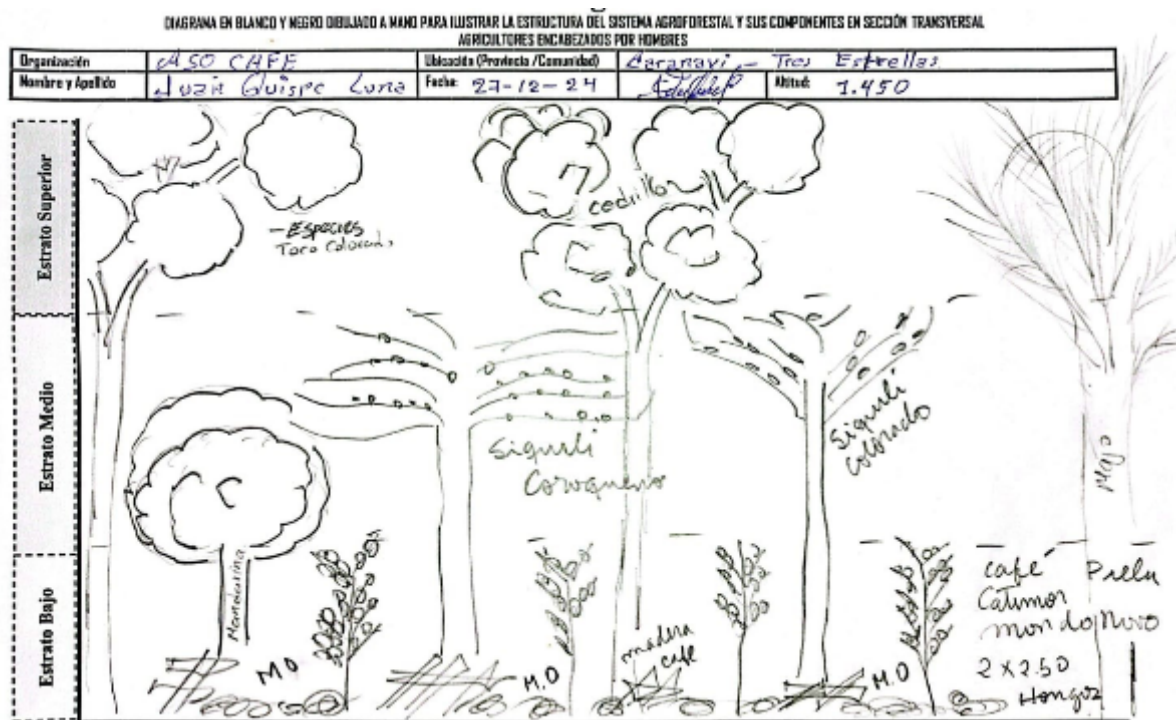


Figure 3. Diagram of coffee agroforestry system by Juan Quispe Luna



Figure 4. Typical canopy structure of a mature coffee agroforestry system © ASOCAFÉ

Figure 4 shows a typical agroforestry system within which the main species under each component (upper, middle and lower strata) of the agroforestry system:

Upper-canopy timber trees: This stratum plays a crucial role in the agroforestry system due to its height and ability to intercept sunlight. These trees, by occupying the upper level, create a canopy that regulates the amount of light reaching the lower strata, while also providing protection from wind, which in turn influences the growth and development of the coffee and other species or crops below. The species found in this stratum are detailed below:

- Cedar (*Cedrela odorata*): This tree is consistently found in the upper stratum and reaches a great height.
- Toco (*Enterolobium contortisiliquum*): Also located in the upper stratum, varieties such as toco blanco and toco colorado are mentioned.
- Mara (*Swietenia macrophylla*): Appears in both the upper and middle strata for its growth, suggesting variability in height.
- Verdolago (*Portulaca oleracea*) and paquio (*Hymenaea courbaril*): These are found in the upper stratum, but in lower frequency than the other forest species mentioned above.

Middle-canopy timber and fruit trees: This stratum acts as a link between the upper and lower strata. These species, being located in an intermediate position, contribute to the structural diversification of the system, generating multiple ecological niches. Mainly, these species contribute to soil fertility through the litter they generate, while also playing an important role in water conservation and soil protection against erosion. The species found in this stratum include:

- Siquili (*Inga edulis*): Consistently found in the middle stratum, including variations such as siquili coroqueño, siquili colorado and siquili nativo o cola de mono.
- Avocado (*Persea americana*): This species appears in the middle stratum and its function is both economic (for commercial sale) and for household consumption.
- Mandarin (*Citrus sinensis*): This species appears in the middle stratum. Its function is also both economic and for household consumption.

Shade-tolerant crops: These are mainly agricultural crops that generate economic benefits and are fundamental for the productivity and sustainability of the agroforestry system. This lower stratum focuses mainly on coffee and some other agricultural crops, although occasionally small trees or shrubs are observed. The species found in this stratum include:

- Coffee (*Coffea arabica*): Different varieties grown include café catura, catuai rojo, castilla, pacamara, geisha and mondo novo.

Subsistence crops: These are mainly agricultural crops that generate economic benefits and are fundamental for the productivity and sustainability of the agroforestry system. Beans (*Phaseolus vulgaris*), maize (*Zea mays*), bananas (*Musa paradisiaca*) and cassava (*Manihot esculenta*) appear in the lower stratum and within the agroforestry system. Their function is mainly for household consumption, although beans also enable nitrogen fixation.

Based on the surveys conducted and visits to the plots, the diversified coffee agroforestry system of ASOCAFÉ is a common model (see Figure 5 below), considering the different tree and shrub species found in the upper, middle and lower strata, which provide a complex and diverse shade. The system not only promotes greater biodiversity and ecological functionality than a monoculture coffee crop, but also improves carbon sequestration and microclimate regulation. It is widely considered more sustainable in the medium and long term as it combines coffee production with the provision of multiple ecosystem services.

Across agroforestry systems, a number of main structural components can be identified. These structural components can be made up of many different species, depending on the geographical and ecological context. For organisations such as ASOCAFÉ, relying on monoculture crops that cater to single markets is apparently no longer a safe strategy. However, this is not to say that diverse agroforestry systems are without their own challenges. Climate change itself may erode the benefits of agroforestry, for example by increasing competition for water.

In the agroecological arena, organisations have developed sophisticated tactics to promote agrobiodiversity, such as marketing nutritional, health and cultural values, sharing knowledge and seeds to cultivate diversity, aggregating baskets of quality products from the same landscape, mobilising domestic funding to invest in experimental diversification, and formulating enabling policies for the above (Macqueen 2024). Agroforestry systems play a central role in such strategies.

With these considerations, the Macqueen stratification methodology was applied to the ASOCAFÉ case study, which belongs to the agroforestry type 'shade-grown cash crops'. The key structural components of the agroforestry system design were identified and are described in Figure 5 and Table 1. The combination of forest trees, fruit trees and crops grown in an integrated manner on the same plot seeks to maximise production and environmental benefits.

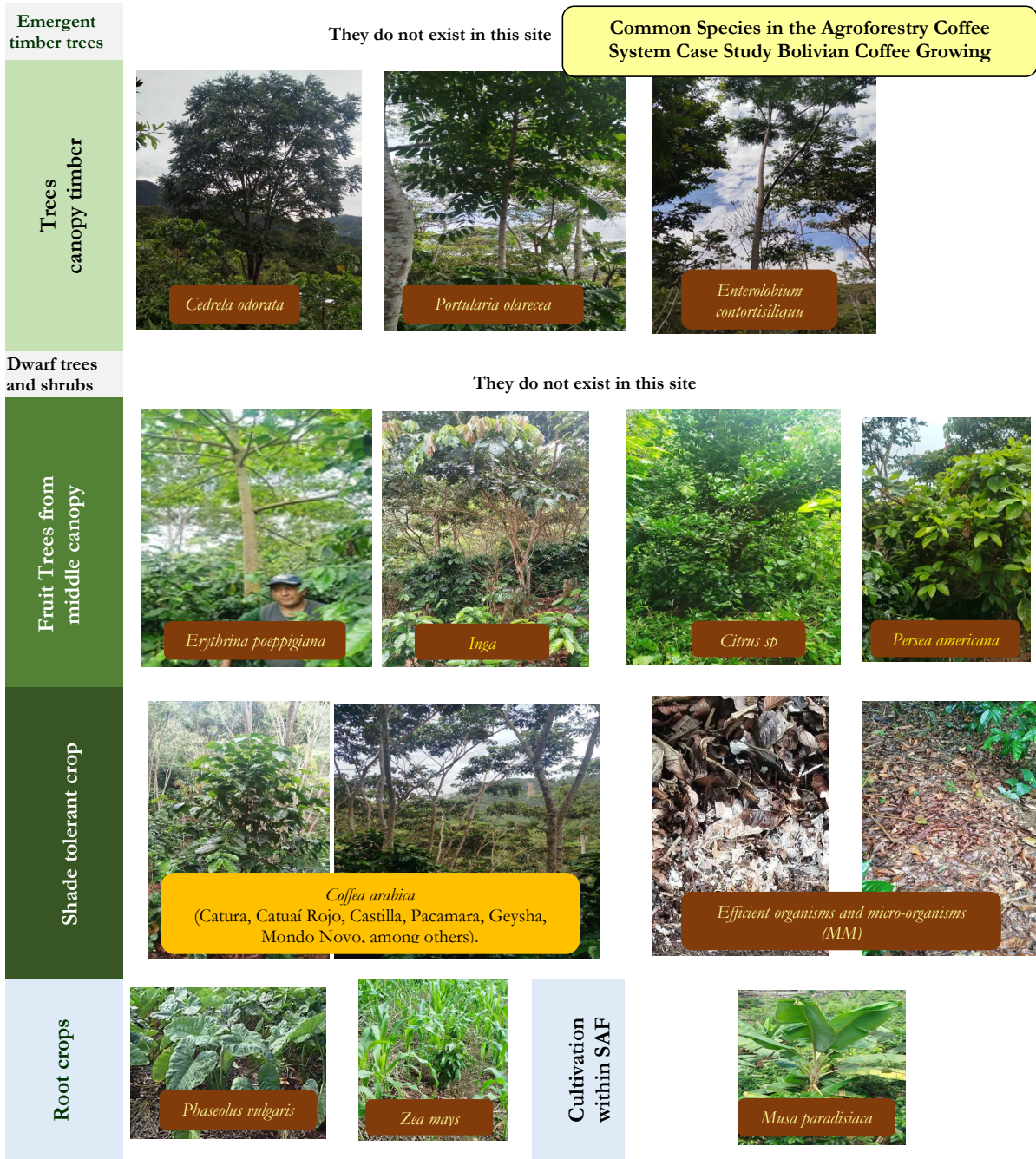


Figure 5. Common design of the shade coffee agroforestry system © ASOCAFÉ

Table 1. ASOCAFÉ's agroforestry system components and strata

Strata	Features
Emergent timber trees	Not present in this system although cedro/cedar (<i>Cedrela odorata</i>) and toco (<i>Enterolobium contortisiliquum</i>) can reach significant heights.
Upper-canopy timber trees	This stratum includes large and tall trees, such as cedro, toco and mahogany/mara (<i>Swietenia macrophylla</i>). Verdolago (<i>Portulaca oleracea</i>) and paquio (<i>Hymenaea courbaril</i>) are also found, although less frequently. These trees provide shade for coffee cultivation and may also have other uses.
Medium-canopy timber trees	In this stratum, smaller trees can be included, such as siquili (<i>Inga edulis</i>) with variations such as siquili coroqueño, siquili colorado and siquili nativo or cola de mono. Palta or avocado (<i>Persea americana</i>) is also grown. These trees provide additional shade and help to improve soil fertility. In this stratum, citrus (<i>Citrus sp</i>) can also be considered for subsistence use although these could also be put in the category of dwarf trees and shrubs.
Dwarf trees and shrubs	Bananas (<i>Musa paradisiaca</i>) can also be integrated into the system for subsistence use.
Shade-tolerant crops	This stratum is where the main cultivation of coffee is located: <i>Coffea arabica</i> , with varieties such as café catura, catuaí rojo, amoro, catimor and castilla.
Basic crops	Other crops such as beans (<i>Phaseolus vulgaris</i>) and corn (<i>Zea mays</i>) bring diversity to the system and can generate additional income, as well as improve soil fertility.
Root crops	Cassava (<i>Manihot esculenta</i>) is found in some subsistence systems.

2.3 Other farming activities

ASOCAFÉ members also grow crops for their own household consumption, such as corn, beans, cassava and bananas, although in smaller proportions compared to coffee. Some members grow other fruit and citrus crops, such as avocado and mandarin, but these are also usually integrated into the agroforestry system.

It is important to note that agroforestry systems integrate the use of trees and other crops within coffee plantations. This makes it difficult to clearly differentiate between one use and the other, because agroforestry plots often include cash and subsistence crops. Although exact figures do not exist, the majority of ASOCAFÉ members' land is used within the agroforestry system, where coffee cultivation occupies a central place, while a smaller portion is used for other uses such as subsistence crops and fruit trees.

2.4 Scale

The agroforestry areas managed by the 199 members of ASOCAFÉ vary, but there are some data that allow an approximation of their extension, which covers 239 hectares of coffee under an organic-certified agroforestry system, with the following characteristics:

- **Size of properties:** ASOCAFÉ members have plots of land of approximately 10 hectares.
- **Area dedicated to coffee:** The average coffee plantation in production is 2.5 hectares. This is the main crop within the agroforestry system, so the majority of each partner's agroforestry area is focused on this crop. Some partners have up to 5 hectares dedicated to coffee.
- **Agroforestry system:** The partners implement agroforestry systems, combining coffee cultivation with timber, fruit and other species.
- **Basic crops and root crops and within the agroforestry system:** Although the exact extent of these crops within the agroforestry is not detailed, it is known that in addition to coffee, other

products such as citrus, bananas and cassava are grown for consumption and food security of the families.

Most of the land is privately owned, where each member has a title deed issued by the Instituto Nacional De Reforma Agraria (INRA – National Institute of Agrarian Reform).

The families of the members are involved in the production process. This implies that land-management and agroforestry activities are carried out at the family level, which reinforces the idea of individual or family land tenure. Members belong to a community and farm centre, although ownership may be private, there is a community and organisational structure that influences farming decisions and practices. The organisation into communities and farm centres suggests that there may be aspects of communal ownership or shared use of resources, although individual land ownership appears to be the norm.

3. Motivation to establish agroforestry

3.1 Origin and promotion of agroforestry

According to the research surveys and visits to farms and plots farmed by ASOCAFÉ members, the agroforestry system in use has been promoted by various entities. There have been different processes of technical assistance, exchanges of experiences, and conversations with neighbours and technical specialists. Despite this, ASOCAFÉ's engineers and technicians have played a crucial role in promoting the agroforestry system. They have explained to members how to plant and how to manage weeds within this system. They have introduced the agroforestry system, offering training courses (CATIE, 2024) through projects and programmes such as the Latin American and Caribbean Network of Fair Trade Small Producers and Workers (CLAC), guiding the partners in the implementation and promoting the benefits of agroforestry systems. ASOCAFÉ has also sought funding from public and private institutions to support its members, including projects that strengthen agroforestry systems, such as the FFF programme. Although ASOCAFÉ technicians have guided member producers on the agroforestry system, not all of them followed strictly their recommendations.

One example of an additional project and organisation that has also contributed to the dissemination of the agroforestry system is that of the Ministry of Rural Development and Land's National Coffee Investment Programme. The project has also provided coffee seedlings mainly of the cuatai rojo and castilla varieties.

The promotion process carried out by ASOCAFÉ has involved workshops and training courses where the benefits of the agroforestry system are explained, covering topics such as proper planting, weed management and coffee varieties. Some plots have been set up to serve as demonstration plots, where members and other producers can directly observe the benefits of the agroforestry system. The members also engage in learning by doing, such as implementing the anoxic water pillow technique (see www.rawmaterial.coffee/news-insights/the-anoxic-water-pillow-technique) for renewing coffee plantations.

The promotion of the agroforestry system within ASOCAFÉ is a process that has involved multiple actors and strategies. Engineers, technicians and external organisations have provided training and technical assistance, while personal experience and direct observation has played a crucial role in the adoption of the system by ASOCAFÉ members. Some of the perceived benefits of the agroforestry system that motivate adoption are described below.

3.2 Nutritional benefits

ASOCAFÉ's members benefit from a greater diversity of food and useful household products thanks to the implementation of agroforestry systems. In addition to coffee, they grow fruit trees, vegetables and other crops that improve their diets and incomes. Some members grow avocado, bananas, and various citrus fruits such as mandarins and oranges, while cassava is another crop mentioned as being produced by the families for their own consumption.

The agroforestry system also brings indirect benefits such as the generation of natural fertiliser and improved soil conditions. While there is no clear distinction between men and women, these benefits are shared by all members of the family.

3.3 Economic benefits

ASOCAFÉ members benefit from crop diversification which allows them to sell other products in addition to coffee and generate additional income. The sale of fruit and other products complements their income and is sold to local and regional markets, although coffee remains the main economic driver. The ability to sell to different markets, both through ASOCAFÉ and to intermediaries, offers them flexibility and opportunities to increase their income. The adoption of new production practices, such as the renovation of coffee plantations and the use of new coffee varieties, also contributes to improving the productivity and profitability of their crops.

ASOCAFÉ has the capacity to export coffee to international markets, which can generate better income for members, although this process can take time. Despite diversification, coffee remains the main product and

source of income. Some members also sell their products to intermediaries, who sometimes offer better cash prices.

The women members of ASOCAFÉ perceive the sale of products as an important source of income. Although coffee remains the main crop, crop diversification allows them to earn additional income through the sale of other products such as fruit. Women are actively involved in production and commercial processes and are looking for ways to improve their income by participating in new initiatives and improving production. Finally, women have a positive perception of the potential of agroforestry systems to generate income for themselves and their families.

ASOCAFÉ's male members perceive the sale of produce, mainly coffee, as a crucial source of income for their families. While coffee is their main focus, crop diversification is also seen by them as an important strategy to supplement their income. The men are also active in production and commercial processes and are willing to adopt new practices and technologies to improve the production and profitability of their crops. Although they face challenges, they are motivated by the possibility of generating higher incomes and improving their livelihoods through agroforestry.

3.4 Ecological benefits

ASOCAFÉ farmers, both men and women, perceive multiple benefits in the overall productivity and health of their farming systems by implementing agroforestry practices.

In terms of green manure or mulch production, farmers note that the presence of trees and other species in their agroforestry systems greatly contributes to the generation of organic matter. Tree litter decomposes, enriching the soil with nutrients, and organic matter helps retain soil moisture, which is crucial for agriculture in areas where rainfall is not constant.

Agroforestry systems also contribute to erosion control. Planting on contour lines is promoted to help prevent soil loss. Trees and other species act as physical barriers, reducing the impact of rainfall and water runoff. Water management is also improved, with agroforestry systems facilitating water infiltration into the soil, increasing its availability to plants and decreasing the risk of surface runoff.

In terms of wind protection, the timber trees in the upper stratum act as barriers that protect the crops from damage. This protection helps to maintain soil moisture and reduce evaporation, which is beneficial for crop growth.

Regarding the overall health of the farming system, agroforestry promotes biodiversity by attracting pollinators and other beneficial organisms. The shade provided by the trees helps regulate soil temperature, which is beneficial for microorganisms that are essential for soil fertility. The partners note that in areas where there is no organic matter, coffee does not grow well. They also mention that, with more shade, coffee ripens evenly and has a better yield. In general, partners perceive an improvement in the overall productivity of their plots by adopting agroforestry. They recognise that their plots have more organic matter and that this is beneficial for soil health.

The perception of ASOCAFÉ women is that agroforestry systems are preferable to monocultures, as they result in higher production and improved health of their plots and they note that with more shade, the coffee ripens evenly and has better production. The perception of the men is that the shade from the trees helps to regulate the soil temperature, which is beneficial for the overall health of the agroforestry system and the development of the coffee. They also consider agroforestry systems preferable to monocultures, as they result in higher production and improved health of their plots.

3.5 Social benefits

The social and cultural benefits of agroforestry systems are considered in terms of inclusion of women, youth or marginalised groups in the production system:

- **Community participation:** In general, in ASOCAFÉ communities, the issue of coffee has become less important in community meetings, where other issues such as coca are discussed. However, some producers' plots serve as visible demonstrations of the benefits of agroforestry systems, which generates interest and questions, especially from men and youth. This indicates that even if coffee is

not the main topic in the meetings, demonstration plots can have a visual impact and generate interest in the community.

- **Inclusion of women:** ASOCAFÉ aims to include more women in coffee production. The association is considering adjusting its statute to incorporate more women members, recognising the importance of women's participation in the sector, which is significant in the Taipiplaya region. ASOCAFÉ plans to implement a coffee roastery with the participation of the women's committee, which aims to promote women's economic activity.
- **Inclusion of young people:** Similar to women, young people are also a target group for inclusion in ASOCAFÉ. The association actively seeks to increase the number of young producers among its members. This reflects the recognition of the need to involve new generations in coffee production and ensure long-term sustainability.

3.6 Disadvantages

The disadvantages of agroforestry systems in coffee production for ASOCAFÉ and its members include the complexity of management that requires greater knowledge and skill, as well as a greater need for labour, especially for weeding. Difficulty in the initial establishment of the system is also mentioned, such as slashing vegetation to clear an area but without burning it. Although agroforestry systems promote organic matter, careful management is required to ensure that it is maintained and that nutrients in the soil are not depleted.

4. Design and installation of the agroforestry system

4.1 Guidance on agroforestry installation

Within ASOCAFÉ, training in agroforestry design was provided by technicians and also through practical experience and observation of other producers. Practical experience and adaptation to local conditions played a key role in the adoption of agroforestry systems by ASOCAFÉ members.

4.2 Seed sources

ASOCAFÉ partners obtain seeds and advice for planting the different components of their agroforestry system from their members and other projects such as:

- **Members farms:** Initial seeds to implement the agroforestry system are obtained from their own plots or farms and forestry, and fruit seeds are collected from their own farms.
- **Neighbour exchange:** In some cases, producers share or exchange seeds for subsistence crops such as cassava and plantain.
- **Projects:** Some seed is obtained from projects such as CLAC or the National Coffee Programme.
- **Selected mother plants:** Over time, the producers have also identified and then obtained seeds from their own mother plants, selecting the best coffees from their plots, from plants between 10 and 15 years old. This allows them to ensure the adaptation of the seeds to their local conditions and to improve the quality of their crops.

In summary, the procurement of seeds and advice for agroforestry systems is a multifaceted process that involves both external organisations and ASOCAFÉ's own members. The association plays a central role in coordinating training, facilitating access to resources and promoting innovative practices.

4.3 Management issues

The main challenges of managing the agroforestry system and how ASOCAFÉ has helped farmers to overcome them are summarised below:

- **Challenges in agroforestry management:** Farmers face several challenges in managing their agroforestry system, including the complexity of the system and the high labour demand for its maintenance. Tasks such as land clearing, seedling acquisition/cultivation, weeding and general maintenance of the system increase the costs and labour required. In addition, diseases and pests pose a constant threat, with rust and rooster's eye being the most damaging. Weed proliferation also creates difficulties, increasing maintenance costs. Initial establishment of the system, especially planting without burning the vegetation, has proven to be an additional challenge. Finally, market fluctuations and sales prices represent economic challenges for producers and also for ASOCAFÉ.
- **ASOCAFÉ's solutions to these challenges:** The organisation plays a crucial role in providing technical training through workshops and meetings, where the benefits of agroforestry and best practices for their implementation are explained. ASOCAFÉ technicians provide guidance on the design of agroforestry components, seed selection and pruning techniques. ASOCAFÉ helps producers to organise themselves for coffee production and marketing, connecting them to national and international markets. The association also considers in its new statute the possibility of incorporating aspects related to the management of the agroforestry system.

Organisation and management are based on coordination of activities, constant communication and adaptation to local needs, enabling producers to successfully adopt and maintain agroforestry systems.

5. Aggregation and sale of agroforestry products

5.1 Markets for products

The main end markets for ASOCAFÉ members' agroforestry products include local, national and international markets. Table 2 is a summary of these markets, detailing the buyers.

Table 2. Main markets for ASOCAFÉ members

Market	Description	Products	Buyers/customers
Local markets	Producers sell some of their products directly in their communities or in nearby markets. Some use the products for their own consumption.	Coffee, fruits such as avocado, citrus, bananas, cassava, achiote and other agricultural products.	Local communities, nearby markets, direct consumers.
National market	ASOCAFÉ seeks to position its coffee brand Madre Selva in the national market.	Roasted and ground coffee and other agricultural products.	General population (for its Madre Selva brand), local intermediaries.
Export market	ASOCAFÉ exports coffee to international markets and has sales contracts with buyers in different countries. Producers must wait for the export processing time to receive payment.	Green coffee.	Germany, Japan and the USA.

ASOCAFÉ is the main marketing channel and ASOCAFÉ strives to offer fair prices to its members. Most producers deliver a significant part of their production to ASOCAFÉ, which is in charge of marketing and export. Some producers mention that they deliver 50% or more of their coffee to ASOCAFÉ. Some producers also sell to intermediaries because they offer immediate payment and higher prices at certain times. However, this option may imply a lower profit in the long run, as ASOCAFÉ offers export prices, albeit with a waiting time for payment.

Selling prices vary depending on the market and the buyer. Some producers mention that they have received between US\$5.80 and US\$7.70 (40–53 bolivianos) per can of coffee. Prices may vary per year and according to the quality of the product. International Customers have also been procured by ASOCAFÉ which has established business relationships with customers in Germany, Japan and the USA, as detailed in Table 3.

Table 3. International buyers of ASOCAFÉ products

Buyer and location	Product sold	Length of relationship
Ana Katerin, Germany	Green gold coffee (speciality coffee microlots)	4 years
Awataru, Japan	Green gold coffee (speciality coffee microlots)	10 years
GrainPro Limited, USA	Green coffee gold (organic)	4 years

Product diversification is an important consideration. ASOCAFÉ producers not only sell coffee, but through their own means also market other products such as fruits (avocado, mandarin, orange) and cassava which diversifies their income. The members grow these other products and sell them in local markets or to intermediaries. ASOCAFÉ does not actively participate in the commercialisation of these products in the

same way as it does with coffee, because it would need to have its own market and capital for the collection and commercialisation.

ASOCAFÉ faces economic challenges in exporting all the coffee produced by its members. As a result, many producers deliver only part of their production to the organisation. It plans to position its coffee brand Madre Selva on the national market and plans to implement a coffee roaster with the participation of the women's committee. The organisation also plans to export at least six containers of coffee to international markets in the coming years. Some producers want ASOCAFÉ to improve the prices it pays for coffee to avoid selling to intermediaries.

5.2 Changes over time

Over time, coffee production and marketing in ASOCAFÉ has undergone remarkable changes. Initially, coffee was the main product and, in many cases, the only crop marketed by producers. In the early stages, producers mainly cultivated traditional varieties such as criolla and caturra. Later, new varieties such as catuaí rojo, castillo, amboro and others were introduced. Over time, the coffee production has been integrated into a more diverse system, where trees are combined.

ASOCAFÉ has played a key role in the evolution of coffee production and sales by encouraging the adoption of agroforestry and improving wet and dry growing and processing practices. However, challenges also remain, such as competition with intermediaries and the need to improve the prices offered to producers.

Although coffee is still the main product, what is sold has changed from being only coffee of traditional varieties, to coffee of improved varieties that is packaged for diverse markets, combined with other products such as avocado and citrus.

ASOCAFÉ has played a pivotal role in fostering and changing commercial production through the value addition and processing it leads, although this role has evolved over time. Initially, the organisation focused on the production and commercialisation of green coffee and now also markets roasted and ground coffee under its Madre Selva brand. It has facilitated the collection, processing, marketing and export. While the organisation has managed to consolidate its role in coffee marketing, there are areas for improvement, such as incorporating other aggregation products and improving the prices offered to producers, to strengthen its role in fostering the economic development of its members.

Over time, the impact of agroforestry adoption and crop diversification has generated diverse impacts on the functioning of ASOCAFÉ's agroforestry system. These changes have transformed agricultural practices and have influenced the production, sustainability and socioeconomic dynamics of the associated communities.

- **Improved soil health:** The integration of timber trees such as cedar, toco and mara, along with species such as siquili, avocado and banana, has contributed significantly to soil health. The presence of organic matter improves soil structure, reduces erosion and increases water retention.
- **Increased biodiversity:** The implementation of the agroforestry system has fostered a greater diversity of plant species on farmers' plots. In addition to coffee, citrus, avocado, bananas, cassava, and other species are now grown, creating a more resilient and balanced system.
- **Increased coffee production:** The adoption of new coffee varieties, together with practices such as the use of the anoxic water pillow technique and contour planting, has contributed to increased coffee production.
- **Green manure production:** The presence of siquili and other species in the agroforestry system contributes to the production of green manure. The leaves and branches of these trees, as they decompose, contribute nutrients to the soil, reducing the need for chemical fertilisers.
- **Income diversification:** Crop diversification has allowed producers to earn additional income from the sale of other products in addition to coffee, improving their economic security.

5.3 Future plans

ASOCAFÉ's future strategies for developing or changing the agroforestry system, with the aim of improving it and increasing commercial income, are shown in Table 4. ASOCAFÉ is implementing a comprehensive strategic plan to strengthen coffee production and marketing in the Taipiplaya region. It has a clear vision for the future, with strategies that seek to improve both the production and marketing of coffee and other agroforestry system products. These strategies are based on diversification, innovation, inclusion and sustainability, which will enable the organisation and its members to face the challenges of the future and ensure a better standard of living.

Table 4. Future plans of ASOCAFÉ's membership

Strategy	Timeframe	Description
Improving the coffee harvesting and post-harvesting process	Short term	Implement appropriate technologies and tools to improve coffee quality. This includes practices that ensure selective harvesting of ripe beans, proper pulping and fermenting, and efficient drying for higher-quality and higher-value coffee. The use of appropriate technologies can reduce losses and improve the presentation of the final product, which in turn can translate into better prices in the market.
Modernising the drying process with hybrid solar dryer	Short term	Install a hybrid solar dryer at the Taipiplaya wet processing plant to improve the quality of the harvested coffee. This innovation will allow for more uniform and efficient drying, reducing dependence on weather conditions and minimising the risk of damage to the beans, which directly impacts the quality of the final product.
Rearranging coffee plantations with leguminous and forest species	Medium term	Rearrange 148 hectares of coffee in production, incorporating leguminous and forest species to mitigate the effects of climate change. This strategy seeks to establish a more diversified and resilient agroforestry system. The presence of legumes will help fix nitrogen in the soil, while forest trees will provide shade, protection against erosion and an additional source of income. It will also improve the fertility and overall health of the system.
Achieve the export of at least six containers of coffee	Medium term	Increase the volume of coffee exports to international markets. This goal involves consolidating existing markets and seeking new buyers, and ensuring the quality of the coffee meets international standards. A higher export volume can improve the income of the organisation and its members.
Position the Madre Selva coffee brand in the national market	Medium term	Promote and establish ASOCAFÉ's coffee brand in the national market. This includes the creation of a marketing and distribution strategy to reach a larger number of consumers in Bolivia, which would allow the organisation to sell its coffee directly to the national market, avoiding intermediaries.
Adjustment and/or updating of ASOCAFÉ's statute	Medium term	Revise and update the organisation's statute to allow for the incorporation of a greater number of members, prioritising women and young producers. This initiative seeks to strengthen ASOCAFÉ's social base, promoting gender equity and the inclusion of young people in the production process. Greater participation can increase the organisation's capacity and its impact on the community.
Implementation of a coffee roastery with	Medium term	Establish a coffee roastery so that ASOCAFÉ's women's committee can sell roasted and ground coffee on the national

the participation of ASOCAFÉ's women's committee		market in the short term and internationally in the medium term. This strategy seeks to empower the women of the organisation, providing them with an additional source of income and added value to the final product. The sale of roasted and ground coffee can generate higher profit margins for the organisation and its members.
Exploring financing for expansion	Long term	Seek external funding to support the expansion of the agroforestry system, including the implementation of nurseries, renovation of coffee plantations and new hectares of coffee plantations, and the implementation of drip-irrigation systems. This could include bank loans or development projects with external organisations, among others. Expanding the area under cultivation and improving wet and dry processing infrastructure can increase production and commercial income.
Strengthening inclusive governance and innovations in harvesting and post-harvesting	Medium/long term	Implement a project to strengthen inclusive governance, innovations in harvesting and post-harvesting, value addition and the reorganisation of coffee plantations with leguminous and forest species, using a gender and generational approach and climate change mitigation. This project seeks to strengthen ASOCAFÉ's management capacity, improve the efficiency of production processes and promote the participation of all members, particularly women and youth.

6. Financing agroforestry plots

6.1 Start-up and running costs

Production costs in an agroforestry system are diverse and can vary significantly between producers. The main expenses are concentrated on labour, which is necessary for tasks such as land preparation, harvesting and crop maintenance. The purchase of seedlings and fertilisers also represents a considerable investment, although the use of natural fertilisers can help to reduce these costs. Other operational expenses, such as irrigation and pest control, complete the picture. The variability in costs is influenced by factors such as plot size, management practices and access to external financing. Efficient management of these costs is essential to ensure the economic sustainability of the agroforestry system.

The main costs involved in the implementation and maintenance of the agroforestry system according to ASOCAFÉ members are detailed in Table 5.

Table 5. Main costs of managing the agroforestry system

Cost	Description
Labour to clear the land	This cost refers to the manual work necessary to prepare the land prior to planting, including the removal of weeds, bushes and other elements that may hinder crop development.
Labour for weeding	Weeding is a recurrent activity carried out to eliminate weeds that compete with crops for nutrients, water and sunlight. According to one farmer, this activity is done three times a year.
Purchase or cultivation of tree seedlings	This cost includes the purchase of seedlings of forest, fruit or leguminous trees, which are used to diversify the agroforestry system. It can also refer to the investment in growing these seedlings from seed in nurseries. Producers have obtained seedlings from projects or from their own coffee plantations.
Payment per can of harvested coffee	Producers hire labour for the coffee harvest and pay per can harvested. One producer mentions that he pays 20 bolivianos per can and that this price is rising. Another producer indicates that he has paid prices between 40 and 53 bolivianos per can.
Labour for pruning	Pruning is an essential practice for the management of trees and crops, ensuring healthy growth and optimal production.
Estimated total costs	One farmer estimated his production costs at US\$2,800–4,300 (20,000–30,000 bolivianos) without having made a detailed calculation. Another producer spent US\$6,200 (43,000 bolivianos) on labour to install new coffee plantations.

It is important to note that these costs can vary according to the scale, conditions of the land, the species used and the management practices of each producer. Most of these costs are borne directly by the producers, as financial support from the ASOCAFÉ cooperative is limited and focuses more on technical assistance and seedlings. Producers mention the need to reduce costs and seek financing options to improve their agroforestry practices.

6.2 External finance

External sources of funds to cover the costs associated with the implementation and maintenance of agroforestry systems are mainly through projects and, to a lesser extent, loans. Funding has been received through projects, such as the CLAC project that has provided seeds and training to producers. In addition, ASOCAFÉ has managed technical and financial support from public and private institutions for its members, including the subsidy fund of the European Union's Programme to Support the Promotion of Growth and Export Diversification (PROEX) of the Ministry of Productive Development and Plural Economy. It currently has funding with cooperation resources from the FFF programme for 148 hectares of coffee plantations.

These projects have been crucial in helping farmers adopt more diverse agroforestry systems by providing seeds, technical expertise and financial support.

6.3 Future plans and financial requirements

ASOCAFÉ is charting an ambitious growth and development path. Its strategy focuses on diversifying its operations, not only by growing coffee but also by processing and marketing it directly. This will allow it to add more value to its product and open up new market opportunities, both nationally and internationally. Table 6 summarises ASOCAFÉ's short, medium and long-term expansion plans that may require further funding.

Table 6. ASOCAFÉ's future plans and their financial implications

Expansion plan	Timeframe	Description	Funding Requirement
Adjustment and/or updating of ASOCAFÉ's statute	Short term	The plan includes the possibility of incorporating a larger number of members, prioritising women and young producers. This may require funding for recruitment and training activities.	Funding for recruitment and training activities
Improve the coffee harvesting and post-harvesting process and centralised wet processing	Short/medium term	Implement the use of appropriate technologies and tools to improve the harvesting and post-harvesting process, as well as optimising the centralised wet processing process. These are key factors in producing high-quality coffee and improving the income of members.	Investment financing for harvesting and post-harvest processes, and wet processing
Implementation of a coffee roastery	Short/medium term	The aim is to establish a coffee roastery with the participation of the ASOCAFÉ women's committee to sell roasted and ground coffee on the national market. This would involve financing for the purchase of equipment and infrastructure and for training.	Investment in equipment, infrastructure and training
Achieve the export of at least six containers of coffee	Short term	ASOCAFÉ seeks to increase its export volume to international markets. This plan requires financing for the collection, processing and transportation of coffee, as well as for the management of organic certification.	Financing for coffee collection, processing and transportation
Positioning the Madre Selva coffee brand	Short/medium term	The aim is to consolidate the Madre Selva coffee brand in the national market. This may require funding for marketing, advertising and distribution activities.	Funding for marketing, advertising and distribution activities
Renovation of coffee plantations	Medium/long term	Individual farmers such as Clotilde Titirico and Juan Quispe plan to renovate their coffee plantations, which may require financial support for the purchase of seedlings and other inputs. Some producers also plan to introduce new coffee	Financing for seedlings and inputs

		varieties such as Geisha and Pacamara.	
Increase in coffee hectares	Medium/long term	Individual producers such as Juan Quispe have plans to increase their coffee hectares, which will require financing for land purchase or rental, soil preparation and planting.	Financing for land purchase/rental, soil preparation and planting
Implementation of drip-irrigation systems	Medium/long term	Individual producers such as Yola Mamani have plans to implement drip-irrigation systems for their plantations, which will require funding for the installation of irrigation systems and the purchase of equipment.	Financing for the installation of drip-irrigation systems
Project for agroforestry systems with forestry and leguminous species	Medium term	ASOCAFÉ has a project for the strengthening of inclusive governance and the reordering of coffee plantations with leguminous and forest species using a gender and generational approach and climate change mitigation. This project was funded by the FFF–FAO project in 2024–2025.	FAO funds from the FFF

To achieve these goals, the organisation recognises the importance of inclusion and participation of all its members, especially women and youth. It also seeks to strengthen its social base and promote gender equality. However, these expansion plans require significant investment. ASOCAFÉ needs funding to improve its infrastructure, purchase equipment, train its members, develop marketing strategies and promote more sustainable agricultural practices. Individual farmers also need financial support to renovate their coffee plantations, adopt new technologies and improve their cultivation practices. ASOCAFÉ is exploring various sources of funding, including strategic alliances with financial institutions and development projects.

7. Conclusions and recommendations

7.1 Key innovations

ASOCAFÉ has been instrumental in the adoption of more diverse agroforestry systems by its members through several key mechanisms. First, the organisation has provided training and technical assistance to farmers, introducing practices such as no-burn checking, fertilisation, weeding, and weeding. ASOCAFÉ has also facilitated access to improved seeds and seedlings and promoted the renovation of coffee plantations with more productive and resistant varieties. In addition, ASOCAFÉ has managed technical and financial support from public and private institutions for its members, which has been fundamental to cover the initial costs of implementing agroforestry systems.

Finally, through the implementation of a wet and dry processing plant, ASOCAFÉ has sought to improve coffee quality and facilitate access to markets, encouraging producers to adopt more sustainable and diversified practices. Table 7 summarises ASOCAFÉ's key innovations to promote the adoption of agroforestry among its members.

Table 7. Summary of ASOCAFÉ's main innovations in promoting agroforestry

Area	Key Innovation Summary
Training and technical assistance	ASOCAFÉ has offered workshops and courses on agroforestry practices (no-burn check, fertilisation, weeding, pruning, efficient microorganisms, water reservoirs) and contour planting design.
Access to seeds and seedlings	ASOCAFÉ has facilitated access to seeds of improved varieties (amboro, castilla) and seedlings from the Bolivian National Coffee Programme and projects such as CLAC, and promoted the use of seeds from the partners' own coffee plantations.
Demonstration of benefits	ASOCAFÉ has demonstrated the advantages of agroforestry through its demonstration plots and other farmers, including increased coffee production at shorter distances and product diversity.
Business options	ASOCAFÉ has implemented a wet and dry processing plant and plans to establish a coffee roastery with women's participation, seeking to increase added value and generate new markets.
External funding	ASOCAFÉ has managed technical and financial support from the PROEX fund and the FFF-FAO project for the implementation and maintenance of ASFs.
New techniques	ASOCAFÉ has introduced techniques such as planting on contour lines and at shorter distances, and the renovation of coffee plantations using the pillu method.
Crop diversification	ASOCAFÉ has promoted the cultivation of forest and fruit species (siquili, avocado, citrus) alongside coffee, increasing product diversity and food security.
Expansion plans	ASOCAFÉ plans to update its statute to incorporate more members, increase exports, position its brand, and implement programmes with forest and sycamore species.

It is important to note that these innovations are not necessarily complex technologies, but rather practices adapted to the local context and based on traditional knowledge, observation and experimentation. These practices have enabled ASOCAFÉ's partners to improve the sustainability and productivity of their coffee crops.

7.2 Remaining challenges

ASOCAFÉ needs to adopt a holistic approach to face current and future challenges. This involves combining technical expertise with sound economic strategies, promoting sustainable practices and encouraging the active participation of all its members. Table 8 is a summary of what ASOCAFÉ perceives to be its persistent challenges, the actions it can take to overcome them and the external support that it considers useful.

Table 8. Challenges faced by ASOCAFÉ and suggested external support

Persistent challenges	Actions required	Suggested external support
Coffee pests and diseases (rust, ojo de gallo)	Implement integrated pest and disease management, combining biological and cultural methods. Use disease-resistant coffee varieties.	Research and development of new disease-resistant coffee varieties and specialised training in integrated pest management.
Low soil fertility	Promote the use of organic fertilisers and the production of green manure, as well as the recycling of nutrients within AFS. Conduct soil analysis to adjust fertiliser application.	Technical support in soil analysis and fertilisation recommendations. Financing for the purchase of organic inputs. Training in the production and use of organic fertilisers.
Labour	Train partners in agroforestry practices that reduce the need for intensive labour. Implement new technologies that reduce the labour burden.	Support for the acquisition of tools and equipment to facilitate work in the field. Training in the use of new agricultural technologies.
Unstable markets and prices	Increase the collection capacity of cherry coffee in order to have higher sales volumes. Explore new international markets to reduce dependence on intermediaries. Implement a fair payment system for producers, considering the export value.	Support in identifying markets and marketing coffee. Financing to improve collection and processing capacity. Technical assistance on international trade issues.
Traceability	Implement traceability systems that meet EUDR requirements, including parcel identification and grain tracking from harvest to export.	Financial and technical support for the implementation of traceability systems. Technological platforms that facilitate the monitoring of deforestation and traceability of agricultural products.
Adaptation to climate change	Promote crop diversification and the use of resistant varieties. Manage shade in coffee plantations to regulate temperature. Implement climate-smart agriculture practices (use of cover crops, irrigation systems).	Technical and financial support for the implementation of climate change adaptation practices. Access to climate monitoring information and tools.

7.3 Policy recommendations

Policies that have threatened their agroforestry systems include the lack of specific government support for agroforestry: currently, only forest programmes are funded and not agroforestry for coffee. Additionally, the focus of communities is on other crops such as cocoa with state support. An additional challenge is complying with the European Union Deforestation Regulation (EUDR) regulations on deforestation regarding traceability and georeferencing requirements. To create a more conducive environment for the spread of agroforestry systems, the following policy changes could be implemented:

- **Targeted and supportive government policies:** It is crucial that the state at municipal, departmental and national levels implement clear policies that encourage agroforestry, including

economic incentives and direct funding for producers. These policies should simplify regulations on the management of trees on agricultural land and address the challenges of the EUDR regulation on deforestation.

- **Strengthening technical assistance and rural extension:** Technical assistance and rural extension programmes should be continuous and adapted to local needs, promoting diversified agroforestry practices and the use of innovative technologies. Emphasis should be placed on the design and management of agroforestry systems with minimal technological practices.
- **Access to fair markets:** It is necessary to strengthen local markets and create value-adding channels for the commercialisation of coffee and agroforestry products and byproducts, promoting fair prices for producers. Other international markets such as Asia should be explored to reduce dependence on current markets.
- **Promoting research and innovation:** Investment should be made in research to develop crop varieties that are resistant and adapted to different agroecological conditions, as well as in technologies that facilitate the management of agroforestry systems.

External support partners should provide comprehensive support including financing, technical assistance, market linkages, innovative technologies, research and policy support. The aim is to create an enabling environment for the dissemination and sustainability of agroforestry systems, taking into account the specific needs of each community.

7.4 General conclusions from a comparison with other case studies

The authors have also studied three other coffee agroforestry systems including the producer groups ASOCAFÉ, Central Local de Cooperativas Agropecuarias Caranavi (CELCCAR – Local Centre of Agricultural Cooperatives of Caranavi), Asociación de Productores de Café Ecológico (Aprocafé Bolivia – Association of Organic Coffee Producers) and Cooperativa Integral Agrícola Productores Ecológicos (CIAPEC – Comprehensive Agricultural Cooperative of Organic Producers). The comparison highlights their common focus on promoting agroforestry systems and adoption among their members with the aim of improving livelihoods and fostering climate-resilient landscapes. Table 9 details the key similarities found in the studies with respect to these organisations.

Table 9. Common elements between four coffee-based agroforestry systems

Element	Detailed similarities
Main objective	Promote the adoption of AFS to improve members' livelihoods and create climate-resilient landscapes. All organisations seek to harmonise agricultural production with the preservation of the environment, improving the livelihoods of their members through sustainable practices.
Structure of the agroforestry system (AFS)	Implementation of the agroforestry system (AFS) with three main strata: upper (timber trees as cedar, toco and mara), middle (fruit trees and leguminous plants such as siquili, avocado and banana), and lower (coffee and other crops such as bean). The appropriate selection of species for each stratum is fundamental to optimise the benefits of the AFS, such as improved coffee quality, reduced environmental impact and income diversification for producers.
Common species	Use of species such as siquili (<i>Inga edulis</i>), cedar (<i>Cedrela odorata</i>), mara (<i>Swietenia macrophylla</i>), avocado (<i>Persea americana</i>) and banana (<i>Musa paradisiaca</i>) in the AFS. These species are consistently found in the AFS implemented by the different organisations, although there may be variations according to local conditions and individual farmer preferences.
Training and technical assistance	Each offers workshops and courses on agroforestry practices and plantation design. Forest and farm producer organisations (FFPOs) provide technical training through workshops and meetings, explaining the benefits of AFS and best practices for their implementation. FFPO technicians provide guidance on the design of agroforestry components, seed selection and pruning techniques. Some plots serve as demonstration plots, where partners and other producers can directly observe the benefits of the agroforestry system.

Seed and seedling sources	Seed is obtained from various sources: farmers' plots, farmer-to-farmer exchange, external projects (such as CLAC and FFF) and FFPO-supported or own nurseries. Farmers obtain seed from their own plots, identifying mother plants with good characteristics, such as good grain, high productivity or pest resistance. In some cases, farmers share or exchange seeds among themselves. FFPOs facilitate access to seeds of improved varieties and seedlings from national coffee programmes and external projects.
Perceived benefits	Income diversification, improved soil health, increased biodiversity, food security and climate resilience. Partners perceive multiple benefits in the overall productivity and health of their farming systems by implementing agroforestry practices. The presence of trees and other species in their AFS contributes to the generation of organic matter, which enriches the soil with nutrients. AFS promote biodiversity by attracting pollinators and other beneficial organisms.
Common challenges	Management of coffee diseases (rust, ojo de gallo), low soil fertility, high labour demand (especially for weeding), price instability and compliance with EUDR regulations. Disadvantages of AFS in coffee production include management complexity that requires greater knowledge and skill, as well as a higher labour requirement, especially for weeding. Production costs are mainly focused on labour, seedlings and fertilisers.
Markets	Sale of products in local, national and international markets. Each emphasises organic and fairtrade coffee production to access better prices. The main end markets for members' AFS products include local, national and international markets. FFPOs facilitate the marketing of organic coffee to international markets and establish partnerships with key buyers.
Key innovations	Implementation of techniques such as no-burn check, organic manuring, pruning, use of efficient microorganisms, contour planting design and crop diversification. FFPOs have been instrumental in the adoption of more diverse AFS by their partners through several key mechanisms, such as training and technical assistance. They have also facilitated access to improved seeds and seedlings and promoted the renewal of coffee plantations with more productive and resistant varieties.
Recognition of producers	Recognition of partners through assemblies where they share knowledge and experiences of innovations they use. It is important to note that the innovations are not necessarily complex technologies, but rather practices adapted to the local context and based on traditional knowledge, observation and experimentation.

7.5 Model agroforestry system adaptable to Bolivian conditions

From this comparative analysis we can visualise or propose a model agroforestry system (AFS) based on the experiences of ASOCAFÉ, CIAPEC, CELLCAR and Aprocafe Bolivia, as it is important to consider the common elements and the specific adaptations of each organisation. Table 10 summarises a diversified coffee agroforestry model, adaptable to the local conditions of each context. Table 11 then outlines the common advantages and disadvantages found in the ASOCAFÉ, CELCCAR, Aprocafe Bolivia and CIAPEC studies with respect to agroforestry systems. Finally, Table 12 provides an overview of the key findings and most important recommendations of the case studies studies, highlighting the importance of integrated support, innovation, adaptation and active participation for the success of agroforestry systems.

Table 10. Proposed diversified coffee agroforestry model, adaptable to Bolivian conditions

Component	Description	Common species	Benefits
Canopy timber trees	Timber trees that provide regulated shade, sequester carbon and generate long-term income.	Cedar (<i>Cedrela odorata</i>), toco (<i>Enterolobium contortisiliquum</i>), mara (<i>Swietenia macrophylla</i>) and laurel (<i>Laurus nobilis</i>).	Sunlight regulation, carbon sequestration, improved soil structure, timber sales revenue.
Medium-canopy timber trees	Fruit trees and leguminous plants that diversify income, provide food and improve soil fertility.	Siquili (<i>Inga edulis</i>), avocado (<i>Persea americana</i>), banana (<i>Musa paradisiaca</i>), citrus (orange, lime, mandarin), ceibo (<i>Erythrina poeppigiana</i>).	Income diversification, food security, nitrogen fixation, pollinator attraction, soil health improvement.
Shade-tolerant crops	Cultivation of improved and disease-resistant coffee varieties.	Coffee (<i>Coffea arabica</i>) (caturra, catuaí rojo, castilla, pacamara and mondo novo varieties).	Production of high-quality coffee.
Root crops and within the AFS	Combination with subsistence crops for food security.	Bean (<i>Phaseolus vulgaris</i>), maize (<i>Zea mays</i>)	Food security, income generation.
Management practices	Organic compost and mulch: Use of natural compost and mulch from the decomposition of tree leaves and leguminous plants. Shade control: Regular pruning of trees to adjust the amount of light reaching the coffee.	Efficient microorganisms, natural compost, mulch, fungi and decomposed leaves.	Improved soil fertility, erosion control, moisture regulation, reduced need for chemical fertilisers.

Table 11. Common benefits and disadvantages of agroforestry systems for coffee

Aspect	Common benefits	Common disadvantages
Diversification	<p>Increased diversity of food and useful household products.</p> <p>Diversification of income through the sale of multiple products (coffee, fruit, timber).</p> <p>Reduced dependence on coffee as the only source of income.</p>	<p>Complexity in handling requiring greater technical knowledge and skill.</p> <p>Need for more manual labour, especially for weeding and maintenance of the system.</p>
Environmental	<p>Improved soil health and green manure production.</p> <p>Erosion control and water management.</p> <p>Increasing biodiversity by creating habitats for beneficial insects, pollinators and birds.</p> <p>Adaptation to climate change by regulating temperature and providing shade and carbon sequestration.</p>	<p>Difficulty in the initial set-up of the system.</p> <p>Possible depletion of nutrients in the soil if not properly managed.</p> <p>Climatic risks such as droughts affecting resource availability.</p> <p>Excessive shade can affect coffee production if not properly managed.</p>
Economic	<p>Access to international markets that value sustainable production and fair trade.</p> <p>Potential to improve coffee quality and obtain better prices.</p> <p>Increased resilience to market fluctuations due to product diversification.</p>	<p>Instability of coffee prices and difficulty in accessing stable markets.</p> <p>High costs of implementing and maintaining the AFS.</p> <p>Dependence on external financing to cover production costs.</p> <p>Lack of marketing and management knowledge on the part of producers.</p>
Social	<p>Benefits shared by all family members, including women and youth.</p> <p>Preservation of traditional agricultural practices and local knowledge.</p> <p>Improved food and nutrition security for families.</p>	<p>Low youth participation and need for greater awareness of the benefits of AFS.</p> <p>Lack of internal communication and governance in some organisations, leading to mistrust.</p> <p>Division in the communities, where some members have left the cooperative.</p>

Table 12. Summary of findings and recommendations from four Bolivian agroforestry case studies

Organisation	Key findings	Key recommendations
ASOCAFÉ	ASOCAFÉ has proven to be a key actor in the promotion of AFS in Taipiplaya. Through training, innovation and diversification, the organisation has improved the living conditions of its members and contributed to environmental conservation. However, to ensure long-term sustainability, more external support and clear government policies are needed.	Implement governmental public policies to support agroforestry. Strengthen technical assistance. Ensure access to fair markets. Promote research and innovation. Improve the harvest and post-harvest process, modernise drying, rearrange coffee plantations with leguminous and forest species, increase exports, position its brand, include more women and youth, establish a coffee roaster and seek financing for expansion.
CELCCAR	It is crucial that CELCCAR improves its governance and internal communications to foster trust and active participation of partners. It should explore new marketing channels to re-export its coffee and diversified products and ensure access to stable markets that offer fair prices. CELCCAR should also encourage the adoption of innovative practices and approaches to improve the productivity, sustainability and resilience of AFS.	Train technicians in agroforestry management practices with a practical approach, valuing the local experience of producers. Develop markets for forest products, facilitate access to mini-processing plants, diversify markets for coffee, provide continuous financial support, and train producers to promote their autonomy.
Aprocafe Bolivia	Aprocafe Bolivia has been instrumental in the adoption of more diverse AFS by its partners through several key mechanisms. First, the organisation has provided training and technical assistance to farmers. Aprocafe Bolivia has also facilitated access to improved seeds and seedlings and promoted the renovation of coffee plantations with more productive and resistant varieties.	Aprocafe Bolivia can overcome the challenges by strengthening its internal organisation, adopting sustainable agricultural technologies and practices, and diversifying its products. It should also encourage the creation of support networks and the exchange of knowledge between farmers, extensionists and scientists.
CIAPEC	CIAPEC has implemented several key strategies to facilitate the adoption of more diverse AFS among its smallholder members. It offers training and hands-on workshops (one of the decisive ways in which CIAPEC drives the adoption of AFS) as well as workshops that require the implementation of what has been learnt directly.	Promote the certification of agroforestry products to improve their market positioning. Develop lines of research to improve post-harvest protocols and add value to products. Facilitate access to carbon credits and other financing mechanisms. Promote diversified AFS for ecosystem services such as carbon sequestration and water regulation.

In addition, the following should be considered:

- **Comprehensive support:** An approach that combines financial resources, technical assistance, access to markets and favourable public policies is crucial to the success of agroforestry initiatives, as well as external support partners who value local expertise.
- **Innovation and adaptation:** Encouraging the adoption of innovative practices and approaches will improve productivity, sustainability and resilience of agroforestry systems. Technical recommendations should be adapted to local conditions and preferences, as well as species diversity and system sustainability.
- **Active participation:** All members should actively participate in the decision-making and management of the co-operative.

References

CATIE (2024). Turrialba, Costa Rica. Memorias del curso de formación virtual: Agroforestería en Café y Cacao (2024). Editors: Luis Orozco Aguilar and René Jarquín Díaz

Macqueen, D (2024) [Advancing agrobiodiversity: why organisations of smallholders and Indigenous Peoples are vital](#). IIED, London.

Appendix 1. Testimonials from ASOCAFÉ members

Clotilde Titirico Wallpa, Huayna Potosí community, ASOCAFÉ



Clotilde Titirico is a producer from the Huayna Potosí community. She has been living on her plot for more than six years and is part of ASOCAFÉ. Her testimony offers a valuable perspective on the benefits and challenges of agroforestry and coffee production within this organisation. ASOCAFÉ told Clotilde about coffee cultivation years ago, which led her to engage in coffee production. Subsequently, she has incorporated other species such as siquili and fruit trees, which indicates the adoption of a diversified agroforestry system. She recognises that shade is fundamental to coffee production, after observing that production declined when she removed shade trees.

Initially, she focused on coffee, but later diversified their production with other species. This diversification is a key feature of agroforestry systems, where different crops are combined to improve sustainability and income. Clotilde participates in ASOCAFÉ’s organic production programme and is committed to following internal organic production standards. Her plot is registered and recognised by the internal control system. This is important because ASOCAFÉ implements traceability of its coffee through organic certification.

Clotilde grows the caturra and catuaí coffee varieties on her plot. Clotilde commits herself to care for the environment, flora and fauna, as well as to participate in environmental management trainings. Clotilde gives her cherry coffee to the association, which must be produced on her registered plot of land.

Clotilde Titirico’s testimony highlights the transition from coffee production to the implementation of an agroforestry system with the inclusion of other species, and the importance of shade in coffee production. Her participation in ASOCAFÉ’s organic production programme reflects a commitment to sustainable agricultural practices. Figure 6 is a black and white hand-drawn diagram by Clotilde showing the structure of the agroforestry system and its components in cross-section.

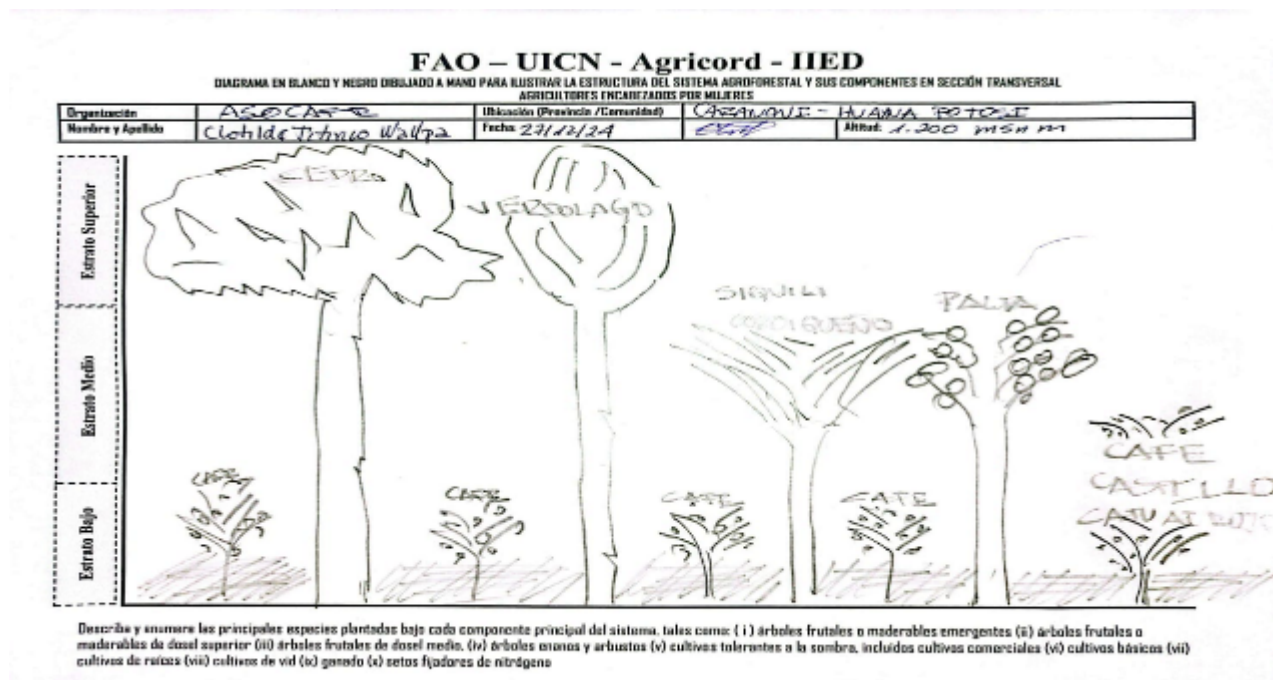


Figure 6. Diagram of coffee agroforestry system by Clotilde Titirico Wallpa

Eugenio Villca Maldonado, Ingavi community, ASOCAFÉ

Eugenio Vilca Maldonado, from the Ingavi Community, is a member of ASOCAFÉ who offers a valuable testimony about his experience with the agroforestry system and coffee production. His account includes historical, technical and organisational aspects within the association.



Eugenio says that he started growing coffee in the 1980s, and since then he has understood the importance of shade for this crop. He recounts how, after returning to his community, he proposed selling coffee in La Paz, which led to an initial organisation of producers to bring coffee to the city. Subsequently, the Taipiplaya Federation brought together all the producers and ASOCAFÉ was formed. José Ramos assumed the role of president of ASOCAFÉ and the United Nations Development Programme (UNDP) Agroyungas project supported the implementation of the wet processing plant, as well as other organisations in the Caranavi area.

He notes that initially the soil on his plot had organic matter, but on a small scale. He noticed that other plots had a good amount of organic matter, which meant that they did not need fertiliser, only liming. Now, his own plot is low in nutrients and he feels the need to use compost following the recommendations of the technicians. This shows that Eugenio recognises the importance of organic matter in soil fertility and the need for proper management.

He indicates that ASOCAFÉ technicians, through workshops, have spoken to his community about the agroforestry system, but acknowledges that on many occasions he and others have not followed the technicians' advice. However, Eugenio expresses the need to improve the fertility of his soil with fertilisers, which indicates that he is open to follow technical recommendations to improve the production of his plot. This openness to technical recommendations could be used by ASOCAFÉ to improve the adoption of agroforestry practices.

This testimony offers a comprehensive view of a farmer who has evolved with the agroforestry system, but still faces challenges in soil fertility and the adoption of best practices. Figure 7 shows a black and white hand-drawn diagram by Eugenio of his coffee agroforestry system in cross section.

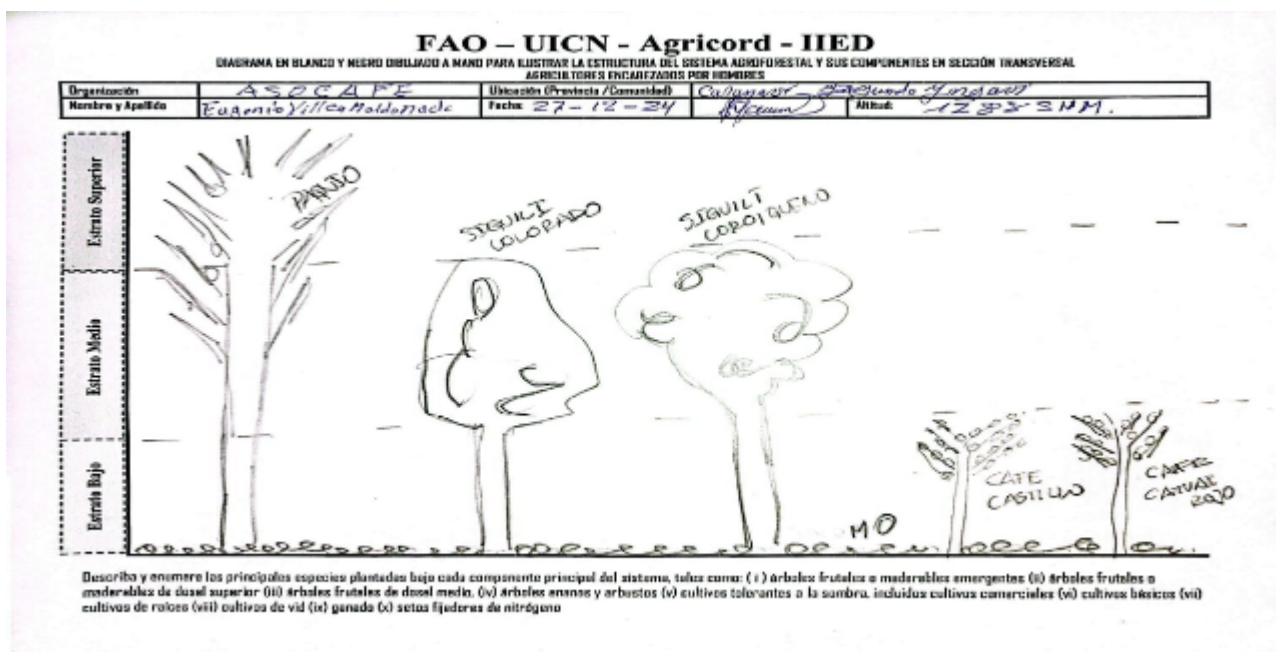


Figure 7. Diagram of coffee agroforestry system by Eugenio Villca Maldonado

Juan Quispe Luna, Tres Estrella community, ASOCAFÉ

Juan Quispe is an ASOCAFÉ member who has shared his testimony about the agroforestry system, highlighting aspects of learning, benefits and some challenges. His experience highlights the importance of training and observation in the adoption of agroforestry practices.



Juan mentions that, together with Lucio Vino, he has implemented new techniques such as planting new coffee varieties and renovating coffee plantations using the anoxic water pillow technique. Previously, he cultivated varieties such as catura and criolla. He stresses that he learnt to do the pillo, a technique that consists of planting at thirty centimetres. The implementation of this technique came after guidance from Lucio Vino. In addition, he mentions that by observing the good results obtained with the pillo method, he plans to continue using it in other plots in the future.

He recognises that organic matter is beneficial for his coffee plot and that other plots without organic matter do not produce coffee optimally. He points out that on plots without organic matter, rainwater is not well used and is lost, which highlights the importance of organic matter for moisture retention.

Juan also mentions that, although his community talks more about coca than coffee, his plot serves as a demonstration. He has learnt how to renovate coffee plantations using the anoxic water pillow technique, and that this knowledge has been fundamental for the improvement of his production. He also points out that in his plot, where there is organic matter, there is more humidity.

Juan's testimony reflects a positive change in his practices and a greater understanding of the importance of organic matter and the renovation of coffee plantations, as a result of the training received by ASOCAFÉ. Figure 8 shows a black and white hand-drawn diagram of Juan's coffee agroforestry system in cross section.

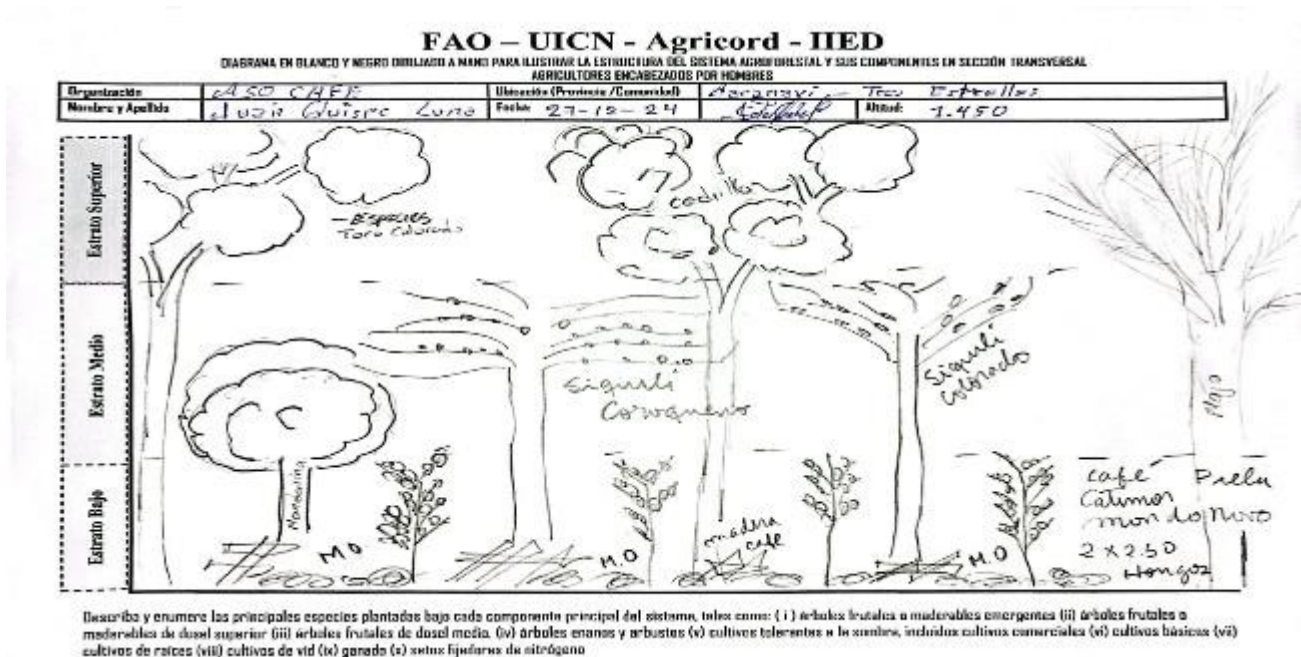


Figure 8. Diagram of coffee agroforestry system by Juan Quispe Luna

René Millares, Amor de Dios community, ASOCAFÉ

René is an ASOCAFÉ member who has shared his testimony on the agroforestry system, highlighting the evolution of his practices and the diversification of his production. His experience offers a perspective on how technical assistance has influenced their farming methods.



René says that initially he planted coffee and then, with the arrival of ASOCAFÉ technicians, he received training on how to plant and how to manage the weeds. In addition to coffee, René mentions that he also harvests avocado outside his coffee plantation and lime and mandarin inside the plantation. René's statement about how the technicians explained to him how to plant and manage the weeds suggests a continuous process of learning and adaptation.

René's testimony highlights the evolution of his farming practices from an initial coffee crop to a more diversified agroforestry system, thanks to the technical assistance provided by ASOCAFÉ. The inclusion of avocado, lime and mandarin in their production not only diversifies his sources of income, but also improves his food security.

The adoption of these practices indicates an understanding of the benefits of agroforestry and a commitment to continuous improvement of their farming methods. Figure 9 shows a black and white hand-drawn diagram of his coffee agroforestry system in cross section.

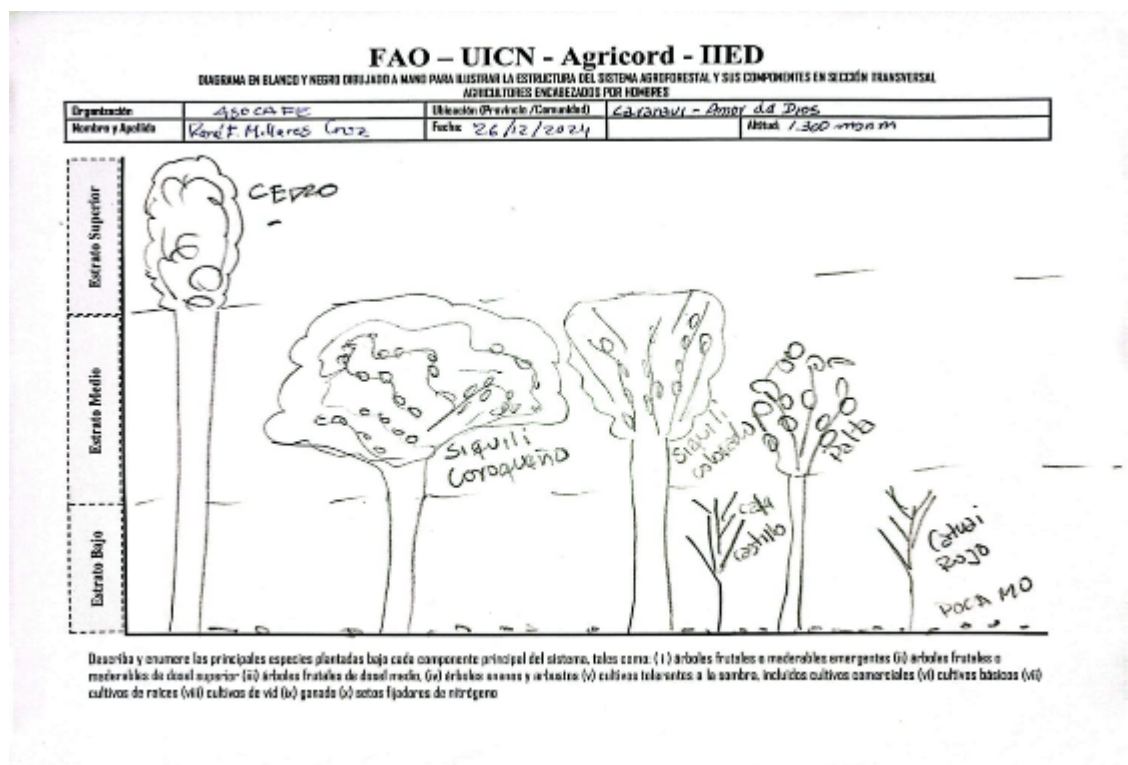


Figure 9. Diagram of coffee agroforestry system by René Millares

Jhola Blanca Mamani Titirico, Villa Victoria C community, ASOCAFÉ

Jhola is an ASOCAFÉ member whose testimony provides valuable information about her experience with agroforestry systems, highlighting her learning, the benefits she has gained and the challenges she has faced.



Six years ago, Jhola participated in training courses as part of a CLAC and Frente de la Unidad Progresista (FKGP) programme, guided by engineer Luis Vino. In these courses, she learnt about agroforestry systems, which prompted her to implement them. She has diversified production, growing avocados for sale, in addition to her main product, coffee. Although avocado production is 30% less compared to coffee, this diversification represents an additional source of income.

Jhola notes that, thanks to the new practices, she now has more coffee plants in a smaller area (a cato – equivalent to about a third of an acre) and is therefore harvesting more coffee. This increase in productivity is due, in part, to the fact that the plants are closer together, resulting in higher profitability. She indicates that she produces compost on her plot thanks to the siquili trees.

In her community, Jhola has noticed that in the assemblies and federations they talk more about cocoa than coffee, as many people live off cocoa. The biggest difficulty was the establishment of their first coffee plantation, as they planted after clearing the land without then burning. They have learnt various other techniques including fertilisation, weeding, skeletal pruning, high pruning, pruning at altitude, the use of efficient microorganisms and the construction of water reservoirs.

Despite initial challenges, such as planting without burning and the lack of attention to coffee in her community, Jhola has managed to improve her production and has plans to further expand and diversify her crop. Her experience demonstrates the importance of training, adoption of agroforestry practices and crop diversification to improve the quality of life of farmers. Figure 10 shows a black and white hand-drawn diagram of Jhola's coffee agroforestry system in cross section.

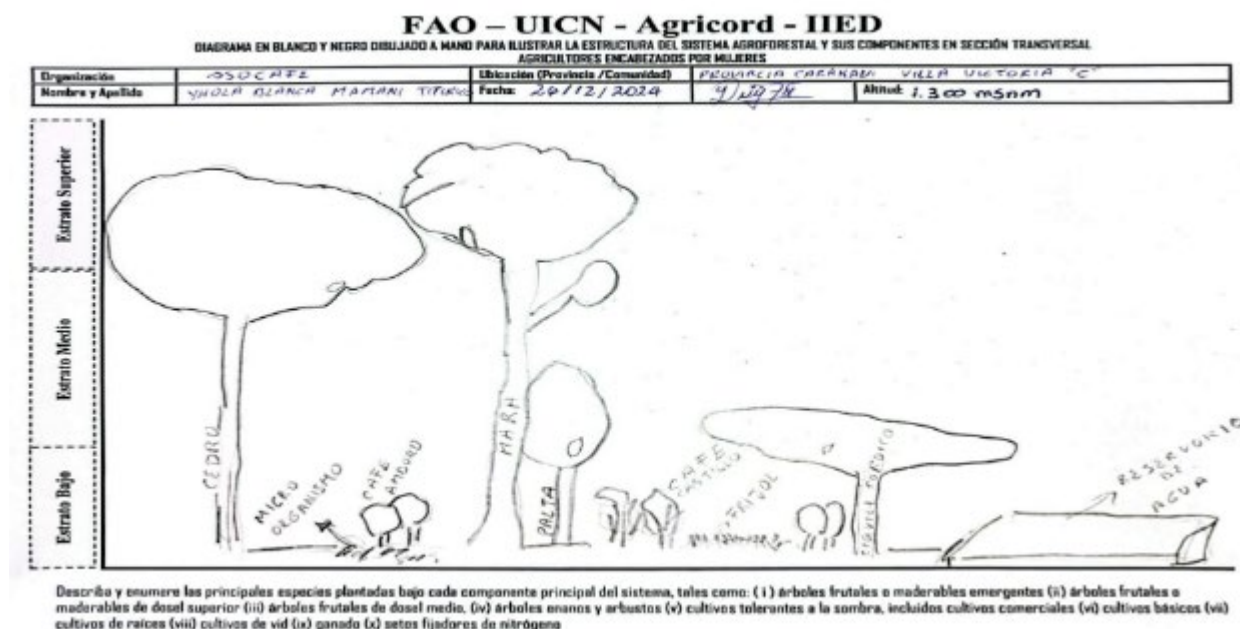


Figure 10. Diagram of coffee agroforestry system by Yola Mamani Titirico