

Strengthening capacity to diversify farmer business models for climate resilience

Producer organization: Viet Nam Cinnamon and Star Anise Cooperative



Vietnam - Climate Resilience Case Study No. 9

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Cover photo: The Cinnamon and Star Anise Cooperative weeding cinnamon trees - Photo: H.T. Thoan, 2020.

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Photos of cinnamon trees growing in Yen Bai and felled for bark removal. Photos: Ho Thoan



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EXECUTIVE SUMMARY

This case study describes how the Viet Nam Cinnamon and Star Anise Cooperative is enabling its members to become more resilient to climate change in Dao Thinh commune, Tran Yen district, Yen Bai province in the North of Viet Nam.

Climate change has become a prominent issue, negatively affecting socio-economic and environmental activities in many regions of the world (IPCC, 2007), which makes the frequency and intensity of natural disasters is increasing. The UNDP Human Development Report 2007-2008 pointed out that natural disasters are a major cause of poverty and vulnerability in Vietnam. Most of the poor live in rural areas and make a living from agriculture-forestry activities.

Currently, Vietnam is still an agricultural country with 75% of the population being farmers and 70% of the land area being rural, where people's lives depend mainly on natural resources and self-reliance. Moreover, agricultural production in Vietnam is still mostly small-scale with negligible scientific and technological investment. It means that agricultural production is still heavily dependent on natural conditions and complex ecosystems. But as we shall see, this has some advantages for climate resilience.

In Yen Bai province, the annual average annual temperature has increased over recent years, while the average annual rainfall has decreased. Extreme events have included landslides; droughts; floods; cold spells; and hailstorms that have increased crop damage, increased the incidence of disease, reduced yields as well as significant human and property losses. Extreme weather events combined with the sloping terrain of Yen Bai have made the damage even more severe.

Despite such threats, an approach for establishing sustainable forest product-based enterprises has strengthened the resilience of local farmers through a structured process of market analysis and development built initially around the cinnamon value chain. They have then started to diversify products and add value to products within their core value chain. They have also started to diversify into additional and alternative value chains to gain further resilience. Viet Nam cinnamon and star anise cooperatives in Dao Thinh commune, Tran Yen district, Yen Bai province has gradually overcome difficulties and is now widely recognised for its remarkable achievements. This development process over the past three years has drawn heavily on the determination of its cooperative members, support from the Vietnam Farmers Union and finance and technical advice from the Forest and Farm Facility (FFF).

The starting point for this cooperative was 4 small farmer groups growing cinnamon amongst many other crops, with 3-11 households/ per group. At that time in 2015, the members of those groups just sold raw cinnamon products to middlemen and small traders. They sold product individually at low and precarious prices, depending on traders and faced difficulties in the market. Their natural resource management was rudimentary, and they faced various (some linked to climate change as described above). They also faced social and institutional challenges linked to their isolation and had not formalised a strong organisation with legal standing. Their technology for processing products scarcely existed.

Three years later, there is a remarkably different situation. In 2017 they worked together to establish a single formalised cooperative under the Cooperative Law 2012 of Vietnam. By 2019 they had attracted inward investment for building a processing factory, developed an organic cinnamon value chain, diversified a range of cinnamon products; diversified the ecosystems of members farms; and have now started to diversify their income streams from other from forest and farm resources. This practical development of a functional cooperative has proved that smallholder farmers can rapidly develop climate resilient business models coping effectively with climate change.

With hindsight, the process of cooperative development can be systematized into 7 key steps as follows:

Step 1: Recognizing benefits of cooperation in the face of increasing external risks.

Step 2: Community engagement

- Member need assessment and strengthening the organizational structure of farmers and leadership capacity

- Collaboration with community and stakeholders; Building rapport and trust.
- Identification of community production goals, and the main barriers including adverse effects of weather conditions.

Step 3: Identification of production vision and SWOT analysis leading to the formation of producer groups, then an inter-collective group, and then finally a cooperative

- Risk management: Identification strengths, weaknesses, opportunities, and challenges, including identifying vulnerable factors.
- Market analysis and development that involves collecting information on five areas of enterprise development (market/ economy; natural resource management/ environment; social/cultural; institutional/ legal; technology).
- Developing of the organizational structures

Step 4. Business incubation to build staff capability within business organisations

- Techniques and skills building, coaching, and following up
- Consulting experts and facilitators to find practical solutions to production problems.

Step 5. Production and business planning in core value chain

- Finding and learning about new sustainable production models and organic farming
- Investment/ financial contribution and finding resources from other programs and projects.

Step 6. Diversification into new value chains and markets

- Diversify products and business models in the cooperatives.
- Developing business and production plans integrated with sustainable resource management and climate change response plans.

Step 7: Implementation of further production pilots, evaluation, lesson learned and replication.

1. INTRODUCTION

1.1 NAME AND VISION

The Viet Nam Cinnamon and Star Anise Cooperative was developed from an inter-collective group and a cinnamon buyer and exporter (the Vietnam Samex exporting company).

With FFF facilitation, the capacity of four cinnamon farmer groups was increased in relation to market analysis and development. This helped them to assess their difficulties and understand the underlying causes of those difficulties – notably a lack of market scale. They decided together to form a single larger inter-collective group. Then, in the process of supporting market analysis and development, the Vietnam Samex exporting company and this inter-collective group connected and collaborated to establish The Viet Nam Cinnamon and Star Anise Cooperatives. This business model emerged as a "cooperative venture" that helped them mobilize resources and be eligible to obtain sufficient bank loan capital to build an advanced factory.

According to Vietnam's Cooperative Law, the Viet Nam Cinnamon and Star Anise Cooperative is a collective economic organization, with co-ownership and legal entity, and is established voluntarily by 23 members who mutually cooperate and assist in the production, sales and job creation to meet the general needs of all members. They do so based on self-control, self-responsibility, equality, and democracy in management of cooperative. Cooperatives of this sort operate under the Co-operative Law (2012).

The vision of the Viet Nam Cinnamon and Star Anise Cooperative is laid out below:

'In the next five years, the Viet Nam cinnamon and star anise cooperatives will continue to maintain and expand the organic production model, consolidating its leading position in the export cinnamon industry, raising Vietnam's Cinnamon industry in the world market, leading to it becoming a leader in spice production in Vietnam'.

The cooperative goes on to identify what to do next in terms of priorities:

- Purchasing all the cinnamon bark products from members and farmers in the region.
- Continuing to expand the area of organic cinnamon to 2000 ha.
- Supporting each other in maintaining and monitoring organic farming practices well.
- Promoting the products from the cooperative.
- Developing diversified business models through a series of cooperative groups (handicraft cooperative group, mulberry planting cooperative group, medicinal plant cultivation and beekeeping cooperative group).

The organizational model of this cooperative includes the typical: Board of Directors, Director, Control Board, and specialized departments [see Annex 1 for the organisational structure]. The general meeting of members elects both the Board of Directors and Control Board. The Board of Directors of cooperatives or unions of cooperatives in Viet Nam is the management agency of the cooperative and is established by consensus or elected and can be dismissed or removed by general meeting of members by secret ballot. At the present time, the main positions in the Board of Directors of the cooperative are as follows. The Board of Directors is made up of (1) Nguyen Tri Tue (Chairman of the board), (2) Nguyen Que Anh (Vice Chairman of the Board), (3) Nguyen Chi Thuan (Vice Chairman of the Board).

The Management Directorate is the executive that oversees the operations of the cooperative. It has the following powers and tasks: organizing the implementation of business and production plan; signing contracts; submitting the Board the annual financial statement...etc. It is currently made up of (1) Nguyen Que Anh (Director); (2) Nguyen Tri Tue (Deputy director in charge of production), (3) Nguyen Ba Mao (Deputy director in charge of business).

The Supervisory Board operates independently, examines, and supervises the activities of cooperatives, in accordance with the law and charter. There are two supervisors in the board, including: (1) Pham Van Tien and (2) Nguyen Hong Thang.

1.2 LOCATION

Yen Bai province is in the northern mountainous region of Viet Nam. It is one of the most vulnerable areas to climate change because mountainous communities have their income mainly based on agricultural production. The equipment used in the agricultural sector is still very rudimentary, and this is also where the poorest regions of the country. Yen Bai has an average population density of 114 people / km² (2015) with 12 indigenous ethnic groups living together for a long time including: Kinh (accounting for 54%), Tay (accounting for 17%), Dao (accounting for 9.1%), Mong (8.1%), Thai (6.1%), Muong, Nung, San Chay, Giay, Kho Mu, Hoa and Phu La.

The total natural land area of the province is 6,886 km², ranking 8th compared to 12 provinces in the Northern Midlands and Mountains in terms of land size. The agricultural land area is 5,850 km², accounting for 84.96% of the natural land area. The area of the non-agricultural land is 537 km² accounting for 7.8%, and the unused land area is 498 km² accounted for 7.24%. Forest coverage is over 62%, ranking second in the country. Yen Bai has advantages to develop agriculture - forestry products in association with the substantial raw material in this region.

Dao Think commune has fertile soils and a relatively uniform educational level. The population is concentrated in small settlements, with a basic rural infrastructure system. Fortunately, the commune has a convenient and well-developed transportation system to trade with the major economic regions of the province, the district, and neighbouring communes. Therefore, the authorities and organizations at commune level have prioritized the development of an agro-forestry economy that combines handicraft, trade, and services. Accordingly, authorities have planned two major commodity economic development regions based on soil and climate characteristics to be implemented by local authorities:

- Region 1: Focuses on a thriving cinnamon trade based on this long-adapted crop, but applying scientific and technical advances in planting, tending, and processing edible cinnamon products according to organic standards. The region will promote investment into developing a processing industry for cinnamon timber products, cinnamon essential oil to create more jobs, combined with the development of services to meet the production needs and daily life of the people. Members of the cooperatives have cinnamon growing areas in this region.
- Region 2: Focuses on mobilizing people to convert crops from rice cultivation to mulberry and silkworm farming, diversify crops and products under forest and forest landscape, such as bee raising, herbal tree growing, mulberry planting and silk worm raising... to gradually form a concentrated commodity production area, attracting inward investment in developing small industry and handicrafts to strengthen a cooperative economic model (collective groups; cooperatives).

The concentration of production into regions will help regions to invest and develop products on a commodity scale.

1.3 FOUNDATION AND MEMBERS

In the Region 1 of Dao Think commune, each household has a land area of 1-2 hectares of cinnamon, which is the main crop that brings income to the households here. Cinnamon farmers often grow cinnamon in a very thick density without following technical recommendations, because they need to prune cinnamon branches and leaves to sell in the 3rd year to cover their livelihood costs.

Cinnamon growing groups had been established since 1993. Members of these groups were brothers, relatives, friends (about 3-5 households) who have the same intention, but little individual land. So, they work together to increase efficiency and manage resources more conveniently (for example, cinnamon growing groups assign one person to look after an entire cinnamon hill instead of having to look after their own cinnamon area as before).

They voluntarily formed informal groups (not yet registering with the local government nor receiving any support from the government) because they had seen the true benefits of working together, combining their land to develop their household economy. They were very united, actively supporting each other in labour exchanges and looking after the cinnamon hills, sharing production experience.

Cinnamon had a high economic potential, purchased mainly by the Chinese market. But during the period of 2012-2014, cinnamon growers encountered many difficulties, including:

- Mainly relying on traditional experience in producing and selling products in small groups with little bargaining power.
- Not yet having effective pest control measures, while extreme weather events were increasing, alongside more pests and diseases, for example, mycorrhizal fungus and leafworm on cinnamon, or burning of cinnamon tops.
- Lacking financial funds to reinvest in the purchase of processing machines, adding value to the products. Most of cinnamon farmers sold their raw cinnamon bark to middlemen and traders.
- Delays by the local authorities in measuring and certifying land certificates. Most of the households did not have a Land Use Right Certificate (LURC) – the certificate given with five land rights as regulated by Land Law. So, farmers could not mortgage land to borrow money from banks. Besides, they were also concerned that the government authorities could change the land use purpose at any time.
- A lack of forestry roads made it difficult for production and business activities. But farmers had not been proactive in seeking information about the commune's supporting policies or had not actively participated in union activities or meetings with government leaders to express their aspirations.
- A lack of market information and unstable cinnamon prices: price of products, product standards, focal points of consumption depended entirely on traders who sell goods to China.

Before 2015, Dao Thinh commune had 123 ha of natural forest, 504 ha of cinnamon trees, 178 ha of acacia, some other types of trees and tea. Poverty was running at 7.4% of households, and the average income per capita was 28 million VND / person / year (US\$ 1200).

In 2015, the Viet Nam Farmers Union (VNFU) started to work with the Forest and Farm Facility (FFF) Programme, a partnership between FAO, IIED, IUCN and Agricorn. During FFF activities such as: discussing, training and exchange visiting among farmers and informal groups, actors in the supply chain and authorities, they recognized that farmers should be well organized. They both needed to cooperative and build trust to mobilize the support of local authorities. With inspiration brought by FFF from other countries, collective farmer groups were a means of sharing market information and aggregating their supply and negotiating better prices for their high-quality products. This crucial early FFF-facilitated trust-building work led to the formation of four official collective cinnamon groups.

By 2016, these four groups had decided to associate with each other to become an inter-collective group with 39 members, having a total of 135 ha of cinnamon. After Market Analysis and Development (MA&D) training, the inter-collective group worked out a business plan, conducted a market research study, looked for potential buyers, explored partner companies, and introduced their cinnamon products in agriculture fairs to look for markets. The group also started learning and applying organic cinnamon growing techniques to improve the quality and image of their products.

The VNFU and FFF team helped to organise round table discussions between producer groups at commune, district, provincial and national level. Through these round table discussions, an organic cinnamon development strategy was approved by the local authorities which was mentioned in the local socio-economic development plan. The commune authorities supported the inter-collective group to build up nearly 2 km of cement forest roads to reduce transportation costs.

By sharing information with cinnamon exporters, the inter-collective group began to understand that to go further, they had to expand their cooperation and formalise it. In 2016, the members of the inter-collective group wanted to establish a cooperative to expand their organic cinnamon production, processing, and business with legal status accordingly to the Cooperative Law. With support of the provincial Yen Bai Farmers' Union (also involved in these round table discussions), the inter-collective group reached an agreement with local authorities on the lease of land for a processing plant. Household members of the inter-collective group were willing to put their own money into a joint business for organic cinnamon processing.

As these plans formulated, the inter-collective group also began to transform their production towards a sustainable agroforestry production system. Building up partnership cooperation with local enterprises, the members of inter-collective group started a 1.7 hectares organic cinnamon production area and step by step expanded the organic areas. With the support of FFF, the group has formed a new

management team on the development of organic cinnamon production with strong cooperation with enterprises.

In April 2017, with facilitation from FFF, the Viet Nam Cinnamon and Star Anise Cooperative in Dao Thinh was established with 23 members with co-investment from the Vietnam Samex exporting company, a private investor which later became a member of the cooperative.

The farmers in Dao Thinh commune soon expanded to more than 500 ha of organic cinnamon and the local authority allowed the cooperatives to lease 9900 m² land for factory building. Through resource mobilization among members and a considerable loan from the banks, factory construction commenced in 2018.

Figure 1. The cinnamon factory built by the Viet Nam Cinnamon and Star Anise Cooperative



By 2020, the cooperative has begun to produce 80-100 tons/month of 12 kinds of organic cinnamon product. The factory has created jobs for 70-100 people, with the majority being women. More than 600 forest farmers have been trained, and now apply organic farming in cinnamon production, alongside organic production of other crops and trees.

With the confidence on organic farming and support of Farmers' Union, a new environmental service cooperative and three new collective groups have been established to diversify products and provide services to members and farmers: One collective group grows organic herbal plants, one plants organic mulberry for a silk worm production facility and one is developing beekeeping. They use the already developed Internal control System (ICS) and are now starting to learn and apply a Participatory Guarantee Systems (PGS) which helps to distinguish their organic products in the marketplace.

Figure 2. Promotion of cinnamon products in a local trade fair and a member of a new beekeeping collective group in Yen Bai, Viet Nam.



Notwithstanding these remarkable achievements, the cooperatives is also facing some difficulties:

- The number of extreme weather events, pests and diseases has increased more in recent years due to climate change.
- Ensuring farmers' compliance with the ICS for organic cinnamon cultivation is challenging.
- There is a need to expand the production areas.
- The cooperatives now need to find resources to invest in further factories and equipment that meet standards to produce diversified product (about VND 88 billion – US\$ 3.8 million).
- Some farmers growing rice around the organic cinnamon areas still use chemical pesticides, which may affect the production and labelling of organic cinnamon.

To solve these difficulties, the cooperatives has been implementing the following activities:

- Training and raising awareness on organic farming, biodiversity and forest ecosystems, plant raising techniques, internal management
- Continuing to increase the number of members, expanding the area, attracting potential members in the surrounding communes.
- Supporting women and youth in starting businesses, supporting cooperatives/ cooperative groups in production, processing and trading other products from cinnamon, vegetables, herb medicine tree, honey, handicrafts, waffles, sales services.
- Researching and developing eco-tourism: agricultural tourism combined with indigenous cultural exploitation with the participation of women. They have already started to train women's groups in the skills needed to develop tourism (cooking food, speaking English, cultural activities, etc.).
- The cooperatives have been also actively mobilizing local people to apply and practice organic agriculture in the region so as not to affect the organic cinnamon areas and diversify other products under the forest canopy to increase income for farmers.

As these measures were being rolled out to address the challenges, in the first months of 2020, there were a series of extreme weather events including hailstorms, and whirlwinds that destroyed many houses, trees and crops of the people in Yen Bai province. Additionally, the Covid-19 disease has also affected cooperative in several ways:

- Increasing freight costs due to travel restrictions
- Generating a product backlog due to reduction of international orders
- Complicating the submission of product samples to customers.

In such a difficult context, the cooperative tries not to cut its staff. The cooperative continues to support and guide the surrounding farmers about organic production to increase the resilience of the ecosystem strengthening its ability to cope with the disadvantages of extreme weather, while diversifying products and increasing income for its members.

One such diversification has been to make use of available skills of making handicrafts of some members. With advice of cooperative and support of Commune Farmers' Union, a cinnamon-wood-handicraft processing group was established. This caters to women and young farmers and increases income for other farmers in the region so they would focus on organic farming practices more and make more value added from cinnamon trees/ timber.

Figure 3. Photo of the new cinnamon handicraft producer business



1.4 BUSINESS PROPOSAL

In the past, most of Vietnamese cinnamon products were sold raw to Chinese traders. They bought raw material, then processed and labelled it in China and sold it to the world market at prices many times higher than the raw products.

Nowadays, the cooperative has self-contained production processes according to strict European standards. It produces diverse product lines of high-quality organic cinnamon. This has increased the competitiveness of the products in the international markets and contributed to affirming the

Vietnamese Cinnamon and Star Anise Cooperative brand. The cooperatives' organic cinnamon products are well received by the markets.

The cooperative production and business plan is annually developed by the members of the cooperative. This plan allows the cooperative to monitor, evaluate production and business activities and share benefits among members.

In 2017, 2018 and 2019, the cooperative purchased materials, processed and packaged, with an annual output of about 1,500-2,000 tons / year including cinnamon and star anise. Their cinnamon and star anise processing factory includes an anise area of 16,000 m² that is equipped with modern machinery and large capacity.

Revenues from cinnamon and star anise production have been rising steadily:

- In 2017, the cooperatives were just put into operation.
- In 2018, it reached VND 12,000,000,000.
- In 2019, it reached about VND 27,000,000,000

The turnover of the cooperatives in the first three years of processing has been reinvested to complete the processing factory. Meanwhile, revenues from other products such as mulberries, cinnamon leaves, and cinnamon stems, from medicinal plants, from bees are used by the members of the cooperative to cover their daily lives. It is the diversified revenue from the wide range of products with diverse business models that has helped cooperative members minimize the negative impact of not being able to sell the goods during the Covid-19 pandemic. This also helps members have more revenue while the main product has no stable sales.

From production profits and loans from banks, the cooperative has now also invested about 40 billion VND (US\$ 1.7 million) to build small motels to serve guests coming to work at the facility and for community tourism services. In addition, to ensure the factory is not short of input materials in the production, the cooperatives buy more organic anise from Lang Son province to serve the processing.

With the support of local authorities, the cooperative has worked with members to allow water pipes to flow through their agricultural land. The cooperatives have invested in the system of bringing water from the waterfall to be more active in water sources for production and daily life, and the cooperatives has also built a mechanism to use water appropriately and economically.

1.5 MARKET CONTEXT

Previously, in Yen Bai province, there were many programs to encourage people to plant new varieties of plant such as Gac, rattan, etc. But these projects failed after people could not sell their products. The top-down approach and the lack of market linkages in agricultural extension activities revealed many limitations. For example, the agricultural extension agency formerly selected new plant varieties based on the recommendations of the national agricultural extension program, to obtain a budget for organizing activities. Then, extension staff trained for farmers to plant without follow-up activities. As a result, there had been many cases where people were instructed to plant a new variety in the first year but by the second year, it was completely removed because farmers could not find traders to buy it.

Before 2015, the Dao Thinh Commune had 123 ha of natural forest, 504 ha of cinnamon trees, 178 ha of acacia, some other various trees and tea; most of forest and cinnamon plantation farmers sold their products individually to local middlemen and sold raw products mainly to the Chinese market which was very precarious. They did not have market information and negotiation power. The price was determined by the buyers. There were a few unofficial cinnamon grower groups, without collective actions, which helped each other for new seedling plantation sometimes and produced conventional cinnamon with chemical fertilizer and pesticide use.

At that time, the cinnamon prices were low and not stable – and the income of the cinnamon growers was reduced because chemical fertilizer and pesticides costs were high, and they had little knowledge on market or processing options. In addition, the use of chemicals in agriculture reduced the aromatic quality of cinnamon products, depleted biodiversity and made the soil hard through lack of organic matter, resulting in a decrease in yield and product quality in the subsequent crops.

Through the market analysis and development approach that was developed with FFF facilitation, the cooperative found that, of the many possible cash crops, import demand for cinnamon in the world market had increased sharply in recent years, with a value of about USD 320 million in 2018, an increase of 38.5% compared to the average annual import demand of 5 years ago (from 2013 to 2017). They also discovered that to diversify consumption markets, especially markets such as Europe, the US, and Japan, products' quality standards needed to be raised to meet the standards of those markets.

After developing organic cinnamon product lines to meet the needs of the market, they continued to invest in producing with confidence. In close chain linkage buyer companies, the cooperative has sold its first batches to markets requiring high standards. With this momentum, the members of the cooperative focus on making good the process of producing and processing organic cinnamon, and spend their efforts and expenses to explore the market for other products according to what they have learned from the FFF program.

2. THE NATURE OF THE THREAT OF CLIMATE CHANGE

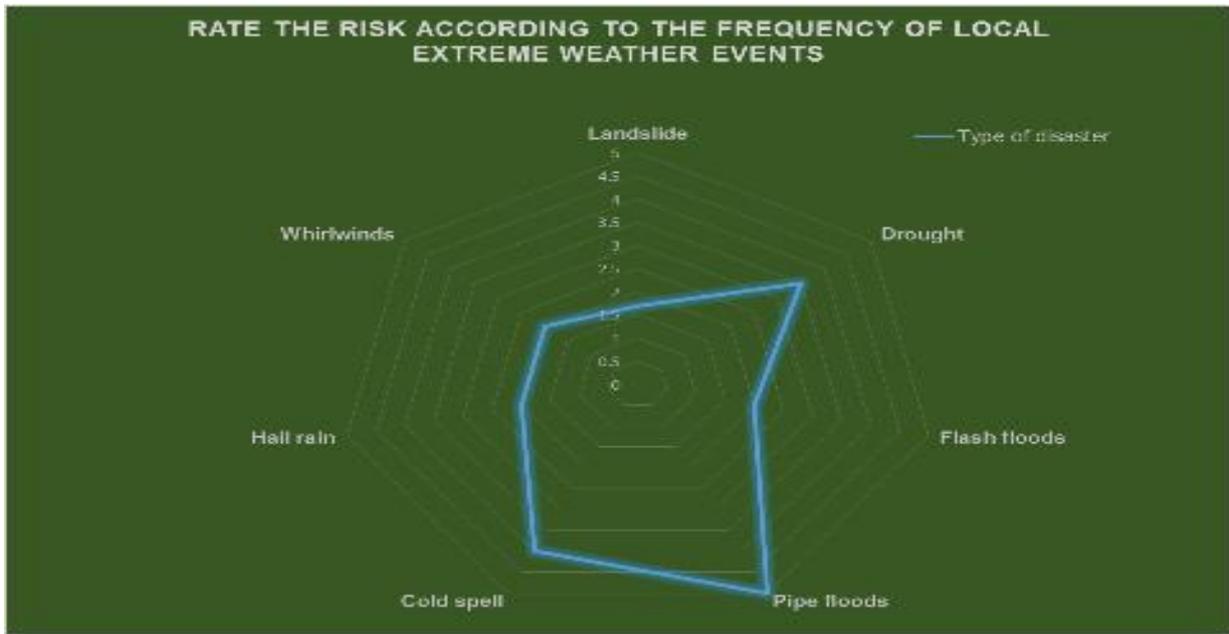
2.1 PERCEIVED CLIMATE CHANGE THREATS

Despite the economic developments within the Vietnam Cinnamon and Star Anise Cooperative, Vietnam is considered, in coming decades, to be among the most affected countries by global climate change. Extreme weather events have increased. Farmers' coping capacity is still limited – including in this cooperative.

The FFF support is given under the overall goal of climate resilient landscapes and improved livelihoods. Therefore, in the process of planning production and business, the cooperative started also to consider and pay attention to the risks that may occur and what are the solutions to prepare for those problems. Solutions that emerged from this process included: clearing fire breaks, planting trees along contour lines to reduce erosion, digging reservoirs to store water, investing in irrigation systems through piped water for dry spells, building factories to preserve and store quality products, investing in fire prevention equipment to prevent forest fire. But in addition to these technical solutions the cooperative also realised the importance of diversifying the ecological production systems, by diversifying products and organic methods that will also help the cooperatives to minimize climate related risks.

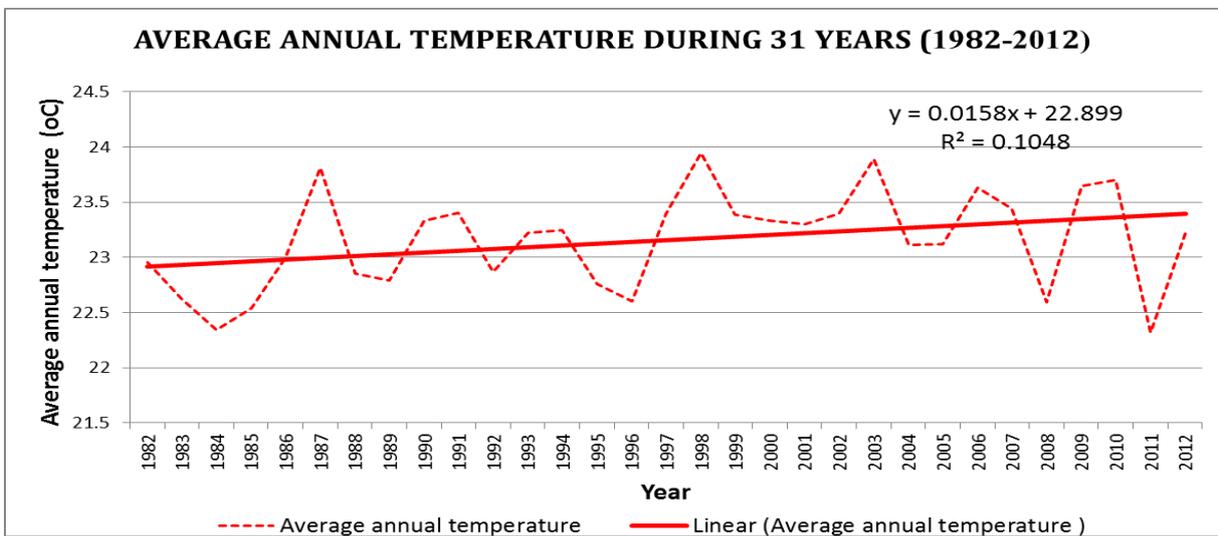
The number of north-east monsoon spells is also less than the previous years. The average annual temperature of Yen Bai province has tended to increase, increasing by 0.0780C every year. In contrast to the trend of increasing temperature, the average annual rainfall has decreased, but the number of rainy days with heavy rain intensity in the month has increased, focusing mainly on the peak months of the rainy season. Those trends are the main causes of flood, landslides, and drought. Extreme climate events related to temperature, rainfall such as pipe floods, cold spell and drought also has been occurring more frequently.

Figure 4. Level of occurrence of local disasters in 2014¹



Increasing average annual temperature causes changing crop growth and development, leading to sudden crop production changes. In addition, pests hatch earlier, grow stronger and generate pests and diseases. For example, turn rot on cinnamon trees has not had a specific fungicide developed to combat it yet; leaf roll epidemic is expanding on both the bodhi tree and cinnamon trees, which has greatly affected crop yield, there were years when the leaf roll worm broke out into an epidemic like 2009, 2011 and 2014, causing hundreds of hectares of forest losses each year [Annex 2].

Figure 5. Average annual temperature for 31 Years (1982-2012) in Yen Bai²

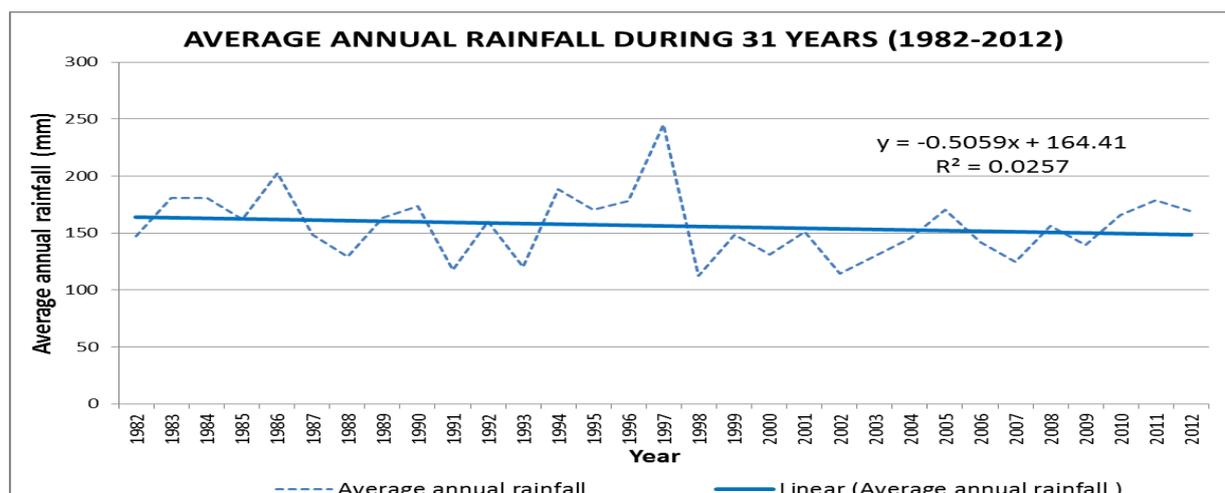


The change of the average annual rainfall makes the pollination of crops (maize, rice) unfavourable leading to low-grade rice and seedless maize. Farmers' income is reduced, livelihoods are affected, especially poor households.

¹ Survey of Luong Ngoc Cuong on the impacts of climate change on the community of people in Tran Yen district - Yen Bai. Using rural rapid assessment method

² According to the database system at the Meteorology and Hydrology Station in Yen Bai

Figure 6. Average annual rainfall for 31 Years (1982-2012) in Yen Bai³



2.2 IMPACT ON FOREST AND AGRICULTURAL RESOURCES

In Yen Bai province, damage from extreme weather events has been increasing while a lot of experience passed from generation to generation is not enough to use under current conditions.

Table 1: Damage caused by extreme weather events in Yen Bai³

No.	Change	Damage
1	 Drought	Increasing severity of droughts is driving up the likelihood of extreme fires. High temperature is associated with drought on some days in the summer, causing young cinnamon leaves to be burned out.
2	 Whirlwinds	Washing away plants and houses + In the first 4 months of 2020, there were three natural disasters caused by whirlwinds. Extreme weather events have injured 6 people, damaged more than 4,000 houses and damaged 326.5 ha of crops and other public works.
3	 Hailstorms	Causing damage to crop and houses
4	 Cold spell	Increasing severe cold spells have occurred: + Cattle and rice and seedlings died of freezing cold on a large scale + In 2008; 2016, cold spell with lowest recorded temperature for 40 years and snow falling that had not occurred in hundreds of years.
5	 Flash flood	Average annual rainfall has tended to decrease, but the intensity of rainfall has increased causing flash floods in the rivers. Sudden pipe floods and flash floods are intensified by the steep slope of the terrain that can wash away big houses and bridges. In 2017, more than 40 people died in flooding and landslides resulting from two historic flash floods. At the same time, the flood also destroyed hundreds of public works in the area with the crops of the people.
6	 Pipe/river flooding	
7	 Landslide	Causing damage to life and property. Rains lasts a long time, water has soaked in soil combined with steep terrain, so the risk of landslides is very high, and several have caused serious damage. There are landslides that cause some of Yen Bai's communes to be divided.

³ According to the Meteorology and Hydrology Station in Yen Bai

Weather information related to natural disasters and damage is also regularly reported in Yen Bai's radio stations so that people can grasp and take initiative in prevention soon.

In recent years, the unpredictable change of weather has caused many obstacles for farmers in their production activities and daily activities. If farmers do not have effective solutions to increase climate resilience in the future, they will face increasing difficulties.

2.3 IMPACT ON BUSINESS AND FINANCE

Under the sustained impact of surface water runoff and associated soil erosion, the quality of land, water, and forest resources has declined, resulting in a decrease in household income. Crop yields have been declined, while farmers have had to invest more in fertilizers and pesticides in their forest and farm – thus reducing incomes.

In Yen Bai, due to limited investment capital, many farmers have not been able yet to grow trees of high economic value and long-term cycles. In addition, when farmers do find capital many households cut down natural forest, then plant monoculture forests of cinnamon, bodhi, acacia, as well as burning upland areas to grow maize and cassava. This has been leading to an increase in soil erosion; the number and intensity of floods that wash away animals and crops. This is a vicious cycle of poverty if people do not change their farming practices and practice sustainable farming on sloping land.

Dao Thinh commune is strongly affected by drought, plus a large single-area cinnamon forest- cinnamon tree is rich in essential oils, so it is easy to risk forest fires in the summer.

The cooperatives have changed the way of farming, changing from conventional farming to organic production – and integrating soil protection measures. This has been possible because cooperative members understand that they must cultivate sustainably to protect resources and add value to their products. Although only three years have elapsed as they changed the way to do this, the initial results have spread the way of sustainable agroforestry production to other farmers in the district and the province. Surrounding farmers have come to learn and experience, apply organic production methods to sell products to the cooperatives at prices higher than market prices.

With results of organic cinnamon production and cooperative growth, the cooperatives received loans with low interest from Governments' program to invest to machinery and technology of cooperative to improve quality and quantity of cinnamon and star anise products

2.4 IMPACT ON VULNERABLE GROUPS

When weather changes erratically, the difference between day and night temperature increases, water runoff increases and pollution of surface water affects the health of the people, especially the elderly and children and women. The effects of climate change are especially felt by poor or near-poor households, climate change makes their lives more difficult due to the high investment costs and the decline in income.

Among the many members of the cooperatives, female members and young people have been given priority to receive training on planting medicinal plants under the forest canopy, planting organic mulberry for a silkworm production and crafting handicrafts from cinnamon wood. The aim is to ensure that these vulnerable groups can cope with the changing climate.

3. THE BUSINESS AND FINANCIAL MODEL RESPONSE TO IMPROVE CLIMATE RESILIENCE

3.1 AGRO-ECOLOGICAL DIVERSIFICATION

After more than 3 years of establishment, the cooperative has been mostly focused on Vietnam's organic cinnamon and star anise value chains. Hence, the products have more stable production and output. But this stability now provides opportunities for product diversification within those value chains, and diversification through the development of other value chains. And this helps to incentivise ecological diversification in the region's agriculture.

The practice of organic farming opens many opportunities for diversification of plants (and associated fauna) in the forest landscape. The prohibition of using chemical pesticides brings practical benefits:

- Restoring forest ecosystems, while increasing the depth of the soil layers.
- Increasing the number of soil organisms, alongside increasing carbon storage in soils (reduces greenhouse gases).
- Increasing the ability to retain soil and water
- Increasing the number of economic options such as mulberry to raise silkworms, beekeeping, herbs, fruit trees, tea, bamboo shoots, etc. to diversify products under the forest canopy, to enhance biodiversity and forest ecosystems.

3.2 ECONOMIC DIVERSIFICATION

Producing organic cinnamon proved a good opportunity for the Vietnam Cinnamon and Star Anise Cooperative to expand its export markets. The Vinasemex Company provided financial support to issue an organic cinnamon certificate worth USD 2400 for 2 material areas with a total area of 913 ha of nearly 500 farmer households instead of 1.5 hectares of organic cinnamon at the beginning.

The cooperatives' members have contributed capital and borrowed money from banks to invest in buying processing equipment and drying cinnamon sprouts. Currently, the cooperative produces 12 products from cinnamon. The variety of products and complex processing has increased the value of products, improved profits and income for the cooperatives and its members. With the support and facilitating of Commune Farmers' Union, FFF and the cooperatives have also now founded several new collective and cooperative groups, such as beekeepers, mulberry growers, and herbal plant growers. Cooperatives also buy insurance for goods in stock to minimize damage if risks occur. These developments collectively enhance economic resilience.

Through reviewing and assessing the business potential of their cooperative and collective groups, the members have found that:

- Cooperatives have cinnamon wood that is often sold as low value timber. On the other hand, two members of the cooperative are already skilled in making handicrafts, and young members also want to learn handicrafts to do in their leisure time.
- The organic cinnamon hills of some of the members provide not only a clean environment, but also a beautiful landscape with cool lakes, plus a diverse culture, which is very suitable for tourism development.

Therefore, the cooperative has helped women and youth to start processing handicrafts from cinnamon trees. They have also founded an environmental services cooperative group. As these businesses develop, each member of the cooperatives does not only have income from cooperatives', but they have new sources of income from other business activities of collective or cooperative groups in DaoThink commune. In 2020, the cooperative is organizing training on planning skills and community tourism skills; organizing study visits, study the experience / community tourism craft villages in Ninh Binh province.

The cooperatives are committed to protecting the environment, and have initiated planning to collect waste, and develop waste treatment systems.

3.3 SOCIAL DIVERSIFICATION

The cooperative has established a strong social network of partnerships both within several important value chains such as cinnamon, star anise, honey etc., but also with local authorities and partners. These have served the members well.

These strong social networks have meant that, along with the community, the village authorities have established a cultural village convention so that the surrounding people do not use herbicides, chemical fertilisers and pesticides, to protect the ecosystem and organic cinnamon brand.

Every year, the cooperatives set aside a budget to train organic farmers, giving priority to female and young laborers; as well as giving gifts to poor households on Tet holiday. The Farmers' Support Fund and the Social Policy Bank have also lent money to 30 poor households in the commune. In this way, the cooperative has started to provide social and cultural services that will enhance its social resilience over time.

3.4 OTHER RESILIENCE MEASURES

Besides buying cinnamon from local producers at 20% higher than the market price, the cooperative stipulates to divide profits according to the proportion of contributed capital after deducting expenses. Through the work of the cooperative, the income of cooperative members has increased compared to the past and contributed to the local development, with an average income VND 4.5 to 6 million / month (US\$ 195-260) in 2019 – i.e. up to US\$3120 per year compared to an average of US\$ 1200 in the region. The percentage of poor households has decreased from 3% in 2018 to 2.53% in 2019. Members of cooperatives are insured which adds to their resilience.

Farmers feel proud of producing quality products, and of managing a flourishing forest and environment and they feel better health when they practice organic farming and reduce cost to buy medicines and health treatment.

The Cooperatives often organized trainings and applies internal control system (ICS) to maintain these standards. The cooperative's operation and organic cinnamon production creates big change for socio-economy life and environment protection for local leaders, people, and farmers. Also, cooperative groups produce other products in forests and farms have been established and are currently being invested in training by cooperatives.

3.4.1 PARTNERSHIPS

The cooperative has partnership relationship with a range of support of programs and agencies:

- They have a close partnership with Vinasemex Company for distribution and export
- They have received capital, training, and promotion from programs such as: National Target Program to build a New Rural Economy; Vocational training program for farmers in 1956 of Vietnam Government, OCOP program - One Commune One Product; and banks.
- They have received grant support and resources from local and foreign NGOs, such as FFF, Helvetas, Oxfam, and the Vietnam Organic Association (VOAA).
- They are building trust and relationships with farmers in the region.
- Their work has attracted local authorities to seek other support resources.

3.4.2 CLIENTS

Cinnamon has high value due to its many uses such as making medicinal herbs, spices, serving the industrialization of cosmetics and providing wood products. Cooperatives supply and manufacture a wide range of products. Most of these products are exported to markets of India; Middle East countries; and towards some more advanced markets like the US, EU, and Japan, and a few are sold domestically.

Table 2. Main products and their distributor and end market

Products	Distribution	Customers
Products from cinnamon		
Cinnamon tobacco pipes Cinnamon flutes Squares made of cinnamon Cinnamon split	Vinasamex Company	EU
Cinnamon powder ground from the bark: + Larger sizes than rice grains + With rice grain size + With fine dust particle size	Vinasamex Company	EU and Japan
Tea bag mixtures; cinnamon cigarettes; cinnamon powder AB; cinnamon sliced with bark; cinnamon with no bark; KBBC with cinnamon; cinnamon chopped; cinnamon powder jars; cinnamon sticks; aromatic cinnamon bags	Vinasamex Company	India; Middle East countries
Cinnamon leaves that are trimmed (not much - mainly pruning unqualified branches and leaves)	Members sell to Cooperative 6/12 at the same commune to make cinnamon essential oil	Domestic market
Cinnamon wood (This kind of product is mainly sold raw wood, now some of members has explored the market and learn how to process handicrafts)	Cooperative group produces handicrafts of the cooperatives	Developing team of workers, to toward domestic market
Other products		
Honey	Local markets, due to limited availability Family use for health care	Local people
Experiential tourism to cinnamon forest and farms, making waffles, cooking essential oils		Under construction
Planting medicinal plants on flat land and along cinnamon hillside	Traders	Domestic pharmaceutical companies
Silkworm raising, silk weaving (Due to the small number of these products at this stage, households in cooperatives sell their own products to diversify income sources)	Local traders	Domestic market
Tea, Fruit trees: pear	Experimental cultivation for Domestic market and self-consumption in every family	

3.4.3 COMMERCIAL STRATEGY

The cooperatives have offered the largest number of organic cinnamon products currently available in Vietnam with 12 cinnamon products and are developing other products from its forests and farms. Cooperatives' inspirational stories on quality products not only advertise effectively for human health but also protect natural resources and environment.

The cooperative Marketing Plan focuses on processed organic cinnamon product lines that are collected by Vinasemex and the company also introduces those products in international markets. The other products of the cooperatives are developed and tested by the cooperatives' cooperative groups for domestic consumption. During this cooperation process, Vinasemex and the cooperatives have

invested together and are in the early stages of effective cooperation (all products of the cooperatives are purchased by the company at prices higher than the market prices).

The products of the cooperatives have introduced through trade fairs and agents in Viet Nam and abroad. Up to the present time, products are priced higher than conventional products but have been accepted by the international and domestic markets.

4. CONCLUSIONS

4.1 MAIN CONCLUSIONS

From the case study of the Viet Nam Cinnamon and Star Anise Cooperative, climate resilience based on a profitable business model can evolve and diversify over time as the climate changes.

Main factors underlie the viability and success of this climate resilient model. We summarise these below:

- Recognizing the increasing of risks, and benefits of cooperation and building trust
- Willingness to invest in community engagement (to identify community production goals, and the main barriers including adverse effects of weather conditions).
- Identification of a shared production vision and SWOT analysis leading to the formation of groups, inter-collective group then cooperatives (including risk management).
- Business incubation to build staff capability within business organisations.
- Farmers' organization member training in market analysis and development and other skills continuously, and with ongoing coaching and facilitation by an overarching organization such as VNFU
- Production and business planning in the core value chain.
- Emphasizing product quality and diversification into new value chains and markets.
- Looking for and maximizing all local resources/ finances/ opportunities
- Implementing further production pilots, evaluation, lesson learned and replication.

Among these factors, perhaps the key point is strengthening the capacity of local farmer organizations in ways that enable them to add value to their products, diversify their products, and diversify into additional alternative value chains as key points to gain climate resilience.

The important role of the VNFU at local levels should not be underestimated in actively coordinating and linking FFPOs with enterprises, scientists, authorities/agencies, and financial institutions (Banks, support funds). The involvement of local authorities and related agencies/departments contribute greatly to the success of the cooperatives.

4.2 INVESTMENT CHALLENGES

Elements of change that have required most work to enable the FFPO to mobilise nature, finance, and partnerships towards a more climate resilient strategy are:

- Changing previous production habits and maintaining organic agricultural practices, because farmers would only see the specific effect of organic production after 3-5 years.
- Building relationships among actors in the value chain and relationships with authorities to mobilize available resources.

Every year, after accounting for profits, the cooperatives will deduct a few percent of the total profits to invest in a hedge fund to serve for reinvestment - with the high consensus of its members. Members understand that this fund will help them better deal with future risks and help their business and production be maintained and grown.

4.3 BENEFITS AND THEIR DISTRIBUTION

The practical benefits of climate resilience are enormous for the development of the cooperatives as well as the associated farmers (tree growers who supply the cooperatives), especially in the context of increasingly strong climate change.

The perceived practical benefits of climate resilience to the cooperative members and the associated farmers is shown in the table below.

Table 3. The practical benefits of climate resilience according to members of the Viet Nam Cinnamon and Start Anise Cooperative

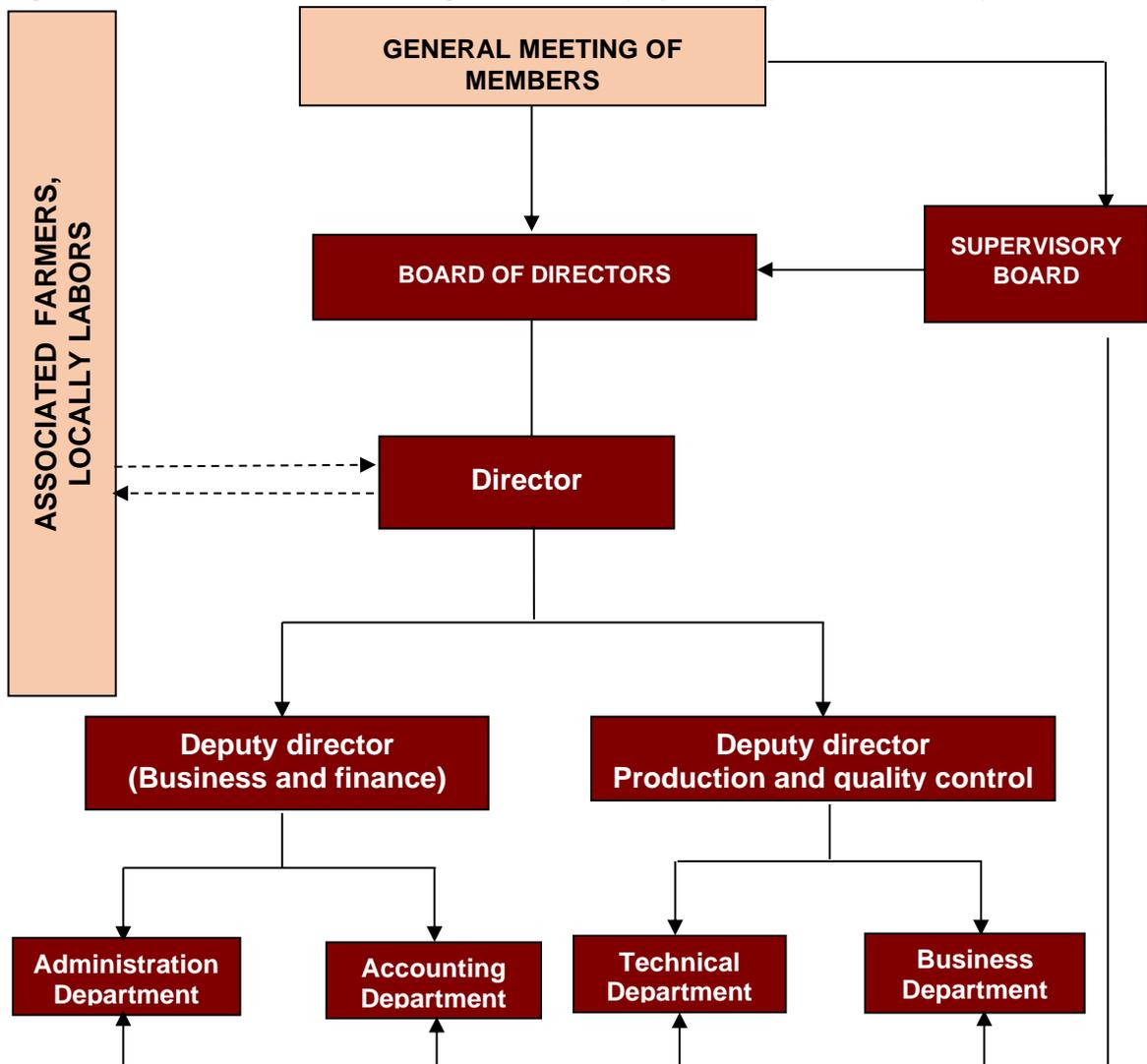
Climate resilience	Benefits to the cooperative members	Benefits to the associated farmers
More resilient agronomic methods (organic farming*)	<ul style="list-style-type: none"> ○ Keep yields increasing and stable ○ Reduce inputs cost ○ Have secure income ○ Have better support to overcome new threats like pests and diseases. ○ Add value to products ○ Stronger voice with local authorities 	<ul style="list-style-type: none"> ○ Keep yields increasing and stable ○ Reduce inputs cost ○ Have secure income ○ Have better support to overcome new threats like pests and diseases. ○ Add value to products
Diverse production options	<ul style="list-style-type: none"> ○ Help overcome economic downturns ○ Diversify income to ensure income during difficult time. ○ To have income sources while waiting to harvest products with a long cycle ○ Increasing the ability to reinvest for climate resilient and business. ○ Stronger voice with other actors in the value chain and local authorities. ○ Strengthening farmers' organization by number of members and cooperatives/ collective groups ○ Have more knowledge on sustainable agroforest farming and experience sharing ○ Have big volume of products and stronger negotiation power. 	<ul style="list-style-type: none"> ○ To overcome economic downturns ○ Diversify income to ensure income during difficult time. ○ Increasing the ability to reinvest for climate resilient and business. ○ Have more knowledge on sustainable agroforest farming.

The cultivation and processing of products in accordance with the quality standards of the target markets and the certification of organic products increase the most value for the cooperatives' products.

Organic farming has brought biodiversity and products diversity to farms and forests, and has made use of farm waste by-products, which has helped to significantly increase income by reducing input cost.

Annex 1 – Organisational diagram

Organization chart of the labour management and employment apparatus of the cooperative



Annex 2 – Leaf rollers cause damage to hundreds of hectares of production forests annually

