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Ecosystem-based adaptation (EbA) value chain analysis: recommendations for forest and farm producers in Vietnam

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Abbreviations

Agribank	Vietnam Bank for Agriculture and Rural Development
Biolabel	Collective biocultural heritage label
EbA	Ecosystem-based adaptation
EbA-FFPs	Forest and farm products produced using EbA approaches
FFF	Forest and Farm Facility
FGD	Focus group discussions
GMP	Good manufacturing practices
HACCP	Hazard analysis and critical control points
IFOAM	International Federation of Organic Agriculture Movements
IIED	International Institute for Environment and Development
ISO 22000	Food Safety Management System Certification
KIIs	Key informant interviews
MARD	Ministry of Agriculture and Rural Development
NAFIQAD	National Agro-Forestry-Fisheries Quality Assurance Department
NGOs	Non-governmental organisations
NTFPs	Non-timber forest products
OCOP	One Commune One Product programme
PGS	Participatory guarantee system
QR code	Quick response code
SWOT	Strength, weaknesses, opportunities and threats
THTs	To Hop Tac (collective producer groups)
VBSP	Vietnam Bank for Social Policies
VietGAP	Vietnamese Good Agricultural Practices programme
VNFU	Vietnam Farmers' Union

1. Introduction

1.1 Background and objectives

The project Scaling Up Community-Led Ecosystem-Based Adaptation in Biodiverse Forest Landscapes in Viet Nam is implemented by the International Institute for Environment and Development (IIED) and the Vietnam Farmers' Union (VNFU) and supported by the Global EbA Fund.[1] The project is implemented in five geographical areas: Bac Kan, Thai Nguyen, Son La, Hoa Binh, Yen Bai of the northern midlands and mountains. The overall goal of the project is to scale up the use of ecosystem-based adaptation (EbA) approaches by addressing the existing key barriers to knowledge exchange, market access and finance.

One of the project components is stakeholder engagement and a situation analysis involving key stakeholders, legal frameworks, value chain opportunities, market needs, opportunities and access to the application of a collective biocultural heritage label (biolabel) or Participatory Guarantee System (PGS) certification. This component will analyse and evaluate the value chains for forest and farm products produced using EbA approaches (EbA-FFPs) in the research area and to provide recommendations. The specific objectives are to:

- Provide an overview of value chains and value chains for forest and farm labels including PGS-certified products based on EbA and/or sustainability principles.
- Conduct a value chain analysis for each selected EbA-FFP in the research area, specifically including:
    - Identifying key stakeholders to support 25 forest and farm producer organisations (FFPOs) in the research area in capturing the benefits and value of EbA activities through innovative marketing using shared labels/PGS
    - Analysing the situation with the participation of key stakeholders
    - Assessing the current legal framework related to labelling for EbA-FFPs
    - Assessing market opportunities and demand for five EbA-FFPs value chains
    - Assessing opportunities and accessibility for local communities, farmers and businesses in implementing EbA principles and participating in the labelling initiative, and

[1] See www.iied.org/scaling-up-community-led-ecosystem-based-adaptation-biodiverse-forest-landscapes-viet-nam

- Synthesise the findings from the stakeholder engagement and recommendations for establishing labels/PGS for the five proposed value chains.

1.2 Project overview

This study focuses on the analysis of five EbA-FFPs value chains in 25 selected FFPOs in research area (Table 1). The project area is implemented in five provinces (Bac Kan, Thai Nguyen, Son La, Hoa Binh, Yen Bai) across 21 communes in 13 districts (Tran Yen, Yen Binh, Ba Be, Van Ho, Moc Chau, Thuan Chau, Phu Binh, Pho Yen, Phu Luong, Dai Tu, Dong Hy, Lac Thuy and Tan Lac). More than 85% of the area of the region is steep terrain, with 62% of the land area having a slope of more than 25 degrees and 16% having a slope of 15–25 degrees. It is a subtropical climate with four separate seasons (spring, summer, autumn and winter).

In addition to its rich biodiversity, the region was chosen because of its high vulnerability to climate change, high levels of poverty, and the existing Forest and Farm Facility (FFF) support for 41 local farmer organisations belonging to the Vietnam Farmers' Union (VNFU). Spanning 21 communes and 13 districts (Figure 1, Table 1), the total number of direct beneficiaries from the project is 11,580 (41.5% female, 61% ethnic minorities, 11.7% youth) and the total area of active agroforestry restoration is 41,069 hectares (Appendix 1).

Table 1. List of provinces, districts and communes/townships in the project area

Province	District	Communes/ Townships
Bac Kan	Ba Be	Yen Duong, My Phuong, Di Linh
Thai Nguyen	Phu Binh	Tan Khanh
	Pho Yen	Yen Tu
	Phu Luong	Phu Ly
	Dai Tu	Quan Chu
	Dong Hy	Van Han, Hop Tien
Son La	Van Ho	Tan Xuan, Van Ho
	Moc Chau	Dong Sang
	Thuan Chau	Long He
Hoa Binh	Lac Thuy	An Binh
	Tan Lac	Man Duc, Tu Ne, Thanh Hoi
Yen Bai	Yen Binh	Thinh Hung, Phu Thinh, Tan Nguyen
	Tran Yen	Dao Thinh, Tan Dong

Highland Indigenous peoples and local communities in this area are mainly farmers who operate farms on an average scale of one hectare. Highly dependent on the natural resources

of rainforests, rice cultivation, agroforestry production and forests, they are highly vulnerable to climate and other health and market risks. Viet Nam's National Climate Response Strategy, National Target Programme to Respond to Climate Change (NTP-RCC) and Viet Nam's 2018 Access to Resources Household Survey (VARHS) identify these social groups as highly vulnerable to the impacts of climate change. Threats include prolonged dry heat in summer; severe cold, damaging cold with salt fog in winter; flash floods, landslides, hail in the rainy season; and drought and severe lack of irrigation water in the dry season. These conditions especially affect very poor minorities, including women, children and the elderly.

Recovery from climate change losses often leads poor farmers to use intensive farming techniques that degrade the soil for short-term gains or encroach on protected areas in search of more land. This is putting increasing pressure on Vietnam's ecosystems. Degraded ecosystems further increase the vulnerability of local communities to climate change, forming a vicious cycle, as yield loss due to soil degradation leads to encroachment on natural forests, further eroding local ecosystem services and exacerbating the risk of soil erosion, landslides, floods and outbreaks of pests/diseases.

One of the main objectives of the IIED-VNFU project is to scale up EbA approaches though innovative marketing of forest and farm products that originate from landscapes managed by using EbA. The team identified 10 key EbA-FFPs-based value chains in the selected 25 FFPOs (see Table 2).

Table 2. Brief description of EbA-FFPs value chains in the 25 FFPOs

No.	Value chain name	Description
1	Vegetables	Including high-value, traditional and non-traditional vegetables such as broccoli, cabbage, oyster mushrooms, cauliflower, tomato, cucumber, eggplant, coffee, celery, bell pepper, zucchini, tomato, mushroom, bo khai. Crops are grown all year round.
2	Fruits	Including fruit trees such as red pomelo, orange, tangerine, pear, plum, peach, longan, banana, jackfruit, lemon, strawberry.
3	Natural bamboo shoots and bamboo shoot cultivation	Including types of bamboo shoots such as bando and luc truc bamboo shoots.
4	Medicinal plants	Includes all edible and medicinal plants that are grown or collected in the wild such as *Gynostemma pentaphyllum* and *Solanum procumbens*, velvet anise, cinnamon, star anise, *morinda officinalis*, perilla, purple cassia and ginger.
5	Honey and beekeeping under the forest canopy	Afforestation combined with beekeeping for honey under the forest canopy (including honey and beekeeping products).
6	Raising chickens under the forest canopy	Raising chickens under the canopy of planted forests (including all products obtained from chickens including chicken meat, chicken wings, chicken legs, eggs, whole chickens, herb-aged chickens).
7	Raising silkworms	Includes mulberry trees and silkworm cocoons.
8	Raising native pigs and pigs under the forest canopy	Includes all products obtained from pigs including meat and other by-products.
9	Raising cattle (goats, buffalo, cows)	Includes all products obtained from cattle including milk, meat and other by-products (leather and fertiliser).
10	Planting large-timber forests and protecting forests	Acacia, fatwood, rosewood, bodhi, eucalyptus, Canarium, bamboo forest protection.

1.3 Structure of the report

The research report consists of eight parts. Part 1 introduces the context and objectives of the report, an overview of the socioeconomic profiles of research area and describes the value chains in the 25 FFPOs of the FFF, the scope of the study as well as the content of the study.

Part 2 describes the theoretical basis and research methodology. The theoretical background section briefly describes the concept of the value chain as a specific context in which biolabels/PGS can make an important contribution to quality-assurance monitoring. This section also discusses concepts and basic principles of biolabels/PGS. In the research methodology section, the paper focuses on presenting the approach, analytical framework, method of data collection and analysis.

Parts 3, 4, 5, 6 and 7 present the research results for five selected EBA-FFPs value chains: medicinal plants, beekeeping, citrus fruits, vegetables and bamboo shoots. Each section analyses the following: value chain mapping for selected EbA-FFPs; analysis of the characteristics, roles and associations of actors in the value chain for selected EbA-FFPs (including producers, groups of agents providing input factors, groups of consumption agents); analysis of the management and support functions of off-chain actors for EbA-FFPs; and a strengths, weaknesses, opportunities and threats (SWOT) analysis of the value chain for the selected EbA-FFPs.

Finally, Part 8 presents a summary of the research results and recommendations that can be applied in practice to upgrade the 5 EbA-FFPs value chains for the 25 selected FFPOs in the research area. At the same time, it also affirms the contributions of research in terms of theory and practice as well as the limitations of the research and proposes a number of research directions.

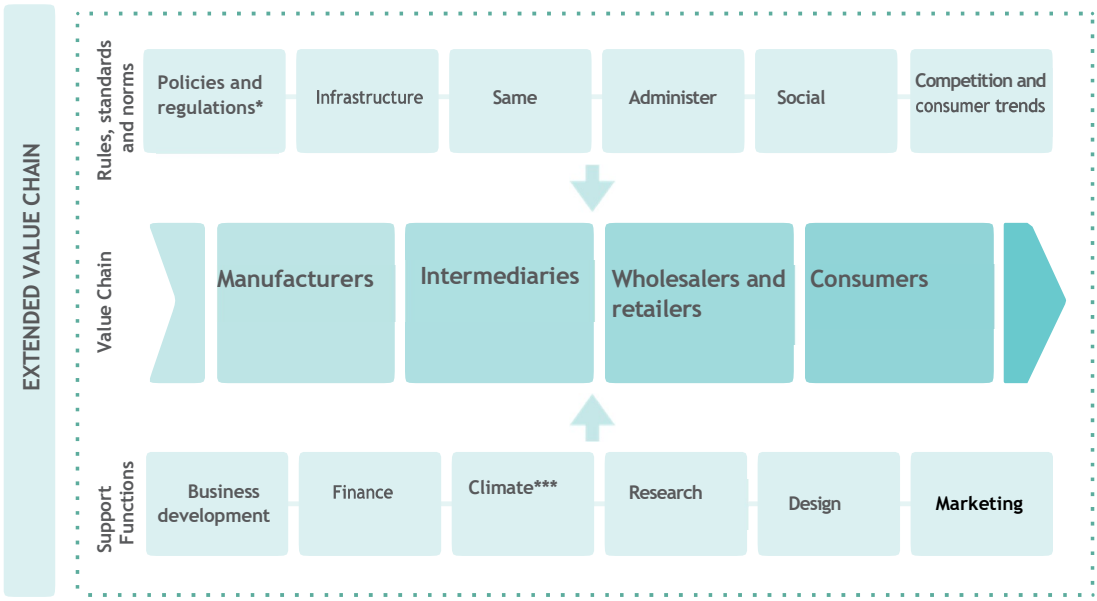
2. Theoretical basis and research methodology

2.1 EbA value chains for forest and farm products

A value chain consists of a range of activities required to bring a product from its inception to its end consumer, through a series of steps involving physical transformation and input of various producer services, and disposal after use (Kaplinsky and Morris 2000). In the context of agriculture, the value chain would be a set of actors and activities involved in bringing an agricultural product from production to final consumption, with value at each stage (Miller and Jones 2010).

By considering added value at all levels, the value chain approach considers production as one of the components, and therefore differs from the traditional monopoly focus on production (UNIDO 2009). An extended value chain consists of value chain actors and other binding components as shown in Figure 1, which illustrates an extended value chain that illustrates.

Figure 1. Illustration of an extended value chain



* This includes, but is not limited to, land and property rights, taxes and tariffs.

** This includes, but is not limited to, input providers and market information/trade information.

*** This includes climate conditions, including climate change, that can have an impact on the value chain. Source: Camagni and Kherallah (2014).

Value chains are affected by rules, standards, and norms including enabling environments and macroeconomic factors including policies and regulations (such as land and property rights, and/or taxes and tariffs); facilitating institutions (such as infrastructure and governance); and social norms (such as gender) that can shape the market environment. They are also affected by support functions/service that support value chain operations through financial, business, or agricultural extension services (Camagni and Kherallah 2014; UNIDO 2009), such as input suppliers, market information and quality-management systems.

Forest and farm products are commodities and resources derived from forest and agricultural land. These products cover a wide range of items, including but not limited to: timber and timber products, non-timber forest products (NTFPs), agricultural products, processed and value-added products, and ecosystem services. Forest and farm products play an important role in supporting livelihoods, providing essential resources for industries and contributing to the global economy. Sustainable management of forest and agricultural lands is needed to ensure the long-term availability of these products while preserving biodiversity, ecosystem function and the well-being of local communities.

Ecosystem-based adaptation (EbA) is an approach to responding to climate change by leveraging and protecting natural ecosystems to create resilience and resilience for communities and their habitats (see Box 1). Developing a labelling system that is based on EbA approaches in forest and farm production requires collaboration between stakeholders, including producers, processors, traders, policymakers and consumers. Forest and farm products based on EbA approaches (EbA-FFPs) can contribute to climate change adaptation, biodiversity conservation and sustainable development.

Box 1. What is ecosystem-based adaptation?

Ecosystem-based adaptation is defined by the United Nations Convention on Biological Diversity (CBD) as "the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people adapt to the adverse effects of climate change. EbA aims to maintain and increase the resilience and reduce the vulnerability of people and the ecosystems they rely upon in the face of the adverse effects of climate change. There are various interpretations of EbA, but all share the rationale of working with nature, and most converge on the principle of sustainable management, conservation and restoration of ecosystems, as part of an overall adaptation strategy".

The key principles of the EbA approach include:

- Integrating ecosystem services
- Enhanced resilience
- Sustainable resource management
- Using participatory and inclusive approaches, and
- Co-benefits for biodiversity and livelihoods.

Source: Convention on Biological Diversity (2018).

In order to sustainably organise the institutional structure of EbA-FFPs value chains, it is necessary to clearly define quality standards for EbA-FFPs according to target markets. The World Bank's study (2017) on international experience applicable to Vietnam suggested that, in the context of farmers and small enterprises in Vietnam, it is necessary to prioritise the adaptation of good practice standards for households and small-scale enterprises and develop domestic markets for products labelled as being produced using good practices such as organic products, Vietnamese Good Agricultural Practices (VietGAP), Good Manufacturing Practices (GMP), Hazard Analysis and Critical Control Points (HACCP) and ISO 22000: Food Safety Management System Certification. However, ensuring that voluntary quality standards are adhered to still faces difficulties such as difficulties in implementation with households and small enterprises; that it is relatively complicated to provide transparent information to consumers; and there are many standards and certification methods within different countries that hinder international food trade.

To solve the above difficulties for small households/enterprises, the solution is to encourage farmers to join cooperatives and associations to apply common standards and collective certification, with a system of participatory self-control of internal quality such as PGS. To solve the obstacle of information transparency, it is necessary to apply digital technology with digital platforms such as blockchain, which can help trace product origins with a larger amount of information than technologies using QR codes on websites. Traceability using digital technology can be deployed in modern distribution chains.

2.1.1. Role forest and farm producers in EbA-FFPs value chains

Forest and farm product value chains with majority small-scale family farmers based on EbA approaches are often built by all three main groups of actors: first of all, the actors directly participating in the chain (input suppliers, production, purchasing and processing actors,

distribution and trading actors, and consumers) and supporting actors such as the state, third-party certification organisations or communities in the private sector. Based on the research of Anh et al. (2020), the roles of actors in EbA-FFPs value chains are summarised in Table 3.

Table 3. The role of actors in the EbA-FFPs value chain

Actors	Role	Implementation content
State actors: ministries of agriculture and rural development, industry and trade, health, and science and technology	Creating the environment, institutions, policies and housing management in accordance with the law for the operation of EbA-FFPs value chains	• Develop institutional frameworks and policies related to EbA-FFPs • Implement EbA-FFPs risk management including risk assessment • Supervise, inspect and sanction EbA-FFPs • Acknowledgment, manage and supervise certification bodies • Build a laboratory system for quality analysis of EbA-FFPs. Train and guide the private sector in areas related to EbA-FFPs.
Third-party service organisations in value chains: certification and traceability services	Certification of bio labels/PGS standards for production and processing and business establishments	• Issuance of certificates according to EbA-FFPs standards • Inspection, monitoring, analysis of compliance regulations of the EbA-FFPs standards • Training facilities on EbA-FFPs and standards • certification • Provide traceability services according to GS1 international standards[2]
Key drivers in value chains: facilities providing agricultural inputs; agricultural producers (FFPOs, farmer groups, cooperatives, enterprises)	Producing EbA-FFPs	• Building a system of production practices that meet EbA-FFPs standards and register for EbA-FFPs standard certification • Building an internal quality control system (horizontal management). • Building and participating in EbA-FFPs management systems in value chains (vertical and horizontal management) • Building a traceability information system
Main actors in the value chain: wholesalers and retailers, enterprises processing and trading agricultural products	Processing and trading products while ensuring compliance with certification requirements	• Building processing and business establishments that meet the conditions of organic PGS/GAP and register with state agencies and certification organisations • Building a food-safety management system in the value chain through the signing of contracts with production facilities in accordance with the needs of consumers (vertical management)

[2] See www.gs1.org/standards

		Building a traceability information system.
Key drivers of the value chain: consumers	Consuming EbA-FFPs	• Purchasing EbA-FFPs with clear, sourced and traceable labels • Determining quality requirements that can be developed into standards

Source: Anh et al. (2020)

2.1.2. Building an EbA value chain for forest and farm products

Building an EbA-FFP value chain requires following certain steps to ensure the effectiveness of the value chain.

- Linking to form a sustainable value chain: this link involves cooperation between all actors in the value chain, ensuring economic sustainability through value sharing, and pursuing social and environmental sustainability. The operating mechanism in the value chain creates information transparency between actors, ensuring that actors in the value chain operate to minimise costs, ensure product quality and improve competitiveness in the market.
- Upgrading forest and farm product conditions based on the EbA approach at each stage in the chain, applying a quality assurance system, food safety (eg VietGAP, GMP, HACCP) and traceability systems (traditional/electronic); ensuring that information and knowledge on processes related to ensuring EbA-FFP safety and quality are widely shared and disseminated; and there is an appropriate monitoring mechanism to ensure that actors effectively implement technical processes.
- Training on production and business organisations according to production processes and quality assurance systems; implementing a traceability system; and registration for food safety certification such as VietGAP, GMP, HACCP and ISO 22000: Food Safety Management System Certification. These activities can be carried out within the EbA-FFP value chain with the support of relevant authorities. Training helps actors understand the processes and procedures in ensuring product quality and food safety in each stage of the value chain from the place of production to the consumer.
- Confirming the EbA-FFP supply chain: developing labels, traceability information and brands; communication and promotion of the EbA-FFP supply chain; handling arising issues, maintaining and expanding the EbA-FFP supply chain.

In the context of many small farmers participating in production, products brought to the market are mainly in the form of preliminary processing, without labels, with little connection to production organisation. Direct quality certification for each production household is

ineffective due to high costs, so farmers participating in cooperatives and certification should benefit from following the PGS method. The PGS certification system contributes to creating real sustainability in the value chain, especially the local value chain, through quality management at all stages in the chain such as input materials, production process, transportation, processing, packaging, and labelling. The quality and added value of products at each stage in the chain are ensured through the close commitment and responsibility of the actors participating in the system, helping consumers have confidence in the quality and safety of the products.

2.1.3. Participatory guarantee systems: an introduction

Participatory guarantee systems (PGS) are an internal quality assurance initiative developed since 2004 under the auspices of the International Federation of Organic Agriculture Movements (IFOAM). In Vietnam, the PGS system is implemented based on two sets of standards: Vietnam PGS Organics Standards issued by IFOAM in 2013; and Basic GAP (see section 2.1.4), a guide to vegetable production processes, issued by the Ministry of Agriculture and Rural Development (MARD) on 2 July 2014 (Decision 2998/QD-BNN-NT).

PGS is a subset of second-party certifications, where assessment of quality claims is made by peers within the group (who all have a vested interest in maintaining the label's integrity). PGS has gained popularity as a useful alternative to costly and administratively burdensome third-party certification systems (Nelson et al. 2016). PGS are 'locally focused quality assurance systems' (IFOAM), which are based on trust, social networks, knowledge exchange and the active participation of all stakeholders in the shared label value chain, including consumers and other producers.

PGS is applied as a participatory certification system for both organic production, safe production and any sector concerned with quality assurance and can be particularly useful for small-scale producers. PGS brings practical benefits to many stakeholders:

- For the distribution and retail system, PGS supports the connection of this system with producers of safe and high-quality products. As actors in the PGS system, distributors and retailers are directly involved in monitoring and sharing information on product quality. Retailers have access to reliable sources of quality products, thereby building trust with customers and increasing sales.
- For consumers, PGS provides the opportunity to use products manufactured according to standards that ensure reliable quality. PGS helps build consumer trust through direct

connections between buyers and sellers. Consumers have the opportunity to expand their understanding of the production process when they participate in the system, and can directly visit and learn about products right at the production site.

- For local authorities, PGS promises to be a reliable, low-cost but effective system to apply in the field of food safety and other forms of quality standard management nationwide.

PGS helps rebuild people's trust in their consumed products being produced to set standards. PGS contributes to changes in producer behaviour towards meeting market demands, while raising awareness of social responsibility, community connection and environmentally friendly production. Although having to adapt to local regulations, PGS systems still embody five core values and basic principles (IFOAM 2007):

- Participation (a prerequisite for building a PGS system)
- Shared development orientation (including production targets and operating methods of the PGS system)
- Transparency (clearly recording information, publishing and allowing access to the system database, thereby enhancing equality in the PGS system, which reflected in the organisational structure and collective responsibility of stakeholders)
- Trust, and
- Learning (principle for sustainable development of PGS system).

2.1.4. Good Agricultural Practices (GAP)

Good Agricultural Practices (GAP) are principles established to ensure a safe and clean production environment, whereby food must be guaranteed to be free of pathogens such as biological toxins (bacteria, fungi, viruses, parasites) and chemicals (residues of pesticides, heavy metals, nitrate content), and products must be safe from the field to use. GAP includes production in the direction of selecting locations, using land, fertilisers, preventing pests and diseases, harvesting, packaging, storage, field sanitation and product transportation. The aim is to develop sustainable agriculture that ensures food safety for consumers, safety for producers, protecting the environment, and tracing the origin of products. In the near future, producers and exporters of fresh fruits and vegetables who want to supply supermarket chains in Europe will have to prove that their products are produced according to GAP processes and many countries and regions will build their own GAP according to international standards when producing fresh fruits and vegetables.

In Vietnam, VietGAP standards are developed and issued by the Ministry of Agriculture and Rural Development. They are applied to products in the fields of cultivation, livestock and aquaculture. The four requirements in VietGAP for products in the fields of cultivation, livestock and aquaculture in general and clean vegetables in particular include:

- Standards on production techniques: Includes specific regulations on production techniques from selecting land, seeds and fertilisers to harvesting in accordance with specific regulations for each field of cultivation, livestock and aquaculture.
- Food safety: Includes measures to ensure that there is no chemical contamination or physical pollution during harvesting.
- Working environment: The purpose is to prevent the abuse of farmers' labour.
- Tracing the origin of products: This standard allows to identify problems from the stage of production to product consumption.

In short, products that meet VietGAP standards are products of good quality, ensure food safety and hygiene, do not use chemicals or substances harmful to the human body and the environment, are produced and harvested according to the correct process, and have clear traceability information for the product.

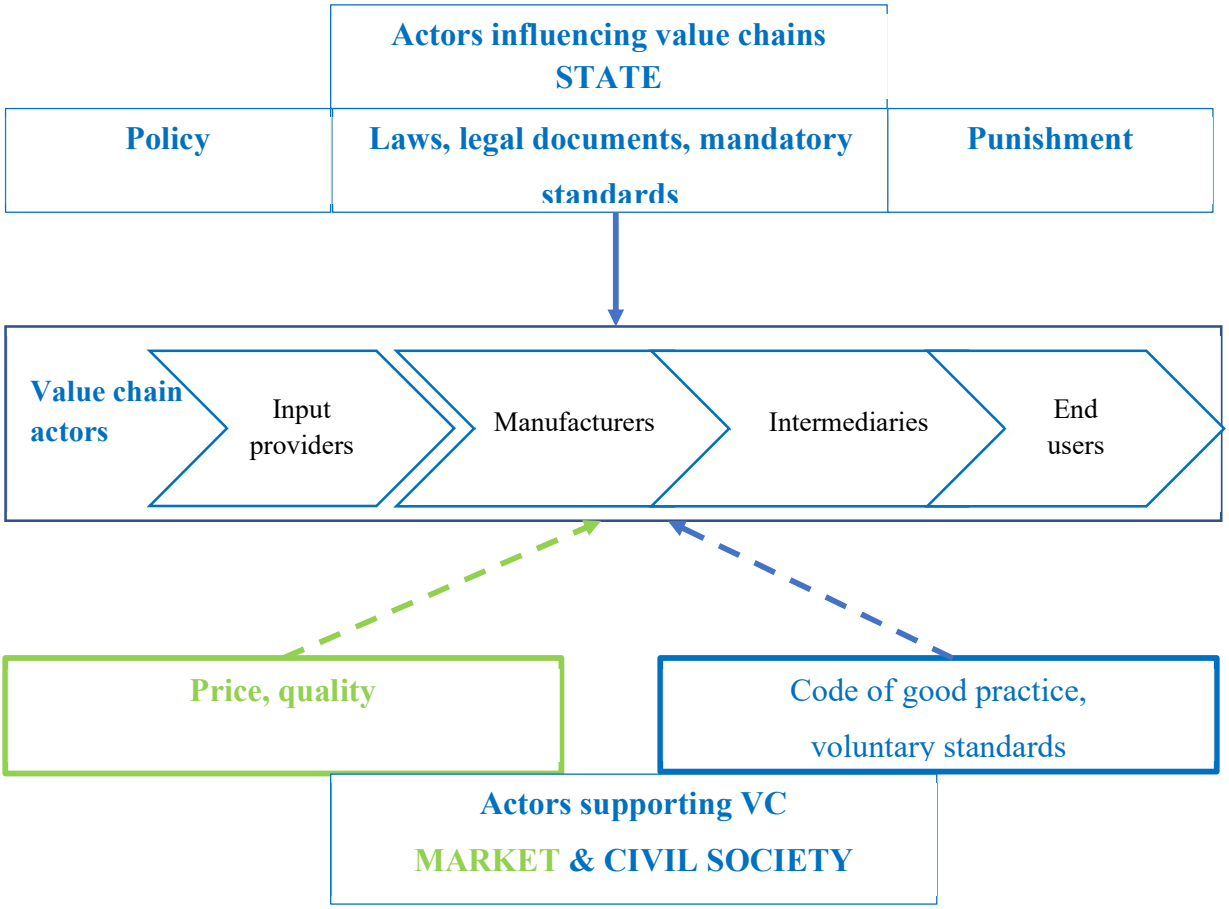
2.2 Analytical framework

The report approaches the issue to be studied from both inside and outside the value chain. The internal approach is based on the following groups of factors:

- Internal institutions of the value chain
- Operational mechanisms of the value chain, and
- Incentives and promotion tools to support actors participating in the value chain.

This approach allows the report to clarify the internal relationships between actors in the value chain that influence the EbA-FFP value chain. For an EbA-FFP value chain to operate, two frameworks are needed: the state's policy institutions and the value chain's management and coordination institutions. The state policy institutions (state actors) are created by the state, while the management institutions (or coordination) of the value chain are created and implemented by the market (private sector actors) and civil society organisations (families and communities) as shown in Figure 2.

Figure 2. Proposed research framework



The external approach is based on the role of the state and other actors who influence the value chain. Specifically, the state plays an important role in determining the formation and existence of EbA-FFPs with shared labels/PGS through the development of legal documents regulating the standards of shared labels/PGS; and establishing and operating a legal enforcement system. The role of market institutions (performed by individuals and compliance units) and the role of civil organisation institutions (performed by consumers and the community) for shared label/PGS products are:

- Supporting state management institutions in detecting and eliminating producers and actors circulating and processing products that do not meet the standards of shared labels/PGS, and
- Putting pressure on state management institutions to fully perform their roles and gradually improve the standards of shared labels/PGS and the monitoring and inspection system.

With this approach, the report will clarify how the stages in the value chain including input supply, production, collection, distribution and consumption are organised. It will identify which laws and practices maintain the relationships in each stage of the value chain, and identify the strengths and weaknesses of the value chains, thereby identifying the factors leading to success or failure, and the characteristics of successful and unsuccessful value chains.

2.3 Research methodology

2.3.1. Secondary data collection

In order to conduct a market analysis of the selected EbA-FFPs value chains, the following data is taken from the General Statistics Office of Vietnam, collected from websites related to EbA-FFPs such as the E-Agriculture newspaper; newspapers of the provinces, the populations in the target areas; production volumes at the national and regional levels; land areas exploited by agricultural holdings according to the type of land use; product prices in supermarkets and at cooperative farm gates; and trade statistics (import and export volume and price).

To analyse production volumes at the local level, statistics were collected from the reports of the departments of agriculture and of industry and trade in the research areas. To determine the availability of support programmes and the current situation in the grants collected, data on projects available in the research area were collected from the departments of agriculture, farmers' unions and women's unions. Information on the beneficiaries of these projects has also been collected. Data on agroforestry producers, certified organisations, and individuals is provided by the Vietnam Farmers Union, which provides organic certification.

The report has collated secondary information through primary sources such as: reports; policy documents of the government and of Bac Kan, Thai Nguyen, Son La, Hoa Binh and Yen Bai provinces; information from seminars, conference proceedings, books and newspapers; information from the internet related to biolabels/PGS based on EbA and/or sustainability principles; legal frameworks (applicable laws and policies related to forest and farm product labelling); value chain opportunities and market demand for the five value chains explored in this report for products with biolabels/PGS-certified (medicinal plants,

citrus fruits, vegetables, beekeeping products and bamboo shoots); market dynamics; consumer preferences; existing certification or labelling programmes in the industry to be able to declare EbA quality through labelling/PGS systems; opportunities and accessibility for local communities, farmers and businesses to implement EbA principles and participate in PGS/biolabelling initiatives; and potential allies and competitors for the establishment of the Cultural Biological Heritage label.

2.3.2. Primary data collection

During the main value chain research phase in April 2024, face-to-face and online interviews took place with representatives of the selected EbA-FFPs value chains. Both primary and secondary data were collected to complement each other. Primary data were collected using participatory value chain analysis (PVCA). PVCA is one of the main rapid evaluation methods used in value chain analysis, in which the assembly and analysis of information is carried out primarily by stakeholders in the chain with the support team acting as the facilitator (Bammann 2007). This is understood that with wider participation, solutions to value chain constraints are often more relevant to the local context, and when stakeholders understand and master the value chain development process, they are more likely to remain actively involved outside the project lifecycle.

Primary data was gathered using the following tools: focus group discussions, key informant interviews, and an analysis of strengths, weaknesses, opportunities and threats (SWOT analysis). The age range of those interviewed was between 26 and 66, with about half being over 45. Few farmers under the age of 30 were interviewed. All farmers interviewed were considered vulnerable, due to their limited access to finance, current poor living conditions, lack of academic knowledge and access to training courses, and low levels of income. For detailed information on conducted interviews (see Appendix 8). The process of selecting the value chains took place in early April 2024. Detailed value chain studies were carried out from mid-April to May. All activities were carried out in close cooperation with and with the support of VNFU.

Overall, the study applied a descriptive survey design methodology that used qualitative tools such as focus group discussions (FGDs) and key informant interviews (KIIs) with farmers in FFPOs to capture perceptions and constraints as well as preferred EbA-FFPs value chains. KIIs were conducted by targeting suppliers and input actors inside and outside the province, as well as buyers, traders, formal and informal financial institutions, processors, wholesalers

and retailers. Local management agencies and sociopolitical organisations such as the departments of industry and trade, the departments of agriculture, the forest ranger districts, farmers' unions and women's unions were also included as the main information providers. The aim was to better understand their expectations of quality and quantity for different products, financial models and value added, as well as the operation of formal and informal rules and regulations in specific value chains. The study included three phases (Table 4).

Table 4. Phases of the study

	Phase 1 Overview of policies related to EbA-FFPs value chains and evaluation the potential of these value chains	**Phase 2** Selecting target value chains	**Phase 3** Analysing the selected value chains
Action	Overview of policies related to the EbA-FFPs value chains Conducting mapping and prioritisation of value chains based on high-level assessment of the following aspects: economic, ecological, social, value gain potential (details in Appendix 3)	Based on the evaluation results of potential value chains, the team selected value chains for a detailed analysis in Phase 3	Further analysis and description of the selected value chains including: value chain mapping; analysis of key actors in the value chain; analysis of the management and support function of non-value chain actors, SWOT analysis. Recommendations made on development support activities for the selected value chains and priority areas for these (see Appendices 4, 5, 6, 7)
Sources of information	Key stakeholder meetings and interviews, literature review of available reports, statistical data	Production of Phase 1 report	Key stakeholder meetings and interviews, focus group discussions on targets, available reports, statistical data
Result	List of policy documents related to EbA-FFPs value chains Evaluation framework: evaluate potential value chains according to priority criteria	Value chains selected (focusing on specific products) for further analysis	Summary report including value chain evaluation and analysis results

The study used a multistage sampling technique to select districts and communes/townships. The districts were selected through purposeful sampling to target all project areas. Targeting also considers differences in geographic location or remote areas (proximity to towns and growth points) and socioeconomics. Commune selection was based on EbA-FFPs production areas. From each district, two communes were deliberately selected from each natural area. A total of 10 communes were selected for the study. In-depth interviews and focus group discussions (FGDs) aimed at FFPO leaders and farmer members in FFPOs were selected to capture their specific barriers, perceptions, priorities and to make recommendations to address the challenges identified for these priority groups for the FFF programme.

Individuals who did not participate in group discussions were selected for KIIs using structured questionnaires. The stratified sampling method was used to identify a total of 23 people from the list of the selected 25 FFPOs, targeting those who did not participate in the FGDS. This was followed by random sampling of six individuals for interviews and observation of key information providers in and out of the target geography of the research area to capture the supply and demand conditions for both input and output marketing that could be accessed and used by the project target group. These included remote input and output markets, financial services and other business development services that may be suitable for the project target group. Government officials in the research area, provincial/district promoters, women's unions, farmers' unions, forest ranger districts, cooperative alliances and others were also purposefully sampled for interviews to provide important information. Table 5 shows the number of people who participated in the KIIs.

Table 5. Number of in-depth interviewees

Province	**FFPOs**	**Other stakeholders in value chain (processing, sales, distribution, customers)**	**Other stakeholders (government, social work organisations, research/academic organisations)**
Bac Kan	9	Randomly selected after interviewing FFPOs	6
Thai Nguyen	2		3
Son La	3		7
Hoa Binh	3		7
Yen Bai	6		8
Total	**23**	**56**	**31**

2.3.3. Policy documents related to EbA value chains for forest and farm products

Policies related to ecosystem-based adaptation forest and farm product value chains (EbA-FFPs) have been issued by the Vietnamese government to ensure sustainable development and add value to forest and farm products while promoting ecosystem-based adaptation measures. Notably, the Agricultural Sector Restructuring Project (Decision No. 899/QD-TTg, 2013), approved by the prime minister on 10 June 2013, aims to improve the quality and value of agricultural products, including EbA-FFPs. This decision provides the foundation for applying food safety and quality standards across the agricultural value chain.

The production linkage policy (Decision No. 62/2013/QD-TTg, 2013 and Decree No. 98/2018/ND-CP, 2018) encourages linkages between production and consumption within the agricultural value chain. This policy promotes cooperation among farmers, cooperatives and businesses to enhance production efficiency and product quality within EbA-FFP value chains. The 2018 Decree supplements and clarifies voluntary linkage terms to increase the participation of various organisations and individuals in the value chain.

The Forest Protection and Development Law (Forestry Law, 2017), enacted by the National Assembly in 2017, provides a sustainable legal framework for forest resource management, encouraging local community participation in forestry activities. This law promotes sustainable forest exploitation and supports developing clear and traceable forest product value chains aligned with international standards, contributing to EbA-FFP objectives.

The National Adaptation Plan (NAP) 2020–2030, approved by the Prime Minister in 2020, focuses on ecosystem protection and enhancing community resilience to climate change impacts. NAP includes EbA measures, such as developing mangrove and watershed forests to reduce climate-related risks and support water conservation, in line with EbA-FFP value chain goals.

The Cooperative Development Project (Decision No. 461/QD-TTg, 2018), issued on 27 April 2018, supports developing cooperatives as a key component of agricultural value chains. With the objective of establishing 15,000 effective cooperatives by 2020, this policy strengthens cooperatives' roles in assisting farmers to participate in the EbA-FFP value chain.

The Food Safety Law (2010) and related decrees (Decree No. 38/2012/ND-CP and Decree No. 15/2018/ND-CP) are critical legal documents aimed at controlling food safety throughout the value chain. These regulations play an essential role in ensuring food safety and compliance with EbA-FFP production and processing standards, protecting consumer health.

Joint Circular No. 13/2014/TTLT/BYT-BNN-BCT issued on 9 April 2014 by the Ministry of Health, Ministry of Agriculture and Rural Development, and Ministry of Industry and Trade, promotes interagency coordination in food-safety management nationwide. This collaborative effort improves safety and quality oversight within EbA-FFP value chains.

Decree No. 55/2015/ND-CP on credit policies supporting agricultural development provides unsecured loans to enterprises, cooperatives and households participating in EbA-FFP value chains. With loan amounts covering up to 80% of project value, this policy facilitates concentrated production and enhances product quality in designated production zones.

Circular No. 27/2018/TT-BNNPTNT on traceability and quality control issued in 2018 by the Ministry of Agriculture and Rural Development mandates traceability for forest products, ensuring that all products have clear origins and comply with quality standards. This transparency strengthens the credibility of EbA-FFP products in both domestic and international markets.

However, while the current policy framework is comprehensive, there remains a gap in local-level support for EbA-FFP value chains. Given the interdisciplinary nature of the value chain, encompassing agriculture, forestry, industry, trade and health, policy implementation often lacks cross-sectoral coordination. Improvements are needed to synchronise policy execution, creating a conducive environment for the sustainable and effective functioning of EbA-FFP value chains in Vietnam.

2.3.4. EbA-FFPs value chain analysis

It is important to note that the analysis of EbA-FFPs value chains according to this task is conducted not only to identify the most beneficial value chains, but also to understand the limitations and opportunities for EbA-labelled products in existing market systems. Understanding these market drivers allows for recommendations on market-based solutions. To achieve this goal, the study adopted a participatory approach of data collection with participants through FGD and KIIs in identifying, selecting, prioritising and ranking value

chains for analysis. FGDs and KIIs with farmers in FFPOs were conducted to capture the perceptions, risks, limitations, opportunities and aspirations related to their preferred EbA-FFPs value chain.

2.3.5. Data processing and analysis

Regarding secondary information, the report applied the method of document monograph and policy analysis to include in the project's summary report. Regarding primary information, based on the current-status survey data and information-collection data tables, the report used the basic descriptive and comparative statistical methods to assess issues based on statistical data and analyse trends of the current status. However, there were some research limitations:

- There is incomplete statistical information at commune, district and provincial levels.
- There is not yet a complete database of farmers by location and EbA-FFPs.

2.3.6. EbA-FFP value chain selection

The first step of the study was to select income-generating EbA-FFPs value chains in the research area. For this reason, the team conducted a mapping of EbA-FFPs in the project target area. For this purpose, statistics were collected from data of the departments of agriculture and of industry and trade in the target areas. After completing the mapping of EbA-FFPs, the selection of value chain development was based on the following criteria: economic scale; growth prospects; social impact and inclusivity; and environmental sustainability (green potential) (see Appendix 3 for details). Based on the results of the evaluation conducted during the FGDs, the research team assigned a relative score from 1 (lowest) to 5 (highest) for each of the above criteria. By using the above criteria, participants (male and female) had an equal opportunity to score 1 to 5 for the most important EbA-FFPs that could be produced and marketed in their area. The highest grade-point average (GPA) was used to select EbA-FFPs for value chain analysis.

To score the EbA-FFPs along with the desk study, field research was conducted. The analysis was based on interviews conducted with stakeholders in the EbA-FFPs value chain. Moreover, interviews were conducted with the departments of agriculture, the departments of industry and trade, and VNFU experts to establish the trend and export potential of the agroforestry industry. Focus group discussions were conducted with 23 farmers in research area. The topics discussed were:

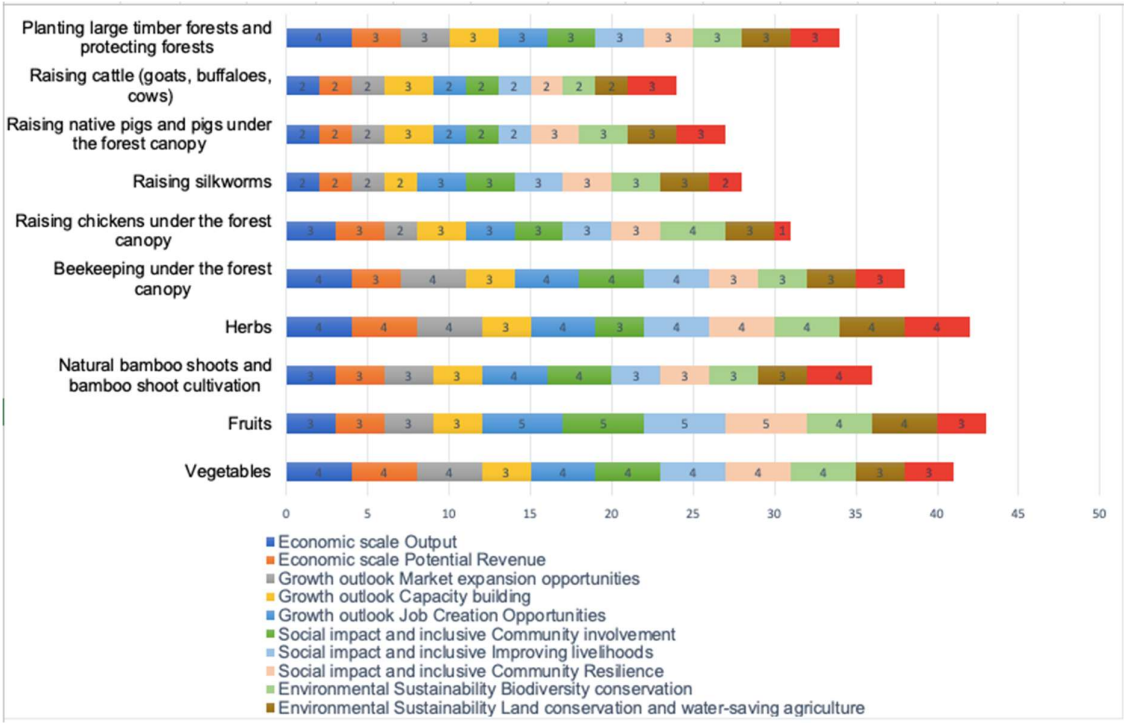
- Current situation of the FFPOs (emergence and development of the production system, main characteristics of each FFPO);

- Stages of the value chain (agroforestry production, input and supply, processing and packaging, distribution channels, marketing and sales) and linkages with other stakeholders (including relationships);
- Differences compared with conventional production systems;
- Perceived social benefits and impacts;
- Financial situation;
- Motivation and challenges (including engagement); and
- Future demand.

Detailed scores of each of the EbA-FFPs available in the target area are shown in Figures 3 and 4. The list of interviews conducted is given in Appendices 4–7 (FGDs and KIIs). The ranking results in Figures 4 and 5 show that there are five value chains with the highest average score from 3.27 to 3.91: medicinal plants, beekeeping under the forest canopy, citrus fruits, vegetables and natural bamboo shoots and bamboo shoot cultivation.

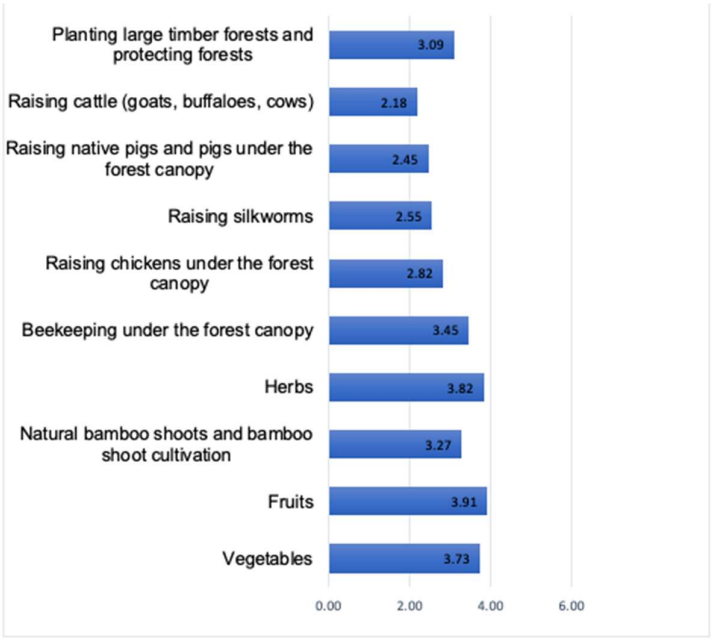
Once the value chains were selected, detailed research was done for each of them. First, desk-based research was conducted. This is followed by face-to-face or phone/ Zoom interviews conducted with representatives of each selected value chain. Value chain analysis included: value chain mapping; analysis of key factors in the value chain; analysis of the management and support functions of non-value chain actors; and a swot analysis.

Figure 3. Results of EbA-FFPs value chain assessment in research area



Source: Results of focus group discussions and in-depth interviews, 2024

Figure 4. Average score of EbA-FFPs value chain assessment in research area



Source: Results of focus group discussions and in-depth interviews, 2024

3. Value chain for medicinal plants in the study area

Medicinal plants are medicinal ingredients naturally derived from plants, animals, minerals and that meet medicinal standards. According to the Food and Agriculture Organization of the United Nations (FAO), the common term used to refer to medicinal plants is medicinal aromatic plants (MAPs), which are defined as medicinal plants that help people prevent diseases, maintain health or cure diseases (Marshall 2011). In other words, medicinal plants help provide nutrition, personal hygiene, body care, scent or cure human diseases.

Along with the rapid development of the pharmaceutical industry, medicinal plants today are used as raw materials in many areas such as the production of herbal medicines, functional foods, cosmetics, herbal medicines, the production of western medicines, herbal teas, traditional medicine, byproducts in the pharmaceutical industry, and the production of new drugs (De Silva 1997). Field surveys show that medicinal plants are currently being planted, collected, preliminarily processed and processed by FFPOs under the FFF project in the provinces of Bac Kan, Hoa Binh and Yen Bai. Medicinal plants are one group of crops for sustainable forest economic development. With favourable natural conditions, all provinces in the study area are famous for a variety of medicinal plants.

Each province has typical medicinal plants, including:

- Bac Kan province: *Curculigo orchioides Gaertn*, *Morinda officinalis How*, *Cinnamomum loureiroi Nees*, *Illicium verum Hook*.
- Thai Nguyen province: *Jasminum subtriplinerve Blum*, mistletoe.
- Son La province: *Polyscias fruticosa*, *Gymnema sylvestre*, *Amomum villosum*.
- Hoa Binh province: *Celastrus hindsii*, *Verbena officinalis L*, *Gynostemma pentaphyllum*, *Solanum procumbens Lour*.
- Yen Bai province: *Panax Vietnamensis*, *Eurycoma longifolia*, *Cinnamomum loureiroi Nees*, *Ardisia sylvestris Pitard*.

According to Lam Dong Department of Industry and Trade (2021), these plants are not only medically valuable, but they also contribute to the local economy through their collection and export. However, there are still a lot of untapped resources in the forests in the research area and due to the geographical location, there are a lot of wild fruits and medicinal plants. The cultivation and exploitation of medicinal plants in each locality is different, lacking synchronisation and linkage, so the full potential of this crop has not been fully utilised.

The survey results show that currently in the study area, planting medicinal plants under the forest canopy is underdeveloped. Households/cooperatives grow medicinal plants on a very small and sporadic scale, and there is no model of planting medicinal plants under the forest canopy on a concentrated scale. Within the surveyed areas, there are the most advantages in forests such as Ba Be district and Tan Lac district, but medicinal plants associated with forests are mainly exploited naturally, not focusing on zoning protection and cultivation.

Figure 5 shows the medicinal plant value chain in the research area, including the actors participating in the value chain, distribution channels and the level of distribution of medicinal products of the actors. In the value chain of medicinal plants, the production actors (farmer households, cooperatives) are the first actor to use inputs (seeds, fertilisers etc) to carry out planting, collecting, preprocessing and processing.

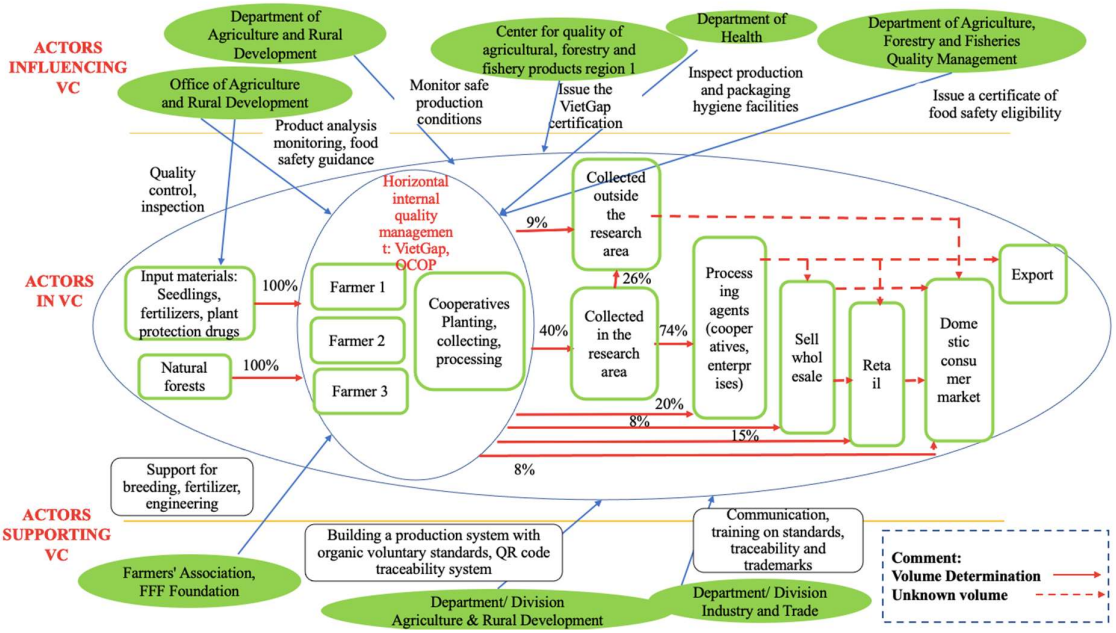


Figure 5. Map of the medicinal plants value chain for cooperatives in research area

Source: 2024 field survey data.

In agriculture, consumption channels refer to the ways agricultural products move from producers to consumers. These channels can be direct (such as farmers' markets and on-farm sales), or indirect (involving intermediaries such as traders, wholesalers, retailers and processors). When harvesting, medicinal plants are consumed through five main consumption channels:

Channel 1: Producers → Traders → Processors → Wholesalers → Retailers → Consumers: 37% of the medicinal plants produced by producers within the provinces is distributed through traders. Of this, 30% is distributed within the provinces and 7% is distributed outside. Because traders also collect products from producers outside the provinces, buying directly from these producers often does not guarantee the quantity, quality and time, so most medicinal plants are purchased through the collection actors in the province. The traders collect and sell to the processors to continue the production and distribution of the final medicinal product to the wholesalers, retailers and final consumers.

Channel 2: Producers → Processors → Wholesalers → Retailers → Consumers: 30% of the output of medicinal plants from producers is distributed directly to processing actors without going through the intermediate stage with traders due to the characteristics of the medicinal plants industry in Hoa Binh province. Yen Bai and Bac Kan often have processing facilities right in the province. The processors actors are cooperatives and enterprises. This group of actors purchases directly from cooperatives in stable quantities; most of them have sales contracts (agreements between farmers and buyers before harvest), so the purchase price is usually high and does not force down prices, unlike with traders/collection agents. Therefore, producers prioritise selling directly to processors first. However, producers sell less to processors than to traders, because not all localities have processing facilities. After the raw material input, the processors continue the production and distribution of medicinal products to wholesalers, retailers and end consumers.

Channel 3: Producers → Wholesalers → Retailers → Consumers: After the producers have harvested and processed medicinal plants to produce finished products such as herbal tea, 8% is distributed to wholesale actors. Wholesalers continue to distribute the medicinal products through retailers before the products reach the consumer market. The product is distributed mainly through retail channels.

Channel 4: Producers → Retailers → Consumers: 17% of the output of medicinal plants from producers is consumed through retail channels such as product introduction stores or store systems at tourist destinations and rest stops.

Channel 5: Production actors → Consumers: This channel only accounts for about 8% of the consumption, but it is quite common in the market for medicinal plants produced by

FFPOs in the study area. Producers can sell fresh, preliminarily processed or processed products and then sell directly to consumers at local markets, through acquaintances, at tourist attractions and on e-commerce platforms such as Shopee and Lazada. In this channel, the added value for the producers is the highest, but the consumption is the least.

In addition to the direct production and consumption actors in the medicinal value chain of FFPOs in the research area, there is also a group of indirect actors, playing a role in supporting and promoting the value chain such as associations, state management agencies, scientific research organisations, financial institutions and other intermediary organisations. These actors participate in the value chain through activities in the supply system, marketing, institutions, policies, research, finance and human resources.

Thus, the analysis of the consumption channel of medicinal products in the study area shows that most of the medicinal herb producers are farmers, often selling medicinal plants to collection agents (traders) to continue consuming products to the next intermediate level. The amount of product that producers sell directly to processors only accounts for 20%, the rest is still mainly consumed through collection intermediaries (49%), so the added value of the products they create is largely divided among intermediaries. Processors have not been strongly connected with producers to buy raw materials directly from them. Thus, if the medicinal herb value chain is operated according to the chain diagram of all participating actors, only the first and second consumption channels are formed as analysed above. Because there is no binding mechanism or profit-sharing mechanism among participating actors, and because product sourcing is not formalised/regulated, there is no way of systematically tracing back the product along the value chain to the producers from whom the agent sourced it from. However, using PGS certification, this would possible. Therefore, in order for the value chain to operate properly, achieve high efficiency, and bring benefits to all actors, it is necessary to have specific mechanisms to bind actors participating in the chain, thereby being able to develop the medicinal value chain in a sustainable way.

3.1 Analysis of factors in the medicinal plants value chain

3.1.1. Producers of medicinal plants: characteristics and roles

Medicinal plant producers (medicinal plant-cultivation facilities) are the starting point in the formation of the medicinal plant value chain, which plays the most important role in the production, distribution and consumption of products. If there is no producer, there will be no medicinal products on the market and there will be no flow of products to consumers. The socioeconomic conditions of producers are one of the important factors affecting decisions in production.

The results of the survey of medicinal plant producers in the study area show that the producers can be farmer households and cooperatives. The scale of the production area is relatively large, from 0.5 to 5 hectares/facility, equivalent to the area of forest land that farmer households manage. Establishments are linked together to establish cooperatives with an average scale of 10 hectares to 30 hectares. The median age of the facility owner was 44.3 years old; the education level is mainly primary level and most of them have more than 10 years of experience in growing medicinal plants (accounting for 71% of the total number of producers, the average number of years is 12.5 years). Thus, despite having the advantage of large areas of available land, being able to expand the scale of medicinal plant cultivation and many years of experience in medicinal plant production, the limitations of the low qualifications and high ages of the facility owners have directly affected their decisions in the production of medicinal plants. Many have a more cautious approach to markets and use traditional farming techniques and many chemical inputs that cause unsafety (25.56% of households use common pesticides). Their harvesting and post-harvest techniques are also still outdated (32.78% of households do not store post-harvest products correctly).

3.1.2. Medicinal plants produced

Through a survey of medicinal plant producers (farmer households, cooperatives) in the research area, it was found that the research area is currently very rich and diverse in terms of the number of medicinal plant species, especially natural medicinal plants. However, the group of medicinal plants that are being grown and developed as commodities is divided into three groups:

- Perennial medicinal plants grown under the forest canopy, which have a growth time of more than one year to harvest products, including the following: *Gynostemma*

pentaphyllum, *Morinda officinalis How*, *Amomum villosum, Cinnamomum loureiroi Nees, Curculigo orchioides Gaertn, Millettia speciosa Champ* and *Fallopia multiflora*.

- Perennial medicinal plants not grown under the forest canopy, which have a growth time of more than one year to harvest products and are usually planted and exploited in mixed gardens and high hilly areas, including the following: *Celastrus hindsii, Polyscias fruticosa, Plukenetia volubilis L* and *Stephania Glabra*.
- Annual medicinal plants, which have a growth time of less than one year to harvest products, and are usually planted in fields and low-lying areas, including the following: *Solanum procumbens Lour,* turmeric, *Cymbopogon citratus,* ginger, *Gymnema sylvestre* and *Illicium verum Hook*.

Medicinal plants in the study area currently have two main sources of seeds: those that are saved by farmers themselves from the previous crop or are bought, or supplied by programmes and projects. However, due to traditional farming practices and long-term experience of producers, the choice to buy medicinal seed varieties to put into production in the research area is not timely nor has been paid attention to.

Varieties chosen are mainly trees such as *Solanum procumbens Lour, Celastrus hindsii* and *Gynostemma pentaphyllum.* These are easy to grow and easy to breed thanks to their suitability to the climatic conditions of the cultivation area. They are mainly grown from seeds, bulbs or cuttings. Farmers tend only to buy these seeds for the first year's crop. After that, 90% of seed used is seed saved from previous crops. For other medicinal plants such as *Curcuma longa L,* ginger, *Cymbopogon citratus, Polyscias fruticosa*, seed saved from previous crops accounts for about 60% (these types of self-seeding plants usually give lower yields due to breeding and degeneration).

Varieties that are brought or supplied by project programmes usually include plants such as: *Cinnamomum loureiroi Nees, Illicium verum Hook, Ardisia Sylvestris Pitard* and *Panax pseudoginseng*. Most of these trees are new varieties put into planting, having undergone processes of testing and developing, so the main source of seeds is provided by the Provincial Farmers' Association.

3.1.3. Production processes for medicinal plants

In order for medicinal plants to be grown that are high yield, high quality and with high medicinal properties, proper care and pest control is very important. According to the production process of medicinal plants, to ensure the highest safety and medicinal properties of raw materials, producers need to ensure the right technical requirements. The results of the survey of medicinal plant producers in the study area highlight the following:

- **Irrigation water sources:** Due to the topographical characteristics of medicinal plant growing areas, which are often high mountains and strongly divided, the ability to provide irrigation water is mainly based on natural conditions. About 20% of the growing area is irrigated with water taken from small streams in the forest; the rest is rainwater. In addition, the terrain of the medicinal plant-growing area is either often relatively steep or terraced fields, so it is relatively easy to drain water.
- **Fertiliser use:** Through field observation and in-depth interviews, the research team found that the fertilisation process used by medicinal herb producers currently is not very scientific. Only 65.21% (15/23) of the producers surveyed have been trained in fertiliser application. More than 21.7% (5/23) follow the manufacturer's instructions and 13% were arbitrarily applying fertiliser according to their own experience or the experiences of surrounding households.
- **Use of pesticides:** Thanks to training on the safe use of pesticides at agricultural extension classes, most producers understood the four correct principles of pesticide use: using the correct pesticides, with the correct dosage and concentration at the right time and applying them properly. Study survey data show that the medicinal plants in general have fewer pests and diseases, if any, and at levels lower than those of other vegetable plants. Therefore, the level of use of pesticides is also less than that of other crops, so medicinal products have a higher level of safety. In the process of using pesticides, the vast majority of producers use the right dosage of pesticides as recommended by pesticide stores and agents located in the study area. However, the use of safer-to-use biological pesticides suitable for medicinal plants is not yet widespread (only about 70% of producers use them) and there are still about 10% of producers using pesticides that do not comply with safety principles when harvesting products earlier than the pesticide manufacturer's regulations. This will also greatly affect the safety and medicinal properties of medicinal materials after harvesting.

The current form of production organisation of medicinal plants in the area (planting, collection, preliminary processing, processing and preservation) is mainly done by individual

FFPO-member households. Because planting and collecting medicinal plants is mainly done by single households, the size of the area per farmer household fluctuates depending on the size of the land owned by the household and the type of crops they grow. With the group of medicinal plants planted under the forest canopy, the production area is relatively large from 0.5 to 5 hectares/facility. Medicinal plants such as *Cymbopogon citratus*, turmeric, *Solanum procumbens Lour*, *Gymnema sylvestre* and *Celastrus hindsii* are grown at a small scale, from 100m to 5,000m2/facility. FFPOs tend to have an average land area of 10 to 30 hectares, the practice of farming is usually to manually harvest plants from natural forests, with the average annual sales output about 4 tonnes of dried product.

The preliminary processing, processing and preservation of medicinal products done by cooperatives in the research area is still at a simple and rudimentary level (Table 6). The cooperatives collect from local farmer households. Most products are preliminarily processed (for example dried, roasted) using manual equipment and preserved in plastic bags or deeply processed to create value-added products such as tea and essential oil products at the FFPO headquarters and then sold to markets inside and outside the province. Medicinal plants are an ideal crop in all provinces/districts of the project area because they survive in very harsh weather conditions and grow well under the forest canopy, increasing income for FFPO members (Box 2 presents a typical livelihoods model).

Box 2. Ta Anh Cooperative: a forest-canopy livelihoods model using EbA

The FFF forest-canopy livelihoods model in Ta Anh Cooperative is designed to support local communities, particularly farmer households and FFPOs, in establishing sustainable livelihood activities under the forest canopy. This approach not only provides economic incentives for local forest producers to maintain long-term forest stands but also enhances EbA to help tackle climate change impacts. By stabilising soils and protecting water resources, the model contributes significantly to local climate resilience and offers higher economic returns through the production of mature timber and diversified forest products.

For instance, planting and harvesting medicinal plants such as ba kich, ngoc linh ginseng and dinh lang under the forest canopy leverages the forest environment and regional climate. Additionally, raising honeybees under the forest canopy enhances honey yields and improves household incomes. These practices highlight the environmental and adaptive qualities of

EbA, which can be showcased in marketing, labelling and certification through Participatory Guarantee Systems (PGS), providing added value and recognition of forest products.

Before the FFF project, cooperative members primarily planted fatwood with a five to six-year exploitation cycle. Through the FFF project's support, members shifted from conventional afforestation to large timber afforestation, establishing areas eligible for FSC certification to increase forest value and community income. Ta Anh Cooperative invested in nursery development to improve seedling quality. However, achieving forest certification requires 7–10 years, presenting an income gap that may prompt early forest sales in challenging times.

Since 2021, with FFF project assistance, Ta Anh Cooperative has developed an EbA-based livelihood model under the forest canopy to supplement member income. By integrating EbA principles, they expanded the planting area for the medicinal purple *sa nhan tim* (purple amomum) from 0.6 hectares in 2021 to 1 hectare by 2023. This model enhances forest ecosystem resilience and aligns with EbA values, strengthening the cooperative's offerings through sustainable practices that support both ecological health and economic stability.

Source: Interview with Ta Hoang Anh, director of Ta Anh Cooperative, 2024.

Table 6. Processing methods for main medicinal plants in study area

Type	**Preliminary processing method**	**Processing method**	**Infrastructure and Implementing organisations**
1. *Solanum procumbens Lour*	Mechanical processing: Removing damaged plants Drying or taking fresh stems and leaves	High-temperature cooking, tea bag filter, powder	Nursery: yes Gathering and preservation area: yes Organisation: cooperatives combined with households
2. *Gynostemma pentaphyllum*	Mechanical processing: Removing damaged plants Drying or taking fresh stems and leaves	High-temperature cooking, tea bag filter	Nursery: yes Gathering and preservation area: yes Organisation: cooperatives combined with households
3. *Amomum villosum*	Manual processing: Removal of damaged fruits Drying	Not yet available	Nursery: not yet Gathering and preservation: not yet Organisation: household-level production only

4. Ardisia Sylvestris Pitard	Manual processing: Removal of damaged leaves Drying or taking and leaves	Tea bag filter	Nursery: yes Gathering and preservation area: yes Organisation: cooperatives combined with households

The support of local agencies such as farmers' unions, women's unions, cooperative alliances and FFPOs in the research area has created a strong community connection network, creating opportunities to share knowledge, production and business experience and connect potential markets. Female members are supported through job creation, capacity building and strengthening the voice of women in the family and FFPOs. In this sector, most of the activities such as harvesting, cultivation, cleaning, sorting, and drying are largely undertaken by women.

However, producers also face challenges, such as lack of proper technology for harvesting, modern drying and storage technology. Besides harvesting, preliminary processing and processing, in order for medicinal plants to always maintain their quality, the preservation stage is also very important. The requirement to retain their form, value and keep their medicinal properties intact as when they were fresh plants. When storing, it should be noted that strong light will cause the plants to lose colour or change brown, while any temperature increases will speed up the chemical reactions in the medicine, helping mould, insects, worms, weevils and other pests and diseases to develop. The results of the experimental investigation show that there are still some surveyed farmer households who are preserving preliminarily processed materials that are not properly processed according to the specifications and technical processes required. This is very easy to adversely affect the quality of medicinal plants during the next processing stages.

Box 3. Tan Lac Son Cooperative

Tan Lac Son Cooperative grows *Gynostemma pentaphyllum* (also known as jiaogulan) on an area of 30 hectares in the rocky mountainous area of three communes: Phu Cuong, Phu Vinh and Lu Son. Tan Lac Son Cooperative actively guides farmers to practice sustainable production, focusing on responsible harvesting techniques from harvesting to leaving roots and seeds, creating conditions for natural regeneration of the *Gynostemma pentaphyllum* tree. The production process of Tan Lac Son Cooperative is systematised, from the purchase of fresh materials, meticulous screening of input materials, to preliminary processing and

packaging of the final product. The annual sales volume is about 4 tonnes of dried product, generating an income of about 480 million Vietnamese dong (equivalent to around US$19,100).

The *Gynostemma pentaphyllum* tea product of Tan Lac Son Cooperative is recognised as a One Commune One Product programme (OCOP) product at the request of the sub-department of the National Agro-Forestry-Fisheries Quality Assurance Department (NAFIQAD) and is working towards organic PGS certification but has not yet been certified. The problem of Tan Lac Son Cooperative is that it has not diversified its products, with only two product lines: half-kilo packaged *Gynostemma pentaphyllum* tea and *Gynostemma pentaphyllum* tea bags.

Tan Lac Son Cooperative has approached many different markets such as Hanoi, Da Nang, Quang Ninh, Thanh Hoa, An Giang and Ho Chi Minh City. Tan Lac Son Cooperative also actively participates in trade fairs. Customers of Tan Lac Son Cooperative are online customers, local customers who come to buy directly at production facilities, small shop owners, self-selling wholesalers, and distributors. Tan Lac Son Cooperative has built a website to promote and sell its products and reaches out to potential customers effectively through social networking platforms such as Facebook and Zalo. The largest sales revenue comes from sales to wholesalers and distributors. However, for customers who are wholesalers and distributors, Tan Lac Son Cooperative does not have a form of managing this distribution channel.

Source: In-depth interview with Mr. Le Van Hiep, director of Tan Lac Son cooperative, 2024.

3.1.4. Linkages in the value chain for medicinal plants

Horizontal linkage between producers: Mainly production households are linked together through the exchange of workers, buying inputs together, gathering outputs when there is a large consumption relationship, and forming interest groups or FFPOs/cooperatives. However, over 50% of households participating in the study said that these horizontal linkages are still simplistic, spontaneous and less effective, and the groups that have been established have not been able to cover all the outputs for members of the FFPO.

Vertical link between producers, traders and processors: Survey results show that more than 24.4% of producers have strict agreements with cooperatives and traders on product

prices and stable output consumption by contracts. The remaining 75.6% have admitted to participating in this vertical link, but the agreement is oral or non-contractual and spontaneous, and transactions are only carried out when purchasing products. Although there is an agreement by contract, there is still a common situation of people breaking contracts to sell elsewhere when the market price is higher (nearly 48% of producers participating in the association). In addition, even businesses that have signed a contract to purchase products often do not purchase because there is no market to sell on the products.

3.1.5. Input factors

Input factors include the labour market for the production and harvesting of medicinal plants; those providing input materials used in production such as fertilisers, pesticides and other production tools, including local agricultural material supply agents; and state management agencies such as departments of agriculture, agricultural extension, plant protection, forest rangers that provide knowledge about production organisation, technology, techniques and markets.

Over 85% of producers use manure for top dressing in the production process and are aware of the benefits of using manure for soil and crops. The level of use of manure depends on the conditions of each household and each type of medicinal plant. However, the trend of using manure to fertilise medicinal plants is decreasing due to decreasing livestock production and because the transportation of manure takes more effort and time than other types of fertilisers, such as inorganic fertilisers for medicinal plants, which are becoming more and more popular in many localities, especially for annual medicinal plants. The most commonly used inorganic fertilisers today are synthetic NPK fertilisers and nitrogen fertilisers used by more than 45% of surveyed farmers, which greatly negatively affects the soil quality and medicinal properties of medicinal plants. Although considered safe and very suitable for medicinal plants, eco-friendly microbial fertilisers have not been widely used in medicinal cultivation (about nearly 32% of farmers surveyed) mainly because the cost of this fertiliser is high (1.5–2 times more than other fertilisers) and people do not have much information about these fertilisers.

Field surveys show that in 2023, the FFF project has provided support in terms of seedlings, organic fertilisers and training in medicinal plant planting techniques for FFPOs in the research area, supporting Tien Thanh T&T Cooperative (Yen Bai) with *Ardisia Sylvestris Pitard* and *Cinnamomum loureiroi Nees* seedlings, fertilisers for plants, and training classes on techniques for growing medicinal plants. FFF has also supported Ta Anh Cooperative in

My Phuong Commune, Ba Be District, Bac Kan with *Amomum villosum* planted on an area of three hectares and star anise varieties on 15 hectares.

In addition, the provincial farmers' unions supply microbial fertilisers and seedlings. Currently, only one private trader, Phan Sam Mao, provides purchasing services for raw medicinal products. Local authorities also support this transformation effort. However, to meet the demand for seeds, cooperatives purchase seeds from suppliers in other provinces, such as Lang Son, though specific criteria for seed selection have yet to be established.

3.1.6. Actors in the medicinal plants value chain

New consumer trends open up new opportunities, promoting a potential market for the field of medicinal plants. After the global pandemic, it is not surprising that consumers are becoming more and more health conscious, further promoting the trend of purchasing products that are 'back to nature'. This offers great opportunities for producing and selling personal care products made from natural ingredients. Currently, actors consuming medicinal plants include local and non-local traders, processors, wholesalers and retailers. FFPOs have not been able to access the international market for export.

Commercial agents (traders)

Collection agents/traders play a key role in the value chain, collecting medicinal plants from producers and distributing them to other stakeholders. As the initial link between producers and the market, traders bridge the gap between herb growers and various buyers. Given the complexity and broad scope of the value chain, the project's research focuses only on collection activities within the study area. Here, two main types of collection agents are identified: cooperatives (which operate as collective gathering groups) and individual traders who work independently. Typically, these agents are located in favourable geographical areas, such as homes near main roads or close to medicinal herb cultivation zones, allowing easier access to raw materials.

The survey results show that the majority of FFPOs sell raw products to local traders who then transfer these raw products to other places. In this case, the majority of FFPOs in the study area did not track where their products went. However, through studying the literature and based on the research data of Thu (2022), the main consumption channel for traders is selling to processors in the province (74%) and reselling to other traders outside the province (26%). Thu's report shows that, although the consumption channel for medicinal plants

outside the province only accounts for nearly a third of the output of traders, it brings higher profits than consumption through channels in the province for processors. However, in order to sell outside the province, traders must have a large capital and the means for long-distance transportation, combined with relationships in major markets such as Hanoi, Quang Ninh, Hai Phong. In addition to the advantages of medicinal plants of the provinces in the diverse and available research area, the current medicinal herb traders still face many difficulties due to the small scale of operations, that their relationships with producers are not close or frequent, so traders also face many risks when prices and markets fluctuate. Consumption of medicinal plants is still mainly dependent on intermediaries who do not also have legal status, so it is difficult to connect to supply raw materials to large pharmaceutical companies.

The survey results also show that the traders collecting medicinal plants in the study area were quite young, with an average age of 37 years and an average of five years of experience in the profession. The obvious feature of the group of traders is that they operate professionally and regularly, in any season, not only collecting medicinal plants. Currently, medicinal plants are often purchased right in the farmers' fields or purchased at some gathering locations that have been agreed in advance with producers (when farmers are cooperative members). When the amount purchased is not exhausted, with some medicinal plants that can be preliminarily dried such as *Celastrus hindsii, Solanum procumbens Lour, Gynostemma pentaphyllum, Ardisia Sylvestris Pitard,* the producer will preliminarily process and store them at home, ready for collection when needed. The purchase price is usually agreed upon by the traders within the regional limit to limit the large price difference between the agents. The form of procurement is mainly through oral agreement with prices agreed through direct negotiation (80%), immediate payment in cash when buying and selling, with products often priced according to product quality and market availability.

Linkages in the value chain:

- Horizontal linkages between traders/collection agents: 100% of traders think that these linkages are not strong because they themselves have competition in terms of price, input supply areas and distribution markets for medicinal materials.
- Vertical linkages between traders and processors: These are based on long-term trading business relationships or referrals from partners. Although usually only verbal agreements, 100% of participating traders saw these linkages as tight and ensuring harmonious interests between parties with personal prestige, trust and deposit.

Processors

The current medicinal herb processors in the research area are mainly cooperatives, enterprises and establishments registered for processing. Medicinal plants are also processed into herbal remedies by healers (typically Bui Van Phuong and Nguyen Sinh Chau in Yen Thuy district, and Dinh Thi Phien in Hoa Binh city) and by households, who process them into dried medicinal plants for sale. However, the design, appearance and quality of processed medicinal products still need to be upgraded and improved, especially high-form products and tea bags. A number of processed medicinal products have been recognised by the provinces in the area with three and four-star OCOP certification and are present in many provinces and cities across the country such as *Solanum procumbens* instant tea, *Solanum procumbens* tea bags, *Solanum procumbens* condensed root extract, and *Celastrus hindsii* extract.

The results of the field survey show that some FFPOs sell direct to processors. For example, Generic Pharmaceutical Joint Stock Company (Hanoi) is one of the largest companies purchasing from cooperatives producing medicinal materials in the research area. Specifically, in 2023, Generic has purchased 500–600 tonnes from cooperatives growing medicinal plants in Ba Bei district, Bac Kan. Generic is the most important agent in this value chain, managing both the price as well as the quality of the product. Farmers are expected to adhere to the quality standards set by Generic, acting as both buyers and regulators.

Linkages in the value chain:

- Horizontal linkages between processors: 100% of processors participate in this linkage. They are from the same locality, so they still maintain and develop this linkage to support each other in the processing refined products, especially sharing experiences, and introducing input and output partners of medicinal products. All think they have competition with each other for development, especially in terms of technological innovation.
- Vertical linkages between processors with wholesale and retail: Over 74% of processors have signed contracts with wholesalers to ensure the quantity and price of products. The rest are mainly linked by oral agreements, guaranteed by personal prestige, trust and deposits.

Wholesalers and retailers

Just like traders, wholesale and retail agents are those involved in the transportation, distribution and consumption of medicinal materials:

- Wholesalers act as an intermediary to bring medicinal products from the processor to the consumption market. In fact, wholesalers take products from processing facilities/cooperatives that already have been deeply processed (such as *Gynostemma pentaphyllum* tea) to carry out consumption activities inside and outside the province. All have 5–7 years of experience in the pharmaceutical business and have specialised means of transportation and equipment.
- Retailers: In the value chain for medicinal plants in the study area, in addition to professional retail agents (purchasing goods from wholesale agents/or production cooperatives to carry out retailing), processing facilities also play a retail role and hold a very important position in promoting the chain (100% of processing facilities are active retailers). In addition, consumers also buy products directly from producers (8%), wholesalers and traders outside the province.

Linkages in the value chain: In addition to the vertical links to the processors, wholesalers and retailers are also horizontally linked with partners in the same industry:

- Horizontal links between wholesale agents: 100% of wholesale agents know and have information about each other. They also regularly exchange information with each other about product quality and the pharmaceutical market. However, 100% of wholesale agents consider their level of affiliation to be very difficult to determine and at a 'very loose' level.
- Horizontal link between retail agents: Medicinal plants are not a common commodity, so the pharmaceutical retailers in the study area all believe that they do not have a connection with each other because they are scattered in different areas.

3.1.7. Limitations in the medicinal plants value chain

Analysing the value chain for medicinal plants in the research area, the research team found that FFPOs are still not really assured to produce because the situation of organising the distribution and consumption of medicinal products in the research area is still limited.

The free market is still the main form of consumption of medicinal plants today, mainly formed spontaneously by individuals and private traders who supply to the market. This form will be difficult to manage in terms of product quality when consumed, but this is the easiest form to implement and it promotes the resources of society very well. Therefore, in the future, the free market is expected to still be encouraged to develop, but it is necessary to have state

management through mechanisms and policies that encourage the establishment of medicinal plants trading enterprises that can operate more effectively.

The study shows that the current agents of trading and distributing medicinal plants are business households with cramped business locations, lacking sufficient areas and conditions for preserving medicinal plants, with no storage warehouses or storage warehouses built that do not meet standards and do not ensure hygiene standards. Persons directly involved in the trading of medicinal plants do not have professional qualifications as prescribed, and do business mainly based on experience. Medicinal plants are often piled up as there are not enough shelves and are sometimes not labelled correctly.

The level of market development of medicinal products is not commensurate with the potential and expectations of producers. Producers have to find markets for their products themselves, so they are often forced to price in front of traders and sometimes lack the raw materials to supply processors.

There is no stable product purchasing unit. This is also a limitation in consumption, if the output of medicinal plants increases without a post-harvest processing plant or a unit to consume the product, the consumption will encounter difficulties. Meanwhile, there are no organisations or agencies to support market analysis or forecasts recommendations on output and selling prices. Therefore, many large medicinal herb production areas in the study area (such as producers of *Gynostemma pentaphyllum* in Tan Lac district) face difficulties in the harvest season, where there is an excess of product but too few buyers.

3.1.8. Support for the medicinal plants value chain

State support

Based on the current assigned functions and tasks, medicinal plants are under the management of the Drug Administration of the Ministry of Health. However, in practice, the management of medicinal plants is also related to many different ministries and sectors (Table 7).

Table 7. State agencies participating in the management of medicinal plants

	State management agencies	**Management functions**
	Ministry of Health (Institute of Medicinal Materials)	Management of medicinal plants

	Ministry of Agriculture and Rural Development (general department of forestry)	Management of cultivation of medicinal plants, management of forests (including medicinal plants and animals)
	Ministry of Industry and Trade	Management of the trade, import and export of medicinal plants, including medicinal plants
	Ministry of Science and Technology	Management of research, technology and standardisation
	Ministry of Finance (general department of customs)	Management and supervision of the import of medicinal plants at border gates
	Ministry of National Defence (border guard)	Coordination in managing smuggled medicinal plants through quotas in border areas
	People's committees of provinces/centrally run cities	Planning of farming areas and directing the rearing and exploitation of medicinal plants in the area

Source: Ministry of Health (2017)

At present, the state management of medicinal plants in Vietnam still has an overlap in functions and tasks between the Ministry of Health, the Ministry of Agriculture and Rural Development and the Ministry of Industry and Trade, which causes many difficulties and inadequacies in the state management of medicinal plants. Therefore, it is necessary to have close and unified interdisciplinary coordination between relevant ministries and branches. Policies to support the value chain of medicinal plants collectively labelled or PGS-certified as EbA-FFPs.

National policies to support the development of medicinal plants and collective labels include:

- Decision No. 1976/QD-TTg (2013): Approving the master plan for the development of medicinal plants to 2020 and orientations to 2030, including encouraging the development of medicinal plants cultivation areas associated with processing and consumption, especially certified products and collective labels.
- Decree 109/2018/ND-CP: Encouraging organic agricultural production, including the production of medicinal plants, with priority given to products with collective labels or PGS certification, contributing to improving product value.

In addition to the general policies promulgated by the central government, in order to promote the implementation of Decision No. 1976/QD-TTg, the provinces in the study area have also issued specific policies for the development of collectively labelled medicinal plants or PGS based on the EbA approach or sustainability along the local value chain. Some typical local policies are described in Table 8.

Table 8. Policies to support the medicinal plants in the research area

Location	Programme	Content
Bac Kan	OCOP programme Decision No. 386/QD-UBND, 19 March 2021, of Bac Kan Provincial People's Committee approving OCOP scheme for 2021–2025. Decision No. 1228/QD-UBND, 6 July 2023, of Bac Kan Provincial People's Committee on the adjustment and supplementation of the explanation of the OCOP scheme for 2021–2025.	Bac Kan province has focused on developing medicinal products that meet OCOP standards, including policies to support the building of collective brands and the PGS system. These policies include technical assistance, capital and trade promotion for medicinal products.
	Planning for development of medicinal plants.	The provincial government has made a plan for the development of concentrated medicinal areas, associated with the conservation and sustainable development of forest ecosystems, in which priority is given to products that have achieved PGS certification or a collective label.
Hoa Binh	Programme on development of medicinal plants associated with biodiversity conservation Decision No. 3119/QD-UBND, 28 December 2018, on approving a planning project for the development of medicinal plants in Hoa Binh province to 2025, with a vision to 2030.	Hoa Binh province promotes the development of medicinal plant cultivation areas that incorporate biodiversity conservation, aiming for products to be certified by systems that ensure sustainability.
	Supporting branding and collective branding.	The provincial government supports cooperatives and businesses to build and develop collective labels for medicinal

		products, combined with sustainable production standards.
Yen Bai	Policies on development of medicinal plants in the direction of high-tech application.	Yen Bai encourages the application of high technology in the production and processing of medicinal plants, and supports the construction of a system of PGS and collective labels for products, in order to ensure quality and increase product value.
	Supporting value chain development	Yen Bai province is implementing policies to support the development of a sustainable value chain for medicinal products, focusing on systems that ensure quality and transparency.

Financial services

- Capital support and preferential credit**:** Provinces have preferential credit programmes for pharmaceutical processing projects along the value chain, especially for products with collective labels.
- Tax incentives**:** Enterprises participating in the processing of medicinal plants with products certified with collective labels or PGS can enjoy tax incentives in accordance with the provisions of the Tax Law and the Investment Law.

Box 4. Investing in planting areas for 18 medicinal plants in Ba Be district

Bac Kan Provincial People's Committee has issued Plan No. 69/KH-UBND dated 8 February 2023 to implement a project on investment and support for the development of precious medicinal plants cultivation areas under Project 3, Sub-project 2, Content No. 02 in Decision No. 1719/QD-TTg dated 14 October 2021 of the Prime Minister. In 2024–2025, an investment was made for the development of concentrated planting areas for 18 types of precious medicinal plants with high economic value suitable for Ba Be district, Bac Kan province with a total investment of over 200 billion Vietnamese dong.

The project will invest in the development of cooperatives and production and processing establishments for precious medicinal plants with small to large scales, from preliminary processing and traditional processing to high-tech applications of deep processing to supply

raw materials and local medicinal products according to standard chain links, serving domestic needs and aiming for export.

The total area of the project is 225 hectares in Dong Phuc, Hoang Tri, Quang Khe, My Phuong, Yen Duong, Thuong Giao, Cao Thuong, Chu Huong communes in Ba Be district. The goal is to support at least 1,000 people to participate in the production chain of medicinal plants (of whom at least 80% of households are ethnic minorities) thereby contributing to reducing the rate of poor households in the communes.

Stakeholders include:

- Project management agency: Department of Agriculture and Rural Development.
- Chairman of the association: Southeast Vietnam Trading Company Limited.
- Project implementing unit: Donavi Bac Kan Precious Pharmaceuticals Joint Stock Company.
- Product deployment and consumption partners: Hamint Science and Technology Joint Stock Company; Vietnam Agriculture, Forestry and Environment Development Joint Stock Company.
- Science, technology, consulting partner: Institute of Forestry and Sustainable Development.
- Partners in onsite cultivation and preliminary processing of medicinal plants: Two cooperatives under the FFF project including Ta Anh Cooperative and Yen Duong Cooperative; Cao Thuong General Agricultural Cooperative; Thuong Giao Agricultural, Tourism and Service Cooperative; Na Sam Agriculture and Forestry Cooperative Group, Thuong Giao; Phja Khao cooperative group in Thuong Giao commune; Chu Huong Agriculture and Forestry Cooperative Group.

The total investment of the project is 229,743.48 million Vietnamese dong, of which the support capital from the state budget is 68,898.9 million Vietnamese dong (accounting for 29.99%), which will support leasing the forest environment to implement the project, buying technology copyrights, supporting the transfer and application of new science and technology, application of technical processes for planting, collecting, preliminarily processing and processing medicinal plants according to the World Health Organization Guidelines on Good Agricultural and Collection Practices for Medicinal Plants (GACP-WHO) standards; support investment in high-tech planting areas; support for investment in infrastructure in raw

material areas; support for investment in the construction of factories for processing and production of medicinal materials; support vocational training for onsite workers; support advertising and product branding; support inputs such as seeds, supplies, packaging and labels for precious medicinal plant growing areas.

Source: https://backan.gov.vn

Training and capacity building

- All provinces have implemented training programmes for people and businesses on farming, processing and quality-management techniques according to PGS standards and collective labels, to ensure that products meet quality and safety requirements.
- Supporting the development of quality management systems: Localities support pharmaceutical production and processing units to build quality-management systems according to PGS standards and collective labels, including product traceability.

Policies to encourage collaboration and alignment

- Building cooperative models: Provinces encourage the establishment of cooperatives for the production and processing of medicinal plants, in order to build collective brands and apply the PGS system, creating conditions for the consumption of products in the market.
- Public-private partnerships**:** Provinces encourage public-private partnerships in the development of herbal medicine value chains, with the participation of businesses, cooperatives and non-governmental organisations (NGOs), in order to enhance financial, technical and market support.

These policies not only support the development of the pharmaceutical industry in a sustainable direction, but also help improve the value of products through the use of collective labels and the PGS system, associated with ecosystem conservation and community development.

Certification and labelling

In localities, there have been mechanisms to promote and encourage economic sectors to invest in the field of cultivation, preliminary processing, processing and preservation of

medicinal plants in the country through rural and mountainous development projects as well as the One Commune One Product (OCOP) programme, a Vietnamese government programme that aims to promote the development of local products. However, investment resources are still very limited. The products are still mostly self-sufficient locally, due to fragmented and spontaneous practices, lack of regional linkages and value chain linkages and especially lack of international market information. Investment in the application of scientific and technical advances in farming, production and processing to meet the principles of international standards is still limited. FFPOs operating in the field of medicinal plants are small scale and competitive, and FFPOs under the FFF project have no investment in researching international market demand, have not participated in the global herbal supply chain, and have not been able to build Vietnamese herbal brands in the international arena.

According to the study site survey, third-party certification service organisations for the medicinal herb value chain are collectively labelled based on the EbA or sustainability approach described in Table 9.

Table 9. Third-party service organisations for the medicinal plants value chain

Service	Supporting organisations	Supporting content
Certification and traceability services	Agricultural cooperatives and NGOs	Supporting the community and cooperatives in achieving PGS certification or building a collective brand.
	Medicinal research institutes and quality accreditation centres	Certifying medicinal products, ensuring that products meet quality and sustainability standards.
	Vietnam Organic Agriculture Association (VOAA)	Providing organic certification services, ensuring products meet international standards.
	Technology/telecom companies such as FPT Corporation, Viettel	Providing technology solutions through the use of QR codes and blockchain to trace the origins of products, ensuring transparency from production to consumption.
Transportation services	Local transportation companies	Transporting raw materials and medicinal products between production areas to processing plants/consumer markets.
Financial services	VBSP and Agribank	Providing preferential credit packages for projects on cultivation and processing of medicinal plants, especially those associated with collective brands.

	Local Development Investment Fund	The provinces of Bac Kan, Hoa Binh and Yen Bai can establish or strengthen agricultural and rural development support funds, in order to provide financing for sustainable pharmaceutical processing projects.
	Bao Viet Insurance, PTI Insurance and other insurance companies	Providing agricultural insurance packages, helping to protect producers and businesses against natural disasters, climate change and market risks.
Trade promotion	The Ministry of Industry and Trade and local departments of industry and trade	Organising specialised exhibitions, helping cooperatives or pharmaceutical enterprises connect with domestic and foreign partners.
	E-commerce platforms such as Shopee, Lazada and Tiki	Providing effective channels for consumers of collectively labelled or PGS labelled medicinal products.

The organisation and use of third-party services is an important factor to help improve the efficiency of the value chain of medicinal plants collectively labelled or PGS certified, especially in the context of sustainability and ecosystem protection. These services not only help products meet quality standards, but also help expand markets, increase economic value, and ensure sustainable benefits for stakeholders.

As in the case of medicinal plants in Tan Lac Son Cooperative, Hoa Binh, the Hoa Binh provincial agricultural extension centre, the provincial department of agriculture and rural development in collaboration with the provincial farmers' union also work with input suppliers including agricultural agents, FFF organisations, the College of Agriculture (COA) and the Vietnam Organic Agriculture Association (VOAA) to estimate demand for both inputs and production. They work with private procurement businesses to arrange mobile points of purchase and transportation of medicinal materials. Extension officers are now using a variety of digital technologies to provide group extension services through social media such as the Zalo messaging app, which is increasingly being used to communicate extension advice. In addition, the cooperatives also receive technical support such as building the process of planting, caring, harvesting and processing medicinal plants (supported by the FFF and VNFU).

Other service providers include private transportation services in the study area such as joint stock companies/transport limited liability companies and transport cooperatives. These transportation services work with companies that purchase medicinal plants to ship products from point of purchase. In some cases, they negotiate with farmers who want on-time delivery to the warehouse. They also work with input suppliers to provide input to retail stores. The main drawback for these carriers is related to the low volume of business in terms of the number of products and inputs transported due to the small production volume, geographical dispersion, and fragmented nature of small-scale production farmers. As a result, business activity is generally low.

There are also financial service providers/supporters, including the Vietnam Bank for Agriculture and Rural Development (Agribank) and Vietnam Bank for Social Policies (VBSP), provincial branches and the Provincial Cooperative Development Support Fund in the study area, microfinance institutions and mobile money transfer agents. These organisations play an important role in providing financial support to FFPOs, helping them access the capital they need to develop sustainable production and business, and to pay for delivered products and purchased inputs. Except in a few cases, services are considered indirect; for this type of service provider, there is no need for a physical presence, but they only play a supporting role. However, according to the actual survey in the study area, FFPOs find it very difficult to access loans because they do not have collateral.

In order to ensure that FFPOs producing agricultural and forestry products can access the market, improve product value and develop a sustainable economy, it is necessary to ensure that farmers participate in enterprises with markets, the departments of industry and trade of the provinces in the area study, and organise trade promotion programmes and exhibitions, helping FFPOs promote their products and access the market. Provincial trade and investment promotion centres in the area study should support FFPOs in finding partners, expanding distribution channels and consuming products. The Vietnam Cooperative Alliance (VCA) in the area should research and support FFPOs to connect with the market and build product brands. However, these support interests have not been strong in localities due to the lack of adequate institutional arrangements to support and encourage FFPOs and lack of personnel in commune-level areas. VCA support funds in localities are almost non-existent.

3.1.9. SWOT analysis of the medicinal plants value chain

Table 10. SWOT analysis of the medicinal plants value chain in the study area

Strengths	Weakness
Diverse sources of Indigenous medicinal plants: Provinces such as Bac Kan, Hoa Binh and Yen Bai have rich and diverse sources of medicinal plants with many rare and native herbs that are only available in Vietnam, such as Illiciaceae in Thach Ngoa Cooperative, cinnamon in Ta Anh Cooperative (Ba Be district, Bac Kan province), *Folium ardisiae*, cinnamon in Tien Thanh T&T Cooperative (Tran Yen district, Yen Bai province), Tan Dong Pharmaceutical Cooperative. **Favourable terrain and climate:** The diverse terrain from the plains to the high mountains and the distinctly differentiated climate help to develop a variety of medicinal plants. In addition, the area of natural forests and planted forests in the research area is in a good condition, creating shade for the cultivation of medicinal plants. **Farmers are diligent and hard-working, have experience in producing and collecting medicinal plants**, and are ready to transform the crop structure. Crop quality-control measures have been applied with technical support from the FFF project such as building the process of planting, caring, harvesting and processing medicinal plants. **Farmers are willing to invest** and be aware of the effectiveness of medicinal plants in household economic development. Provinces in the study area are interested in the policy of linking four households to facilitate the development of medicinal plants.	**Limited investments:** Although investment incentives for medicinal plant cultivation are already in place, investment levels are still limited, especially investment in processing. Investment in research and technology of medicinal plants processing of cooperatives is still limited; cooperatives are not yet able to create high-quality products. **Unevenly developed infrastructure:** Some areas, especially mountainous areas, have underdeveloped transportation systems and infrastructure, making it difficult to harvest and transport medicinal plants. **Lack of knowledge and skills:** Locals may lack knowledge and skills about growing, harvesting and processing medicinal plants in a sustainable way. **Lack of access to distribution channels and international markets:** Cooperatives do not have management and supervision of distribution channels. Cooperatives have not been able to access international markets for export.
Opportunities	**Threats**
Large market demand: The demand for medicinal plants at home and abroad is increasing, especially natural and organic products. **Increasing production:** Provinces in the study area have developed plans for the development	**Limited markets:** The output market is still limited and fragmented. People do yet have the habit of using medicinal plants as a food for daily health care.

of medicinal plants to 2020 and projections to 2030. Also, many businesses and cooperatives are interested in the development of medicinal plants. **Improving processing:** The development of processing technology will create more choices for customers.	**Competition:** The ability to compete with medicinal plants from other provinces as well as medicinal plants from China is still limited. **Lack of processing facilities:** Processing facilities are still small, fragmented and have not met the needs of farmers' production of medicinal plants. The global value chain in terms of the market has very **strict technical barriers** to product quality. **Links in product production and processing are still weak and loose**, including vertical links (value chains) and horizontal links (production households). **Climate change:** Climate change can affect natural medicinal resources, changing the habitat of many precious plant species. **Overextraction:** The risk of depletion of Indigenous natural medicinal resources due to consumers preferring products extracted from nature.

4. Value chain for beekeeping in the study area

4.1 Analysis of factors in the beekeeping value chain

With a large forest area, suitable environmental and climatic conditions, beekeeping in the study area has many favourable conditions for development commensurate with its potential and advantages. Of the 25 FFPOs assessed in this study, six are already practicing beekeeping in Ba Be district (Bac Kan), Lac Thuy and Tan Lac districts (Hoa Binh) and Yen Binh and Tran Yen districts (Yen Bai).

The value chain of beekeeping in the study area consists of five main types of actors with different connections/relationships within and between types (Figure 6). The value chain is similar across all five rural districts assessed. The main actors in this value chain are beekeeping households/FFPOs, honey/bee-colony traders and honey wholesalers and retailers. There are limited or no support activities along the marketing chain such as processing and packaging in all five districts.

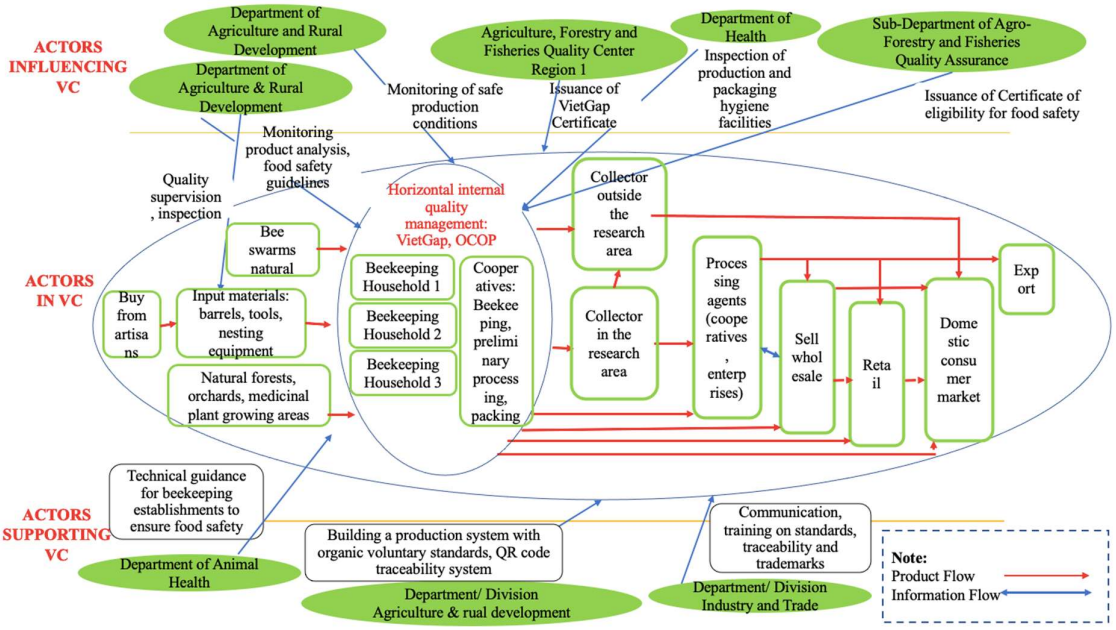


Figure 6. Map of the beekeeping value chain for cooperatives in the study area

Source: 2024 field survey data.

4.1.1. Beekeeping and honey processing

In recent years, beekeeping for honey in Vietnam has developed in both quantity and quality, mainly concentrated in mountainous and midland areas, including the research areas. Most of the beekeepers in the study area tend to learn knowledge and solve problems in beekeeping by

sharing information with each other. Consulting services on this issue are lacking and unpaid. Another way to find solutions to their problems is through social media platforms such as Zalo and Facebook groups. In addition, beekeepers also use the e-commerce platform Co.opmart to market their honey. This method is really positive and effective, especially if the group has skilled beekeepers and experts.

However, beekeepers in the research area lack training on non-honey beekeeping products, how to produce them, and how to market them effectively. These are products such as royal jelly, propolis and pollinated queens. This type of production requires beekeepers here to use fixed-frame hives. Recently, with the support of the VNFU, the Department of Agriculture and the FFF project, they have been trained and some are using fixed-frame hives.

The production process of FFPOs includes:

- Extracting and filtering the honey by squeezing it through a stainless-steel wire, filtering it to separate the water in the honey, then heating it to about 70–78 degrees C for a few minutes and then quickly cooling it to 25 degrees C to kill the yeast.
- FFPOs then package their honey and sell it to the market. In general, almost all beekeepers except those who have Langstroth hives and sell honey to their FFPOs are involved in some form of initial processing.

However, when assessing the quality management of honey, it is highly likely that at this stage, the quality of honey is highly compromised by the refining and coarse filtering processes. Honey often still contains foreign substances and impurities due to poor hygiene handling techniques and harmful beekeepers. Beekeepers in the FFF provinces sell honey directly to wholesalers and retailers or sometimes to end consumers. Beekeepers here do not have access to exporters.

Box 5. Beekeeping and honey processing by Tu Ne Beekeeping Cooperative

Tu Ne Beekeeping Cooperative of Tu Ne commune, Tan Lac, Hoa Binh province currently keeps 1,000 bee colonies. Some households have 10–15 colonies, and some have nearly 100 colonies. In 2023, the cooperative's honey output reached about 10 tonnes. The selling price of forest honey of Tu Ne Beekeeping Cooperative ranges from 200,000 to 250,000 Vietnamese dong/litre (equivalent to US$7.97–9.96/litre). The average income of Tu Ne Beekeeping Cooperative members from beekeeping is more than 22 million Vietnamese

dong/year/household (equivalent to US$876.49/year/household). In addition to honey harvesting, households also sell about 250 breeding bee colonies, bringing a total income from beekeeping of over one billion Vietnamese dong (equivalent to US$39,840.60). On average, each beekeeping household collects about 65 million Vietnamese dong/year (equivalent to US$2,589.64/year). This has encouraged many households to want to try their hand at beekeeping for honey. With the current selling price of about 600–700,000 Vietnamese dong per breeding bee colony (each colony has 3–4 frames) (equivalent to US$23.90–27.89 per breeding bee colony), farming households in Tu Ne Beekeeping Cooperative only need capital of about 6–7 million Vietnamese dong (equivalent to US$239.04–278.88) to start a model of raising 10 colonies of bees (equivalent to 10 hives). In Hoa Binh province, most bee colonies are of domestic bees: easy bees to raise, as they are suited to the weather, climate and forest ecosystem conditions of the province.

After buying seeds and taking advantage of the available garden area, fruit tree farm or forest area to place bee hives, beekeeping households only need to invest once. Once they know how to take care of their bees, they can develop more colonies and regularly harvest honey 2–3 times a month. The honey season is around February to August, so starting from March, beekeepers have honey to sell gradually throughout the year. The best plants for bees to collect honey are longan and lychee. Therefore, beekeeping for honey is considered suitable for areas with large forest areas and fruit trees such as Tan Lac district in particular and the whole Hoa Binh province in general.

Source: Field survey data, 2024.

4.1.2. Input factors

Input suppliers form the initial node of the value chain, and they provide beekeepers with all products and tools related to beekeeping and honey harvesting. There are not many Vietnamese entrepreneurs specialising in this field, so there are many beekeepers who cannot access their products and services.

Currently, entrepreneurs in this field mainly focus on producing/selling modern beehives including two common types of beehives (Newton hives and Langstroth hives) as well as other beehive equipment. They mainly sell beehives to beekeepers through cooperation based on reputation and acquaintance or sign cooperation contracts with organisations that provide technical guidance to beekeepers. A Newton hive with eight bridges was found costing about

545,000–730,000 Vietnamese dong (equivalent to US$21.71–29.08). A five-layer Langstroth hive costs 4,310,000 Vietnamese dong (equivalent to US$171.71). This cost is quite high for beekeepers.

In addition to the high cost of acquiring modern bee hives, design quality is also sometimes an issue and some hives have not been occupied for a long time (in some places up to two years). This has forced farmers to rely heavily on traditional hives, which have lower production and capacity as well as lower purchasing costs. With extensive experience in beekeeping combined with the growing popularity of modern hives and the need to make quick money, some FFPOs have modified their traditional hives using unsuitable wood and other products that alter the topology and setup of the standard Langstroth hives.

4.1.3. Actors in the beekeeping value chain

The final markets include domestic consumers, trading companies, restaurants, wine producers, industries that use honey in food processing or as a preservative, and official export markets. FFPOs in the research area are seriously lacking in linkages with the export market. However, according the survey in the study area, there are three popular sales channels:

- FFPOs that sell directly to consumers in the locality and neighbouring provinces
- Cooperatives that sell to retailers in the area, and
- FFPOs that sell to wholesalers/traders from the provinces.

Wholesalers

Wholesalers buy honey from FFPOs in large quantities (honey from 1,200 beehives per year). The implementation time is about four months because the beekeepers trust the wholesalers after years of cooperation with each other. Wholesalers sell that honey primarily to exporters, consumers/customers, and to some restaurants. The most common packaging is plastic containers.

Retailers

Retailers are stores that sell all kinds of honey locally in addition to other product lines (such as local healthcare and beauty products) but their sales are lower than those of major stores. There are also shops (e.g. clean produce stores in the provinces) that sell food items and also honey. They do not specialise in the honey chain, they buy directly from beekeepers and sell

to customers, and some even buy from wholesalers. The percentage of profit that the retailer receives is about 16% (KII with a local retailer).

4.1.4. Support for the beekeeping value chain

State support

Legal and regulatory frameworks for beekeeping and honey production include:

- Law on Livestock No. 32/2018/QH14: this law provides general regulations on livestock farming activities in Vietnam, including beekeeping. It specifies the requirements for breed management, environmental protection in animal husbandry, and regulations on animal welfare.
- Decree 13/2020/ND-CP: Detailing a number of articles of the Law on Livestock, including regulations on management of livestock breeds, animal feed, and hygiene and safety in livestock.
- Circular 23/2019/TT-BNNPTNT: Regulations on the list of livestock breeds allowed to be produced and traded in Vietnam, including honeybee breeds.
- Circular No. 15/2022/TT-BNNPTNT dated October 24, 2022: Regulations on the inspection and supervision of veterinary hygiene and food safety for honey. In particular, it clearly stipulates the responsibilities of beekeeping, honey procurement and processing establishments. This Circular does not replace Circular No. 08/2015/TT-BNNPTNT dated March 02, 2015 on the inspection and supervision of veterinary hygiene and food safety for the production and trading of honey for export.

Policies to support honey value chains in the research areas focus on sustainable development, environmental protection, and product value enhancement through collective brands. These policies not only provide financial and technical support, but also help build brands and connect markets, ensuring that honey products are of high quality and meet the requirements of domestic and foreign consumers. However, beekeepers need to be more aware of these rules and norms. The support policies are shown in Table 11.

Table 11. Policies to support beekeeping and honey value chains

Policy type	Programme	Implementation
Policies on sustainable agricultural development and environmental protection	Sustainable Agriculture Transformation Programme	Decision No. 885/QD-TTg (2020) of the Prime Minister on approving the scheme for organic agriculture development for 2020–2030, promoting sustainable agricultural development, including organic beekeeping. **Objective:** To encourage beekeepers to adopt sustainable farming practices, limit the use of chemicals, protect natural ecosystems and develop collective brands or PGS.
	Forest Protection and Sustainable Forest Development Program	Programmes such as the afforestation and forest protection project (Project 661) support the protection and development of natural forests, create a rich source of nectar for bee colonies, and promote beekeeping based on forest ecosystems. **Implementing agency:** MARD, departments of agriculture and rural development in the study area.
Policies to support the construction and development of collective brands	Collective trademark development policy	Decree No. 98/2018/ND-CP on policies to encourage cooperation and association in the production and consumption of agricultural products, including support for building collective brands for honey products. **Support:** Cooperatives and beekeeping household groups are supported with trademark registration, branding and trade promotion for honey products.
	Participatory guarantee system (PGS)	The National Programme for Organic Production (NPOP) certification encourages the development of a PGS system for honey products. **Support:** Technical training, product-quality monitoring and evaluation, legal support and certification registration.
Financial and credit support policies	Preferential credit support	VBSP and Agribank provide preferential credit packages to beekeepers and cooperatives, especially sustainable beekeeping development projects with PGS certification. **Support:** Beekeepers can access low-interest capital to invest in equipment, scale production and improve product quality.
	Support from the Vietnam Environmental Protection Fund	The fund provided preferential loans and financial support for beekeeping projects with environmental protection factors, contributing to maintaining the ecosystem and sustainable development.
Technical support and capacity-building policies	Agricultural extension programmes	The programmes organise technical training courses on sustainable beekeeping, disease management, honey harvesting and processing according to PGS standards and collective brands.

		Implementing agencies: Local agricultural extension centres in Bac Kan, Hoa Binh, Yen Bai.
	International cooperation agencies and NGOs	IIED and other NGOs work with local governments and beekeeping cooperatives to provide technical assistance, build PGS systems, and connect markets.
Trade promotion and market development policies	Vietnam Trade Promotion Agency (Vietrade) programmes	Veitrade under the Ministry of Industry and Trade supports trade promotion for honey products with collective labels or PGS through fairs, exhibitions and connections with international markets. **Support:** Developing marketing strategies, supporting trademark registration in foreign markets, and developing brands.
	OCOP programme	OCOP supports provinces to develop local honey products according to quality standards, combined with collective brands or PGS to enhance product value. **Benefits:** Honey products can be recognised as OCOP products, which increases their value and sales.
Policies to support product-quality management and supervision	Product-quality management	NAFIQAD monitors the quality of honey, ensuring that the product meets food-safety and traceability standards, especially for export products.
	Inspections	The Agricultural Commodities Inspectorate conducts periodic inspections at beekeeping facilities to ensure compliance with regulations on animal husbandry, environmental protection and food safety.

Certification, labelling and traceability services

This section of the value chain mainly consists of actors involved in the supporting functions of the beekeeping sub-industry but that do not directly or indirectly handle goods. The function of these actors is important for the growth and development of the beekeeping subsector, whereby without these actors, the subsector will not function effectively, especially in production and processing factors.

Authorities such as the National Agro-Forestry-Fisheries Quality Assurance Department (NAFIQAD) and centres under the Ministry of Agriculture and Rural Development (MARD) in the provinces often provide certification services for organic honey products and certification bodies such as Control Union or Ecocert provide international organic

certification, which helps qualify honey products for export. These organisations provide product testing, certification services according to PGS or organic standards, support in dossier preparation, compliance assessment and certification.

Technology and quality management companies provide traceability systems for beekeeping from honey harvesting to processing and packaging. Some notable companies include TraceVerified and AgriDigital. The benefits are that this ensures the transparency of the honey value chain, helping consumers and commercial partners to trace the origin of products, improving product reliability and value in the market.

Transportation services

Companies and cooperatives that transport medicinal products also accept the transportation of bee products (mainly honey). However, in beekeeping, it is also considered very important to facilitate the transportation of honeycombs from one forest to another, but at present, due to the increase in fuel prices, the cost of transportation from one region to another is difficult and leads to an increase in the investment cost of the beekeeper. This type of service is limited and has not been well organised into specialised companies that can help beekeepers receive the most competitive quotes/offers to transfer their hives. Therefore, it is important to encourage investors and facilitate transportation. At FFPOs under the FFF project, the transportation work is mostly self-sufficient.

Training and capacity building

The Department of Industry and Trade, the Department of Agriculture and FFF organised technical training classes for beekeepers, supporting FFPOs to transform the model. A typical example is the case of Tu Ne Beekeeping Cooperative (Box 5). Through participating in FFF training classes, Tu Ne Beekeeping Cooperative has encouraged members to use personal protective equipment including helmets, long jackets and pants, gloves and safety shoes to ensure hygiene when harvesting honey and to have the highest product quality. In the product packaging stage, Tu Ne Beekeeping Cooperative has been trained to improve the packaging process for employees; the bottles are completely sterilised when packaging honey to ensure the quality of clean honey. FFPO members have been trained on how to use honey-harvesting tools and equipment such as honey rotary barrels, centrifugal force, honey scrapers, brooms, feeding chutes, filter chutes, and honey storage chutes. The FFPO has built a honey warehouse with suitable conditions to preserve honey and ensure honey quality.

However, it is very rare for beekeepers and investors to pay for consulting services to any lecturer or specialist in beekeeping and honey production, such as requesting feasibility studies for the establishment of beekeeping gardens or pest-management solutions for bees. Beekeeping and honey-production professionals and instructors also do not represent, introduce or market themselves and their services at an appropriate fee. This culture should be introduced to beekeepers in the localities where FFF projects are located and others in the value chain who have previously received free critical counselling services.

Financial services

Just like cooperatives producing medicinal plants, beekeeping and honey-processing cooperatives can also borrow capital from Agribank/VBSP, provincial branches, and provincial cooperative development support funds. However, beekeeping cooperatives in the study area also find it difficult to access this capital because they do not have collateral. Currently, beekeeping cooperatives under the FFF project have access to a green credit fund worth 13 million Vietnamese dong (about US$500) funded by FFF to support poor households in production, especially to mitigate crop losses due to climate and disease risks. These green credit support funds are provided on an annual rotation cycle, so other poor households in the cooperatives will also be able to access them (on average, five households have access to this green credit each year).

Trade promotion ***services***

The Trade Promotion Agency (Ministry of Industry and Trade) promotes the national trade promotion programme to help honey-processing enterprises participate in domestic and international trade fairs, exhibitions and trade promotion events, enhancing market access. They also provide consultations on marketing strategies, supporting branding for collective labelling of honey products or PGS, and connecting with commercial partners.

4.1.5. SWOT analysis of the beekeeping value chain

Honey produced at FFF-project cooperatives is popular in local, regional and national markets, due to its aroma and taste, in addition to its nutritional and health benefits. The honey products of these cooperatives are all rated three stars by the OCOP programme or recognised as stratified honey. Unfortunately, there has not yet been a trademark certification of honey for cooperatives under the FFF project put into practice.

All beekeepers in the study area have a long tradition of beekeeping, with a lot of experience accumulated and transferred through generations. Honey in FFF-project cooperatives is mainly produced from natural vegetation in the mountains and plains in the study area where there are a variety of flowering plant species that provide a rich source of nectar and pollen, not from cultivation. In general, beekeepers try to avoid using pesticides on their farms to protect the bees from loss or contamination. In addition, beekeepers here often avoid using chemicals to control pests. This results in honey with organic properties.

Moreover, the opportunities for beekeeping are increasing. Specifically, organic certification can increase the return on investment and create more position in the market. There are many support programmes from government and international organisations to develop the beekeeping industry, including training, equipment and technical funding. The ability to combine beekeeping with ecotourism creates unique experiences for visitors, and at the same time expands the product consumption market.

The need to systematically improve the safety and quality of all food export items is essential in all countries. Establishing quality and sanitation controls that meet World Trade Organization (WTO) requirements for honey through the provision of technical assistance and training to enforce controls is imperative for the future of the FFF honey cluster. There is potential to transfer knowledge and skills in the use of modern beehives to the main beekeeping areas in the study area. MARD has experience implementing the programme and plans to provide services that benefit the honey industry, including laboratory testing facilities.

In addition to the advantages and opportunities mentioned above, beekeeping also faces many difficulties and challenges. Honey is mainly produced by landless beekeepers who own very few hives. In general, beekeepers lack training and knowledge of modern beekeeping methods. The movement of beekeepers reduces access to agricultural extension support. Beekeepers tend to lack the capital to buy hives and equipment. Beekeepers in FFPOs lack knowledge about the diseases that affect bees and how to treat them. Most beekeepers use informal marketing systems, and lack proper processing and packaging standards, leading to a lack of trust among traders. The leadership of beekeeping cooperatives under the FFF project lacks experience in running cooperatives (beekeeping cooperatives under the FFF project

have just converted the model from THTs[3] to cooperatives in the last two years). FFF has supported cooperatives in developing best practices for beekeeping, such as the introduction of Langstroth hives and related breeding tools as well as off-season feeding of bees, along with the development of a detailed handbook on all issues related to beekeeping and modern beekeeping methods. Unfortunately, the information in the book is only available to very few beekeepers and mostly to beekeepers who have only a few permanent hives. Honey products have not been strongly branded, lacking effective marketing strategies to widely reach potential markets. The main difficulty in obtaining modern beehives is cost. Difficulties in accessing modern harvesting and post-harvest tools and equipment affect the production of high-quality honey (such as electric honey extractors, manual and fruit honeycomb presses). Wholesalers said consumers do not trust the quality of honey, the price is too high and the packaging is not suitable for the market. The lack of access to finance facilitates beekeepers and other actors in the honey value chain in study area means they are unable to expand their businesses.

One of the biggest challenges that beekeeping FFPOs face is climate change and disease. This is an important factor related to honey production in the research area in recent years. The lack of rainfall and the ensuing drought have limited production and are likely to continue to be a factor in the coming years. Cheaper imported honey can dominate the market, putting pressure on local products. Diseases and pests in beekeeping (whip disease, bacterial disease) are a serious problem in that most beekeepers do not know how to deal with pests that attack their bees, despite efforts to address this gap through informal communication through Zalo groups and through consultation with experts. It is still very necessary to train beekeepers in the study area in a practical way through projects organised in collaboration with the VNFU and the Vietnam Beekeepers Association. In addition, beekeeping input suppliers do not have advanced knowledge of solutions for bees, including vitamins, medicines or proper nutrition, which opens up the potential to train them on how to find such solutions and how to produce them domestically or import them internationally.

Competition from alternative products is also a challenge, especially competition from cheap or unknown honey products on the market can reduce the market share of PGS-certified honey or collective brands. Stringent requirements and standards from international markets

[3] THTs are collective producer groups, locally called ‘To Hop Tac’.

can be a major challenge for small honey producers in exporting their products. The international certification and inspection process can be costly and complex for small-scale producers.

Table 12. SWOT analysis of the beekeeping and honey production in the study area

Strengths	**Weakness**
• Traditional experience and knowledge • Ecosystem-based beekeeping methods	• Small-scale production • Lack of infrastructure and technology Lack of marketing and commercial skills
Opportunities	**Threats**
• The trend of consuming organic and sustainable products • Support from governments and international organisations • Ecotourism development • Building capacity to enhance quality control Transfer of knowledge and skills in modern beekeeping	• Impacts of climate change, pests and diseases on beekeeping • Competition from imported honey products, cheaper products and products of unknown origin • Trade barriers and international standards

5. Value chains for citrus fruits in the study area

5.1 Analysis of factors in the citrus fruits value chain

Fruit trees are one of nine national key industries serving Vietnam's agricultural restructuring. The production of citrus fruit trees has continuously increased, in 2009–2019 reaching an average rate of 10% per year in terms of area (7,300 hectares/year) and 12.5% per year in terms of output (69,400 tonnes/year). The area of citrus fruit trees in 2019 reached 256,860 hectares (24.07% of the total area of fruit trees) and the output was more than 2.46 million tonnes, of which oranges and grapefruit accounted for about 38% of the area of each type, lemons 15.1% and tangerines 8.6%. The total export value in 2019 was US$47.5 million. The Northern provinces have 121,970 hectares of citrus fruit trees (47.5% of the country), of which oranges account for nearly 45.6%, grapefruit accounts for 40.2%, tangerines 7.4% and lemons 7.9% (Department of Crop Production 2020).

In the study area, citrus trees are widely grown, mostly for home consumption. Citrus fruit trees bring high-economic value, contributing to the socioeconomic development of localities and the growth of the province's agricultural industry. For example, Hoa Binh province has formed a citrus production area. Orange production areas are in the districts of Cao Phong, Kim Boi, Lac Thuy and grapefruit production areas are in the districts of Tan Lac, Yen Thuy,

Luong Son. The value of planting citrus trees ranges from 300 to 350 million Vietnamese dong/ha/year (about US$12,000–14,000/ha/year). All cooperatives in the study area have either converted or are in the transition of converting to sustainable practices/organic practices, using organic and circular agriculture. The results of the value chain mapping show that the actors include government agencies, farmers and the private sector (Figure 7). The value chain mapping results presented here are based on existing and potential value chain components including: seed suppliers, producer households, traders/retailers who buy fruit to sell elsewhere, retailers of agricultural goods including convenience stores, supermarkets and end consumers.

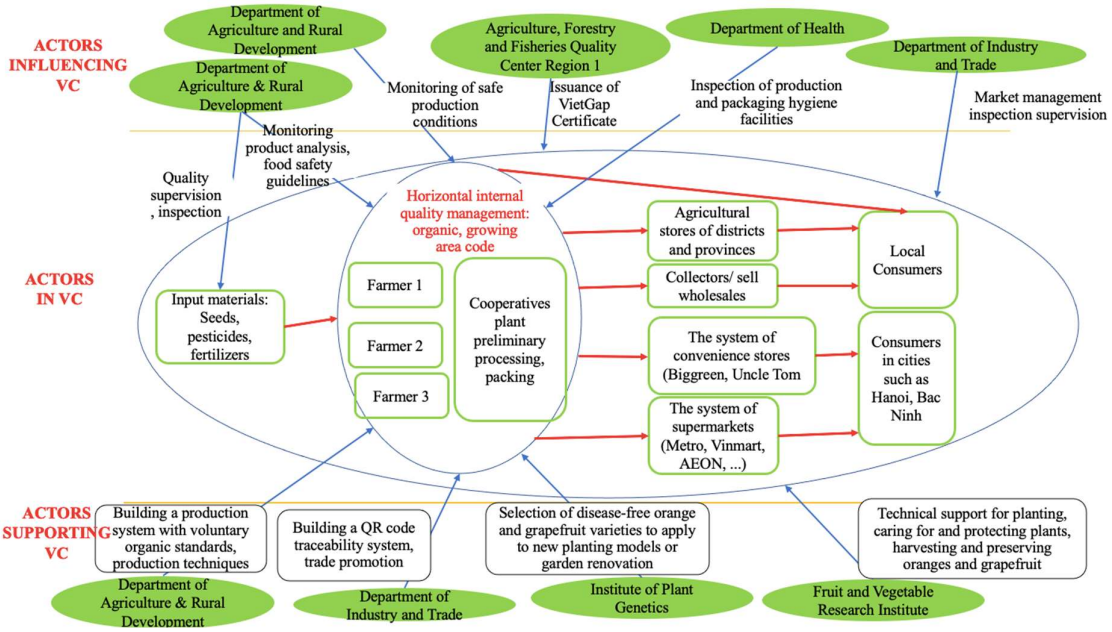


Figure 7. Map of the citrus fruit value chain for cooperatives in the study area

Source: 2024 field survey data.

5.1.1. Citrus fruit producers

All study provinces such as Yen Bai, Son La, Thai Nguyen, Bac Can and Hoa Binh have suitable climatic conditions for growing citrus trees such as oranges, tangerines and grapefruits. Small-scale producers account for more than 95% of the citrus tree production cooperatives (oranges, tangerines, grapefruits) in the study area. The majority (92%) of citrus farming households are male owned. The average land area for planting citrus trees ranges from 0.04 to 2.4 hectares/household; with a general average of 0.4 hectares. Generally, citrus land belongs to households, thus facilitating strategic planning, which is essential for tree planting and removal decisions. At the target cooperatives, red pomelo is dominant compared

to other products such as orange, tangerine and pomelo. Popular grapefruit varieties grown in the target cooperatives are red grapefruit and local grapefruit. The practice of orchard management is basic, as most producers plant trees in natural conditions (planting seasons are spring or the rainy season), and use organic fertilisers. Respondents also use pesticides and insecticides to control pest attacks but these are applied indiscriminately and infrequently.

Many places still maintain traditional farming methods. The average orchard weeding is done three times a year by slashing, hoeing and/or ploughing with a bull plough. Ploughing for weed management under the tree often leads to damage to the roots and affects yield levels. Most of the labour used to manage orchards is of family origin. Generally, production depends on rain, but the study area has often experienced drought over recent years. As a result, the crop does not have enough soil moisture, which in turn affects the yield and quality of the fruit.

Harvesting is usually carried out seasonally, depending on the type of crop and specific weather conditions. The harvesting process is mainly manual. The fruit of citrus trees is a difficult agricultural product to preserve because of the high amount of water in the fruit (95%), which is a good condition for bacteria to operate. Therefore, the farmers usually choose a sunny day in the morning after the dew dries, or cuts the fruit in the afternoon, or avoiding harvesting the fruit when the sun is hot, which will make the essential oil cells tense and the fruit fragile. After harvesting and chemical treatment, the cooperative keeps the fruit in the shade for a few days to dry before putting it in a storage bag. The bag is about 0.02–0.03mm thick and each bag stores one fruit (applicable when the fruit is stored for less than 15 days). When storing for a long time, the cooperative uses a very thin polythene wrap wrapped around the fruit or cold storage. Citrus products are usually consumed fresh. However, some are processed into juice, canned, or made into jam to increase their value and extend their shelf life.

5.1.2. Input factors

The value chain actors of the input supply include enterprises supplying fertilisers and plant varieties, agricultural service cooperatives, agricultural service shops, and small owners/groups of farmers breeding seedlings. The supply of seedlings includes both formal and informal systems. The official system involves on the one hand ensuring that the material is recognised for propagation from the Department of Crop Production of MARD or its branches, from the University of Agriculture and the Vietnam National Seed Joint Stock

Company (Vinaseed). On the other hand, the informal system involves individual farmers or groups of farmers sourcing breeding materials from anywhere, multiplying them, and distributing them to farmers through on-farm sales or open-market sales. The main problem affecting production plans at the seedling supply stage is the uncertainty of varieties, which is believed to be due to the limited/lack of traceability of raw materials.

5.1.3. Actors in the citrus fruits value chain

Traders

Traders plays an important role in the value chain of collectively labelled fruits. Through creating demand and establishing consumption links, this group promotes the application of sustainable standards, ensures product quality, and enhances the value of fruit products from the provinces of Bac Kan, Yen Bai, Thai Nguyen, Hoa Binh and Son La. Close linkages between traders and producers is a key factor in sustainable development and market expansion for these products.

Retailers

Retailers include supermarkets, convenience stores, and stores specialising in organic products and clean agricultural products. Retailers often require products to have food safety certification, clear traceability, and be certified to sustainability standards such as PGS. Many retailers are committed to providing high-quality, environmentally friendly products, and often seek to source their products from production regions that are recognised for sustainability. In the study area, the retailer establishes close relationships with cooperatives through the signing of procurement contracts to ensure a stable and quality supply. This motivates manufacturers to comply with sustainability standards and collective labels or PGS.

Wholesalers/brokers

In the survey area, cooperatives often work directly with wholesalers. Some cooperatives also sell fresh fruit directly to end consumers at local markets, roadside stands, and through street vendors in both urban and rural areas. Wholesalers coordinate closely with brokers and shippers to ensure that products are boxed and transported properly from rural production areas to market destinations. Brokers serve as intermediaries between producers and traders, facilitating the transfer of products to market. One cooperative owner noted that “traders excel at finding new buyers for cooperatives and operate more professionally, though cooperatives sometimes feel pressured by traders’ control over pricing and distribution channels.”

The domestic market is the main one. Products such as grapefruit and oranges from these regions are gradually becoming better known and have export potential, but there are also difficulties in standards and brands.

5.1.4. Support for the citrus fruits value chain

State support

The state management of citrus fruits that are collectively labelled or certified under the PGS in Vietnam involves several relevant agencies at various levels. While an official PGS specifically based on EbA standards does not yet exist, these agencies play a role in managing, supervising and supporting the development of collectively labelled or PGS-certified fruit products, which could potentially align with EbA principles. Table 13 lists the primary agencies involved in these efforts.

Table 13. State management of fruits

Regulatory authority	Role
Ministry of Agriculture and Rural Development (MARD)	**Policy direction:** The ministry is responsible for developing and implementing policies related to agriculture, including the management and development of the PGS system and collective labels. **Promulgation of regulations**: The ministry promulgates standards and regulations related to safe cultivation, sustainable production and certification of agricultural products. **Development support**: The ministry provides technical and financial support for the development of PGS systems and collective labels, with a particular emphasis on high-value products such as fruits.
Department of Crop Production	**Crop management:** The department, under MARD, manages crop-cultivation activities across the country, including monitoring the application of standards such as VietGAP and PGS. **PGS certification**: The department participates in the process of developing and implementing standards for the PGS system, ensuring that products meet food-safety and sustainability requirements.
Plant Protection Department	**Plant safety management:** The department is responsible for controlling the use of pesticides, monitoring drug residues on fruit products, ensuring that products meet safety standards. **Certification and inspection:** The department inspects and certifies products according to safety standards, especially for products with collective marks or according to the PGS system.
NAFIQAD	**Quality inspection:** NAFIQAD is responsible for inspecting and certifying the quality of agricultural products, including fruits that are collectively labelled or according to PGS.

	Traceability: NAFIQAD monitors and supports the construction of a traceability system for these products, ensuring transparency and reliability.
Departments of agriculture and rural development of provinces	**Implementation of local policies:** These provincial departments are responsible for implementing MARD policies at the local level, supporting cooperatives and farmers in developing fruit products according to PGS standards or collective labels. **Monitoring and support:** The departments monitor the production process, issue certification, and provide technical support to farmers and cooperatives applying the PGS system.
National Office of Intellectual Property of Vietnam (NOIP)	**Collective trademark registration:** NOIP manages the registration and protection of collective trademarks, including fruit products produced under the PGS system. **Legal assistance**: NOIP provides consulting and legal support services related to intellectual property rights protection for collective trademarks.
Independent certification organisations and farmers' associations	**Certification and monitoring:** Independent certification bodies provide product-certification services in accordance with PGS standards, monitoring the production process to ensure compliance with quality and safety requirements. **Farmer support:** Local farmers' associations often play a role in supporting the organisation, providing information and training for farmers on PGS standards and collective labels.

The support policy in the study area focuses on promoting fruit production in a sustainable direction, through the development and application of PGS standards and collective labels. These policies include financial and technical support, infrastructure construction, and trade promotion, in order to create added value for products, protect the environment, and increase farmers' incomes. Here are the key points:

National-level policies

Firstly, national-level policies widely applied in the study area include:

- National Target Programme on New Rural Development: The programme encourages localities to develop sustainable agricultural production, including clean production models, apply VietGAP and other standards, and develop collective brands for agricultural products. It provides funding, technical guidance and support in building infrastructure for fruit production and processing.
- Decision No. 135/QD-TTg on socioeconomic development of extremely difficult areas: Supports socioeconomic development in extremely difficult areas, including northern mountainous provinces such as Bac Kan, Hoa Binh, Yen Bai, Son La, Thai Nguyen. The focus is on supporting farmers to grow crops sustainably, apply clean

production standards and develop value chains. It provides financial funding, technical assistance and agricultural extension, as well as training and capacity-building programmes for farmers.

- Decision 950/QD-TTg on development of national key agricultural products: This supports the development of key agricultural products along the value chain, including building collective brands, PGS certification and developing consumer markets. It provides funding for research and development (R&D) and technical support in the production and marketing of products.

Provincial-level policies

In addition, based on national policies, the provinces in the study area have adjusted and revised policies in accordance with the actual conditions of each province.

- Bac Kan province: Promulgates a policy to support clean agricultural production with the content of supporting clean agricultural production models, promoting the use of collective brands and the PGS system in fruit production. It provides financial support, construction of production infrastructure, and provision of technical training to farmers.
- Hoa Binh province high-tech agricultural development policy: Hoa Binh is focusing on developing high-tech agriculture, including the application of PGS standards and the development of sustainable agricultural models. It provides funding for sustainable agriculture projects, supporting the construction and development of collective brands for fruit products.
- Yen Bai province rural economic development policies: Yen Bai focuses on sustainable agricultural development and supports the development of high-value agricultural products, including PGS-certified fruits or collective labelling. It provides financial and technical support and construction of agricultural infrastructure.
- Son La province policies to encourage the development of production along the value chain: Son La promotes the development of fruit products along the value chain, especially those with collective brands. Provides support in building and developing collective brands, providing technical training, and supporting market access.
- Thai Nguyen province policies to support production-consumption linkage: Thai Nguyen encourages the linkage of production with consumption along the value chain, with support for the application of PGS standards and collective brand development. Support includes financing sustainable manufacturing projects, technical support and

trade promotion.

Transportation services

Transportation companies play an important role in ensuring that fruit products are transported safely and quickly from the place of production to the consumption market. In the study area, local transport companies such as Hoa Binh Transport and Service Joint Stock Company, or larger units such as Viettel Post can participate in the fruit supply chain. Transporters often use trucks/pickups and bus trunks to move citrus fruits from production points to distribution points. Shipping costs vary depending on the number of shipments, the means of transportation, and the distance covered.

Financial services

Banks and credit institutions such as Agribank and VBSP branches in the provinces in the study area provide preferential financial packages for farmers and businesses to participate in the fruit value chain in a sustainable direction. In addition, government-supported insurance schemes through insurance organisations such as PVI Insurance provide agricultural insurance services to help mitigate risks for farmers against climate change and production risks.

Trade promotion services

Trade promotion centres under the provincial departments of industry and trade have the role of building product brands, finding trade partners and organising fairs and exhibitions to introduce products to the international market. They have supported farmers and businesses in the area to research and access new markets, raising consumer awareness of certified and collectively labelled fruit products.

5.1.5. SWOT analysis of fruit value chain

Table 14. SWOT analysis of the citrus fruit value chain in the study area

Strengths	Weakness
• **Natural conditions are favourable** for the growth of citrus trees, especially areas of moderate elevation and fertile alluvial soils. • **Quality and product characteristics:** Citrus trees in these regions are famous for their sweetness, low seeds and characteristic	• **Seed quality:** It is difficult to choose seedlings suitable for the soil and terrain, the quality of varieties has not been improved, so the quality of products has not kept up with other countries in the region and the world.

aroma, meeting the high demand of the market. • **Long-standing farming tradition:** Many localities have experience in growing and caring for citrus trees for generations, creating a solid foundation for production.	• **Underdeveloped infrastructure:** Difficult transportation, especially in mountainous areas, hinders the transportation of products to major markets. • **Lack of investment in technology:** Post-harvest cultivation and preservation technology is still limited, affecting productivity and product quality. • **Lack of effectiveness in marketing and branding:** The product does not have a strong brand, and lacks marketing strategies to build an image and expand the market. • **Low prices for producers:** Traders squeeze prices. • **Traceability:** The consumer requires the product to have traceability and products must have legal status. • **Low added value:** The cooperatives have not yet added value to their products as they only sell raw unprocessed fruit. In addition, they do not understand their customers' needs or preferences.
Opportunities	**Threats**
• **Increase in domestic demand and exports** • **Preferential policies** for investment in agriculture, especially in the field of high-quality fruit cultivation, such as tax reductions, capital support and technical training. • **Agricultural tourism development:** The ability to link citrus cultivation with tourism can create opportunities for tourists to experience harvesting and enjoying products on the spot, contributing to improving added value.	• **Competition** from imported products and other provinces in terms of price and brand. • **Climate change** can be detrimental to farming conditions, while disease can affect productivity and product quality • **Depletion of nutrients in the soil** • **Input material prices increased:** The cost of fertilisers, pesticides

6. Value chain for vegetables in the study area

6.1 Analysis of factors in the vegetables value chain

In the study area, the cooperatives all grow seasonal vegetables and tubers in the lowlands of afforestation activities. The list of safe vegetable production areas of all provinces in the study area are approved by the MARD development scheme for safe and concentrated vegetable production areas, ensuring traceability associated with processing and consumption market to 2030 (Decision No. 4765/QD-BNN-PTNN dated November 9, 2023). Vegetables include cabbages of all kinds, legumes, cucumbers, onions, garlic and native vegetables. In particular, there is a group of key vegetables concentrated in two provinces, namely Son La (legumes, vegetables) and Thai Nguyen (vegetables of all kinds and tomatoes).

During field surveys in study areas, the research team found that all cooperatives under the project planted, cared for and processed vegetables. Cabbages are a group of vegetables belonging to the Brassicaceae family and are very popular and widely grown in the study area including cabbage, bok choy and sweet cabbage. Only Thai Nguyen producers grow cat cabbage, a specialty vegetable of the highlands, often processed into boiled or stir-fried dishes. Yen Bai and Hoa Binh have popularised chrysanthemums.

Vegetables have many nutritional properties and health benefits. Table 15 presents some of the general characteristics of vegetables.

Table 15. General characteristics of vegetables in the value chain

Vegetables	Nutritious	Health benefits
Cabbage	Rich in vitamin C, vitamin K, vitamin B6, folate and fibre. Cabbage also contains antioxidants such as polyphenols and sulphur.	Strengthens the immune system, supports heart health, improves the digestive system, and reduces the risk of cancer.
Bok choy	Rich in vitamin A, vitamin C, vitamin K, calcium, magnesium and potassium. Bok choy also contains anti-inflammatory and anti-cancer compounds.	Promotes bone health, aids digestion, improves eyesight, and protects skin.
Chinese cabbage	Rich in vitamin C, vitamin K, folate, and calcium. Also contains antioxidants such as beta-carotene and lutein	Supports bone health, strengthens the immune system, reduces the risk of chronic

		diseases, and improves digestive health.
Chrysanthemum greens	Rich in vitamin A, vitamin C, vitamin E, potassium and fibre. Also contains anti-inflammatory and antioxidant compounds.	Improves eye health, strengthens the immune system, supports digestion, and reduces inflammation.
Cat's whiskers (*Orthosiphon aristatus*)	Rich in vitamin C, vitamin A, calcium and iron. Also contains anti-inflammatory and antioxidant compounds.	Supports eye health, boosts the immune system, improves bone health, and reduces inflammation

Source: Ha et al. (2010).

These vegetables are not only an important source of nutrition but also contribute to the agricultural economy of these provinces. The cultivation and consumption of these vegetables helps ensure food security and improves income for local farmers. The vegetable value chain map in the study area is depicted in Figure 8. It shows the four main stages for value chain actors (input suppliers, producers, processors/purchasers, and buyers), facilitated by supporting service providers.

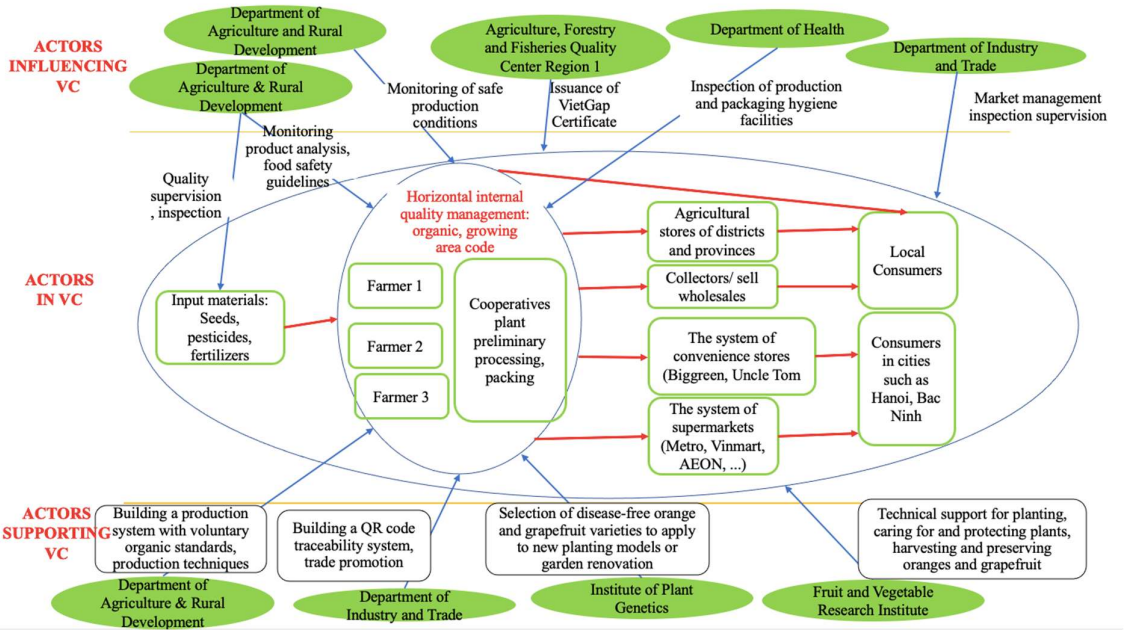


Figure 8. Map of the vegetables value chain for cooperatives in the study area

Source: 2024 field survey data.

6.1.1. Vegetable producers

Most of the cooperatives under the FFF project are from diverse agroforestry landscapes, which is a combination of forestry components such as natural forests, planted forests with agricultural components including crops such as fruit trees, annual trees, rice fields, zucchini (fragrant zucchini), galangal and seasonal vegetables distributed across three altitude areas: high, medium and low areas. Today's cabbage varieties have many varieties and can be grown all year round, with high tolerance to hot and humid climates. In cold winters, cabbage grows quickly and gives high yields on humus-rich, well-drained soils. It is an easy-to-grow vegetable, has a short growth time, provides a good income, and is planted in the early season for high economic efficiency. It is a diverse, easy-to-process, and delicious vegetable that is preferred by consumers. It can be grown in most regions and seasons if there are cultivation measures suitable for the growth conditions of the tree.

Cooperatives in the research area have gradually applied digital technology in vegetable production using QR codes along with digital logs to trace the product origin and to meet VietGAP standards and organic standards, and market demand. In addition to the quality management by external agencies and units, each cooperative establishes a control board to carry out internal quality control according to the cooperative's charter. They operate independently, inspecting and supervising the operation of the cooperatives in accordance with the law and the cooperative's charter. The control board includes five people (one head of the control board and 4 controllers in charge of four small groups in the cooperative) is directly elected by the general meeting of members among the cooperative members. The control board performs the following tasks:

- Supervising the quality of safe production activities of production members and safe vegetable consumption activities of suppliers
- Checking the diary periodically at least once every two weeks/household and notifying them of errors, reminders and handling of violations according to regulations and notifying the list of violating members to the director and,
- Collecting the contribution fund as well as the mistakes made by the group in charge to the treasurer.

In general, with the quality-control process both internally (internal management) and externally (state agencies and projects), safe vegetable products of FFPOs in the study area have met the required quality when sold on the market.

The strict application of VietGAP requirements and standards for organic production contributes to reducing the use of plant protection and using other inputs more effectively. This helps to improve income by 10–20% for farmers and improves the environment and health for women, who are the main workforce in vegetable production and trading.

However, one of the obvious problems with production identified in cooperative surveys is the unevenness in technical expertise among members of the visiting cooperatives. This shows that training in production techniques has not reached all members and that members who have received communication training are unable to communicate to other members. The recent prolonged droughts have also caused cooperatives to stop sowing seeds because there is not enough water to irrigate vegetables.

Regarding post-harvest treatment, classification of vegetable products for distribution to the market is initially carried out at the cooperative. All products are harvested for immediate supply to the market. Vegetables are usually classified according to the right size and price.

6.1.2. Input factors

Input supply is dominated by supply stores/agricultural cooperatives, local agricultural agents, FFF provincial plant seed companies/joint stock companies and agricultural extension centres through various support programmes for farmers. Most vegetable farmers do not use fertiliser in production. The most popular varieties grown are Green Magic cabbage and Copenhagen Market cabbage, Da Lat (a high-yield sweet cabbage), green spoon (Chinese) cabbages, Shanghai cabbage, Japan cabbage and green chrysanthemum. These varieties of vegetables are not only suitable for the climatic and soil conditions of each province but also have high yields and good quality, helping farmers achieve optimal production efficiency. These suppliers of plant varieties, fertilisers, and agricultural materials play an important role in supporting farmers in choosing the right varieties and providing the necessary inputs to improve crop quality and yield. For this value chain, there is limited interaction with input providers because most inputs used are obtained through exchange trade in the community.

One KII interviewee was from Vu Thanh Agricultural Cooperative, Moc Chau town, who specialises in trading seedlings, fertilisers and raw materials for agriculture. According to the interviewee, fertilisers are provided by the cooperative according to the manufacturer's standards, including Vina Cor organic fertiliser in Bac Ninh, and organic fertiliser made from chicken manure. The cooperative also provides seedlings with first-line tree certification;

certificate of origin. In addition, the cooperative also supports planting and caring for vegetable plants such as digging holes and top dressing with fertilisers.

6.1.3. Actors in the vegetables value chain

Popular consumer outlets for vegetables at FFPOs in the study area include traditional markets, supermarkets, convenience stores, and online shopping channels. Consumers frequently buy vegetables on a daily, weekly or monthly basis. A survey by the Natural Safe Vegetable Cooperative under the FFF project shows that, from consumption through the wholesale market in Hanoi, currently about 60% of freshly harvested vegetables are consumed directly by wholesalers and retailers such as MM Mega Market Vietnam, Big C, Aeon and Green Life at the beginning of the year and during the off-season.

Linkages between farmer households and cooperatives are carried out through oral contracts, but no economic contracts are signed. Activities are mainly carried out based on mutual trust, with the cooperative making a plan to direct the volume of product it will buy from each member. The purchase of goods from households is recorded in books or lists and at the end of the month, the cooperatives summarise what they have received and pay money to households. Many vegetable-growing households also buy fertilisers, seeds and pesticides from the cooperative because the price is lower and they know that they are not purchasing counterfeit goods. At the end of the season, they pay for these inputs by deducting from the price from the profits made from the vegetables sold to the cooperative.

Linkage between cooperatives and supermarkets, chain of convenience stores: An annual contract is signed between cooperatives and product suppliers and consumption partners. The scale of association is carried out through orders and delivery invoices, including the quantity, type and purchase price, delivery time and form of payment. Orders are sent by fax or email.

6.1.4. Support for the vegetables value chain

State support

The management of collectively labelled or PGS-certified Eba-FFP vegetable production in Vietnam requires the involvement of multiple state regulatory agencies at the national and local levels. Table 16 is a summary of the main agencies involved in the management of this field.

Table 16. State management of vegetable production

Regulatory authority		**Role**
National level		
Ministry of Agriculture and Rural Development (MARD)	General Department of Crop Production	Managing and guiding the implementation of policies and programmes for the development of agricultural production, including standards for safe and sustainable vegetable production and systems such as PGS.
	Plant Protection Department	Supporting safe agricultural production and encourages biodiversity-friendly practices on farms, which can contribute to EbA goals.
	NAFIQAD	Ensuring quality and food safety in vegetable production, monitoring and certifying quality standards, including PGS.
Ministry of Natural Resources and Environment	Department of Environmental Protection	Managing environmental factors related to agricultural production, monitoring the implementation of environmental standards in the vegetable production process in the direction of sustainability and EbA.
Ministry of Science and Technology	Directorate for Standards, Metrology and Quality	Establishing national standards related to the production and certification of safe vegetable products, including supporting the application of PGS.
Provincial level (Bac Kan, Thai Nguyen, Son La, Hoa Binh, Yen Bai)		
Departments of agriculture and rural development		Managing and guiding the implementation of safe and sustainable vegetable production programmes in the locality, including the implementation of collective brands and PGS. Monitoring and supporting farmers to adopt sustainable agricultural production measures based on EbA.
Departments of industry and trade		Managing at stores, retail markets.
Sub-departments of crop cultivation and plant protection		Managing the input and production stages for production facilities and households in the province/district (checking initial production conditions such as planting area availability, irrigation, presence of heavy metals or E.coli to see if they are eligible for production support including technical training, production tools. Issuing certificates of production establishments

	and production areas that meet food safety conditions in the province/district.
Sub-NAFIQAD departments	Checking pesticide residues and food-safety hygiene conditions in warehouses. Quality self-monitoring chain. Inspection and assessment of classification of production establishments once a year according to Circular 45/2014/TT-BNNPTNT dated 03 December 2014 of the Ministry of Agriculture and Rural Development.
Departments of natural resources and environment	Managing and supervising environmental protection activities in the agricultural production process, especially production activities based on the EbA approach.
Local agricultural associations and cooperatives	Supporting farmers in registering and maintaining collective labels, and coordinating with state agencies in implementing PGS in the locality. Organising training programmes on safe and sustainable agricultural production.

State regulatory agencies at both national and local levels play a vital role in guiding, supervising, and supporting the development of collectively labelled vegetables and promoting practices aligned with an EbA approach. Although PGS certification with an explicit EbA basis is not yet established, close coordination between these agencies is crucial to ensure the success of sustainable agricultural production initiatives in the provinces of Bac Kan, Thai Nguyen, Son La, Hoa Binh, and Yen Bai.

National-level policies

National-level policies to support collectively labelled or PGS vegetable value chains for EbA-FFPs include:

- National Programme on Organic Agriculture (Decision 885/QD-TTg): The government has approved the organic agriculture development plan, which includes financial, technical and policy mechanisms to promote the production of organic vegetables and products that meet PGS standards.
- Decree 109/2018/ND-CP on Organic Agriculture: Regulations on conditions and procedures for certification of organic products, which includes regulations encouraging certification systems such as PGS, especially support for products collectively labelled and produced according to sustainable models.
- National Target Programme on New Rural Development (Decision 1600/QD-TTg):

This programme includes specific criteria related to safe and sustainable agricultural production, emphasising the adoption of agricultural models based on an ecosystem approach. It provides support for cooperatives and farmers in implementing these ecosystem-based practices, enhancing the sustainability and safety of agricultural production.

- Decree 52/2018/ND-CP on High-tech Agricultural Development: Encourages the application of high technology in agricultural production, including safe and sustainable vegetable growing, with financial and technical support for cooperatives and farmers.
- Decision 4765/QD-BNN-TT in 2023: MARD has approved the project to develop safe vegetable production areas, ensure traceability and be associated with processing and consumption markets until 2030. This project aims to create concentrated production areas, and apply science and technology to improve production quality and efficiency. However, farmers in target cooperatives face difficulties in accessing loans due to complicated procedures and high costs for testing land and organic agricultural products, and as they have no collateral. The infrastructure of the production area is still weak and market access is uneven between cooperatives. Provinces near the centre such as Hoa Binh have better conditions for consuming products than provinces far from the centre such as Bac Kan and Son La.

Provincial-level policies

Local policies in the provinces of Bac Kan, Hoa Binh, Yen Bai, Son La, Thai Nguyen include:

- Clean and safe agriculture development programmes: Provinces have issued clean agriculture development plans, which emphasise the support of safe, PGS or collectively labelled vegetable products, and encourage the adoption of sustainable agricultural models based on the EbA approach.
- Policies to support agricultural cooperatives: Provinces have implemented programmes to support agricultural cooperatives in the production, certification, and consumption of safe vegetable products. This policy includes financial, technical and trade promotion support for cooperatives.
- Local agricultural extension programmes: In the provinces, the agricultural extension programmes focus on the transfer of safe and sustainable vegetable production technology, and the training of farmers on PGS. These programmes provide support

with seeds, organic fertilisers and farming techniques.

- Policies to support value chain linkages: Some provinces such as Son La and Hoa Binh have issued policies to support the linkage of agricultural product value chains, including supporting the cost of PGS certification, building collective brands, and promoting trade for safe vegetable products.

Other financial support includes:

- Preferential credit policy: Provinces have coordinated with banks such as Agribank and VBSP to provide preferential credit for farmers and cooperatives participating in safe and sustainable vegetable production.
- Agricultural insurance policies: Some localities are experimenting with or applying agricultural insurance, supporting farmers to reduce risks in the production process, especially in changing climatic conditions.

Policies to support trade promotion:

- Trade promotion and market expansion policies: Provinces organise and participate in fairs and exhibitions of safe agricultural products, supporting farmers and cooperatives to bring safe vegetable products to the domestic and international markets. This policy also includes support for promotional costs, branding, and connecting with major distributors.
- Cooperation programme with enterprises: Provinces encourage cooperation between farmers, cooperatives and domestic and foreign enterprises to expand the consumption market for safe vegetable products.

Box 6. Supportive policies for safe vegetable cooperatives

The application of supportive policies, such as label and packaging design, establishment of a traceability system, and efforts to introduce and promote clean, organic-oriented vegetables into the value chain, has initially helped increase the selling price by 5–10%, expand production scale, and open new distribution channels. These initiatives have brought significant benefits to farmers involved in the vegetable value chain of the Natural Safe Vegetable Cooperative.

Specifically, the Natural Safe Vegetable Cooperative has signed a contract with the Big C supermarket chain to supply 3 tonnes of various vegetables per week. The cooperative has

also collaborated with Thanh Cong Cooperative, Thanh Son Cooperative, and An Tam Cooperative within the province to distribute products such as cauliflower, cabbage, carrots and potatoes. Beyond the supermarket system, the cooperative has partnered with BigStar Company to provide vegetables to the Phu Cuong restaurant chain, delivering 1–2 quintals of assorted vegetables daily.

To further expand production, Natural Safe Vegetable Cooperative has encouraged local residents to establish three cooperative groups, guiding them to replicate the cooperative's successful model. These groups include Ban Hammer Cooperative with 13 members, Ban Ang 2 Cooperative with 9 members, and Ban Ang 3 Cooperative with 7 members. These efforts underline a commitment to clean, organic-oriented vegetable production, bringing added value and benefits to the farmers involved.

Source: Interview with Nguyen Thi Luyen, cooperative director, 2024.

Financial services

Commercial banks such as Agribank, VBSP and microfinance institutions provide preferential credit to farmers and cooperatives that produce safe vegetables. In addition, these financial institutions can provide agricultural insurance, helping farmers reduce risks in production. Funds provided by the state or international organisations, such as the United Nations Development Programme (UNDP) Rural Development Fund, provide financial support for sustainable agricultural production projects, including the implementation and expansion of PGS.

Cooperatives in the research area are supported to maintain and improve production capacity through the support programmes of MARD and the FFF programme. Programmes provide financial and technical support for new rural construction, improving the quality of life and rural economic development, concessional loans for farmers, financial support for agricultural projects (especially crop projects), breeding, and processing of agricultural products. However, the lack of collateral to ensure capital is mainly due to the fact that the land is customary land or land lease. There are also significant difficulties in accessing grants/aid funds due to the complex application process and the limited capacity of many manufacturers to follow this process.

Certification, labelling and traceability services

- Certification bodies: Independent certification organisations, including units under the Directorate for Standards, Metrology and Quality (STAMEQ), as well as international non-governmental organisations such as Control Union and Ecocert, play a crucial role in inspecting and certifying vegetable products that meet PGS standards or collective labelling requirements. While specific EbA standards have not been fully defined in Vietnam, these bodies ensure compliance with general sustainability and environmental standards that align with EbA principles, such as biodiversity conservation and reduced chemical input.
- Traceability services: Companies providing traceability technology, such as SmartAgri and TraceVerified, assist farmers and cooperatives in documenting the entire production process, ensuring transparency from field to fork. These traceability services help enhance product value, build consumer trust, and facilitate access to high-end markets by showcasing adherence to sustainable practices that resonate with EbA-aligned values.

Transportation services

The most economical way to transport vegetable products to market is often through refrigerated trucks provided by local transport companies, which move vegetables efficiently from production sites to distribution points. Shipping costs vary depending on the number of shipments, the type of transportation, and the distance covered. Companies such as Viettel Post, Proship Logistics and local transport units play a crucial role in safely transporting vegetables from production areas to domestic and international markets. These companies must ensure proper shipping conditions to maintain product quality.

Trade promotion ***services***

- Trade promotion agencies: Organisations such as the Trade Promotion Agency, the Vietnam Chamber of Commerce and Industry (VCCI) and international NGOs such as Oxfam play a role in connecting manufacturers with consumer markets, especially international markets. They organise fairs, exhibitions and business networking events to help make safe and sustainable vegetable products accessible to consumers and importers.
- E-commerce platforms: Sendo, Tiki, Lazada and VNPay are platforms that support farmers and cooperatives in bringing products directly to consumers, expanding the

consumption market without intermediaries, and ensuring product traceability.

6.1.5. SWOT analysis of vegetable value chain

Table 17. SWOT analysis of vegetable value chain in the study area

Strengths	**Weakness**
• **High product quality** due to the application of safe production processes such as VietGAP, increasing access to export markets. • The model of **close linkage** from production to consumption ensures stable output and reasonable prices for farmers. • **Strong support** from local authorities and international organisations in terms of capital, technology and markets.	• **Production scale remains small and fragmented**, lacks synchronisation and has not yet created a large specialised production area. • **Difficulties in accessing capital** and new technologies is affecting productivity and product quality. • **Management and organisational capacities of cooperatives are still we**ak, not meeting the requirements of modern and large-scale production development.
Opportunities	**Threats**
• **Increasing demand** for clean and safe vegetables, especially in big cities such as Hanoi, is creating great opportunities for cooperatives to develop production. • **Government has many policies** to support agricultural development, especially financial, technical and training support programmes for cooperatives. • Vietnam's vegetable products have great **potential to be exported to international markets**, if quality and food safety standards are ensured.	• **Climate change** poses many challenges to agricultural production, including extreme weather, pests and reduced crop yields, especially during prolonged drought. • **Market access is still limited** for many cooperatives, especially in cooperatives in areas far from the centre and with poorly developed transport infrastructure. **Competition** from imported products and from other production regions in the country will continue unless cooperatives can improve quality and reduce production costs to compete.

7. Value chain for bamboo shoots in the study area

7.1 Analysis of factors in the bamboo-shoots value chain

Bamboo shoots are an agricultural product harvested from forests or specially cultivated. In provinces such as Son La and Yen Bai, bamboo shoots are of high quality, often harvested seasonally. In addition, bamboo shoots are widely grown in the mountainous areas in the study area, especially in mangrove forests or areas with moist soils. Farmers in these provinces often adopt traditional farming methods, with some places starting to switch to improved bamboo-shoots cultivation. However, the application of new techniques in farming is still limited. The bamboo-shoots value chain map in Figure 9 includes aspects such as raw material sourcing, production processes, processing, distribution and consumption markets.

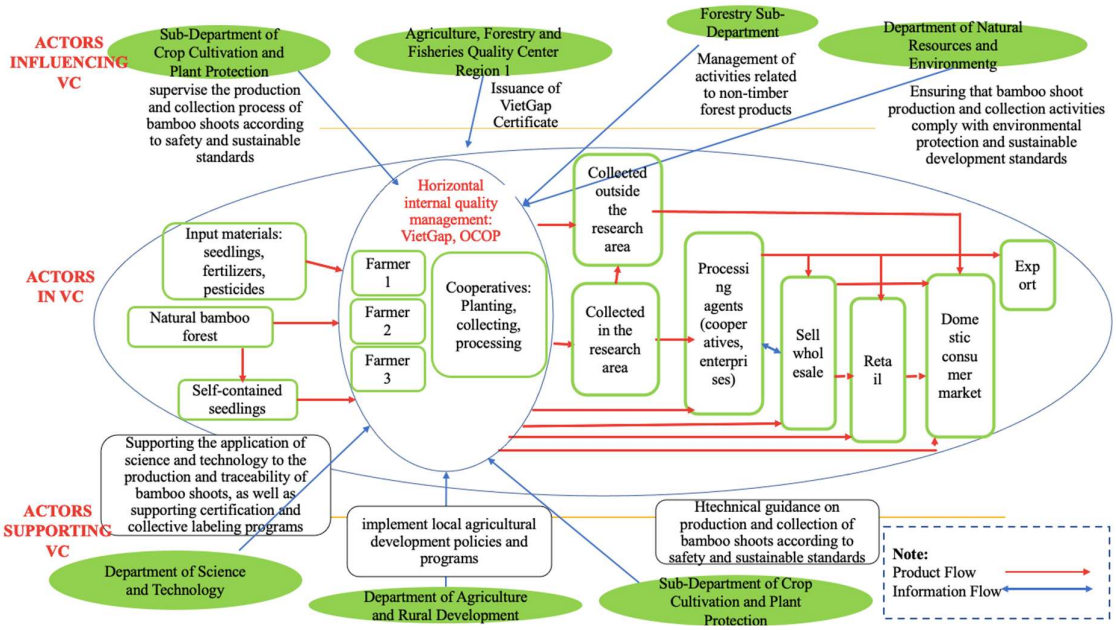


Figure 9. Map of the bamboo shoot value chain for cooperatives in the study area

Source: 2024 field survey data.

7.1.1. Bamboo-shoot producers

Bamboo shoots are harvested by hand by the locals, usually in spring to summer. After harvesting, bamboo shoots are cleaned, the inedible parts removed and the shoots preliminarily processed at facilities near the harvest area. Bamboo shoots can be processed by many different methods such as pickling, canning and drying. The bamboo-shoot processing infrastructure of cooperatives researched in this study is still limited. The majority of bamboo

shoots are processed using traditional methods such as pickling or drying. The preservation of products lacks high-tech measures, leading to high post-harvest losses.

A typical example for this chain is Tan Xuan 269 Cooperative at Tan Xuan commune, Van Ho District, Son La Province. Tan Xuan Commune has a large area of natural bamboo forest, called Ta Lao Forest (about 2,000 hectares) and this is an important source of livelihood for many households in Tan Xuan commune. Tan Xuan 269 Cooperative purchases and processes most of the bamboo shoot products in Tan Xuan commune and applies modern technology to increase the value of bamboo shoots on the market. The cooperative has supported local farmers to plant more Bat Do bamboo shoots on vacant land or depleted areas to maintain bamboo resources. The cooperative has applied Vietnam's product quality certification programmes such as OCOP to expand the market, improve consumption capacity, and contribute to increasing the income of households. In 2021, FFPO's revenue was Vietnamese dong 3 billion, of which profit accounted for 30–35%. Each member has a salary of 5–6 million Vietnamese dong/month (about US$199.20–239.04). In addition, FFPO helps improve income by 10–30% for more than 60 locals by selling products and providing labour to the FFPO.

7.1.2. Input factors

The cooperatives that collect and plant bamboo shoots under the FFF project all have a large area of natural forest – this is their own source of seedlings. Bamboo shoots provide the main source of livelihood for local people, while maintaining bamboo forests also provides firewood, building materials and animal feed, which contributes to reducing deforestation in Tan Xuan commune. Livelihoods based on bamboo resources have encouraged people to protect and expand bamboo areas through sustainable planting and harvesting of bamboo shoots. In addition to natural inputs, cooperatives also plant more types of bamboo shoots such as Bat Do bamboo shoots on vacant land or depleted exploited areas to maintain bamboo resources. For bamboo-shoot planting activities, input materials such as seedlings and fertilisers are purchased by cooperatives from trading companies, agricultural cooperatives, and forest product-processing workshops. Field surveys in the research area show that cooperatives often buy fertilisers from VinaTap company in Thanh Tri, Hanoi and Hoa Phat Agricultural Development Joint Stock Company. Their selection criteria is a standardised, clean and organic fertiliser made from byproducts, such as microbiologically treated bagasse humus and acacia wood sawdust (which can be bought from forest product-processing factories in the district from factories granted FSC certification). Medium micro silicon

fertiliser can be purchased from Tan Phat Bac Giang Company (this company's fertiliser ensures effective quality for plants). Microbiological sources include manure from Tan Phu Organic Hill Chicken Cooperative (a trusted source, although not yet certified). In addition, cooperatives self-supply fertilsier. Old trees are crushed into humus to replace humus such as sawdust, bagasse humus, while incineration produces fertilisers such as biochar and activated carbon.

Processing and consumption activities: Cooperatives in the study area have applied smokeless drying techniques to improve the quality of bamboo shoots in terms of taste, colour and aroma. They also use QR codes to trace the origin of bamboo shoot products. Cooperative members have been able to use digital marketing platforms and e-commerce platforms such as Shopee, Voso, Zalo and Facebook.

7.1.3. Actors in the bamboo shoots value chain

The bamboo shoot distribution system from cooperatives is not really effective. The products are mainly distributed through local markets or traditional markets, with a few being exported. Products are mainly sold directly to consumers (individuals and unions) either at the place of manufacture or over the phone.

Once KII Interviewee from a cooperative said, "In the future [bamboo shoots] will be sold through intermediaries when the output reaches several hundred tonnes. Currently, the total output is 90 tonnes/year of raw bamboo shoots, mainly retailing to consumers only in Thai Nguyen and Hanoi, but the output is extremely small [and] is equivalent to 30–35 tonnes of processing."

7.1.4. Support for the bamboo shoots value chain

National-level state support

State management agencies at the national level relevant to bamboo shoot collection, planting and production include:

- The Ministry of Agriculture and Rural Development and the Department of Crop Production: MARD manages and promulgates policies and regulations related to crop cultivation, including the production of bamboo shoots. This department is responsible for sustainable production standards and planning for bamboo-shoot cultivation in

appropriate ecological regions.

- Plant Protection Department: Manages plant-protection activities, supervises the use of fertilisers and pesticides in bamboo-shoot cultivation to ensure safe and sustainable production.
- Department of Cooperative Economy and Rural Development: Supports the development of cooperatives, production linkage models, and managing the issuance of collective labels or PGS for bamboo-shoot products.
- General Department of Forestry: Manages activities related to non-timber forest products (NTFPs), including bamboo shoots. The department is also involved in protecting forests and maintaining biodiversity, an important part of the EbA approach.
- Ministry of Natural Resources and Environment: Ensures that bamboo-shoot production and collection activities comply with environmental protection and sustainable development standards, especially in environmentally sensitive areas.
- The Ministry of Science and Technology, Directorate for Standards, Metrology and Quality (STAMEQ): Responsible for quality standards, traceability and certification for collectively labelled bamboo shoot products or PGS.

Provincial-level state support

- Sub-departments of agriculture and rural development in Bac Kan, Thai Nguyen, Son La, Hoa Binh, Yen Bai provinces: Responsible for implementing local agricultural development policies and programmes, including bamboo-shoot planting and collection. The department also oversees the implementation of sustainable production models and programmes to support value chain linkages.
- Sub-departments of crop cultivation and plant protection in the provinces: Responsible for providing technical guidance, inspecting and supervising the production and collection of bamboo shoots according to safe and sustainable standards, and supporting certification activities.
- Forestry sub-departments: Manage activities related to forests and NTFPs, including bamboo shoots. The agency is also responsible for the protection and development of forests, an important element in the collection of bamboo shoots under the EbA approach.
- Sub-departments of natural resources and environment (DONRE): Ensure that the collection and planting of bamboo shoots comply with regulations on environmental

protection, supervise the implementation of sustainable standards in the production and exploitation of forest products.

- Sub-departments of science and technology: Support and supervise the application of science and technology to the production and traceability of bamboo shoots, as well as support for certification and collective labelling programmes.

Certification and labelling

Policies aimed at supporting bamboo shoot cultivation and collection in the study area emphasise sustainable development, environmental protection, and establishing a bamboo shoot value chain that can potentially incorporate EbA approaches. These policies are designed to create a favourable framework for developing bamboo shoot products with PGS certification or collective labelling, providing opportunities for farmers and cooperatives to increase product value, expand market access, and enhance competitiveness in both domestic and international markets.

National-level policies to support bamboo shoot planting and collection include:

- Organic Agriculture Development Programme (Decision 885/QD-TTg): The government has approved an organic agriculture development plan, which includes support for the cultivation and collection of NTFPs such as bamboo shoots. This support includes financial, technical and policy mechanisms to promote organic bamboo-shoot production and to meet PGS standards.
- Decree 109/2018/ND-CP on Organic Agriculture: Stipulates the conditions and procedures for certification of organic products, including bamboo shoots. This decree encourages the application of certification systems such as PGS, especially for NTFPs that are collectively labelled and produced according to sustainable models.
- National Target Programme on New Rural Development (Decision 1600/QD-TTg): Supports the development of sustainable agricultural production models, including bamboo-shoot planting and collection. This policy also supports the building and development of product brands, including collective labelling for NTFPs such as bamboo shoots.
- Decree 52/2018/ND-CP on High-tech Agricultural Development: Encourages the application of high technology in agricultural production, including bamboo shoots, with financial and technical support for cooperatives and farmers.
- Programmes to support the conservation and development of NTFPs: The government has many programmes to support the conservation and development of NTFPs, including

bamboo shoots. This policy focuses on maintaining and developing forest ecosystems, and supporting farmers in the sustainable collection and processing of bamboo-shoot products.

Provincial-level support policies in the provinces of Bac Kan, Hoa Binh, Yen Bai, Son La, Thai Nguyen include:

- Sustainable forestry development programmes: These provinces have implemented sustainable forestry development programmes, including measures to support the cultivation and collection of bamboo shoots. These policies emphasise forest protection, biodiversity conservation and sustainable development of NTFPs.
- Clean and Safe Agriculture Development Programmes: Provincial programmes support safe bamboo-shoot production that meets PGS or collective labelling standards, and encourage practices aligned with sustainable agricultural models that could incorporate aspects of EbA in the future.
- Policies to support agricultural and forestry cooperatives: In these provinces, bamboo-shoot production and collection cooperatives are supported financially, technically and with trade promotion. This policy includes direct support for cooperatives in developing the bamboo shoot value chain and achieving PGS certification.
- Agricultural and forestry extension programmes: Provinces focus on training farmers on sustainable bamboo-shoot planting and harvesting techniques, and supporting PGS certification activities and collective labelling for bamboo-shoot products.

Financial services

- Preferential credit policies: Provinces have cooperated with banks and financial institutions to provide preferential credit to farmers and cooperatives participating in a safe and sustainable bamboo shoot value chain.
- Agricultural insurance policies: Some provinces are experimenting with or have implemented agricultural insurance, supporting farmers to reduce risks in the process of producing and collecting bamboo shoots.
- Financial and technical support: Agribank provides credit services and financial support to farmers and cooperatives in the bamboo shoot value chain.
- Microfinance institutions: Provide capital support to small households and cooperatives to invest in production and improve bamboo-shoot quality.
- Agricultural development organisations and NGOs: Organisations such as Oxfam or

the German Agency for International Cooperation (GIZ) often assist in capacity building, providing training and advice to farmers and cooperatives in compliance with sustainability standards and market access.

Trade promotion services

- Trade promotion policies: Provinces regularly organise fairs and exhibitions of agricultural and forest products to support the promotion and consumption of bamboo-shoot products. This policy includes support for promotion, branding and market connection costs for PGS-certified products.
- Policies to support PGS certification and collective marks: Provinces have policies to support the cost of certification, training and building collective brands for bamboo-shoot products. This support includes consulting, financial and technical assistance to cooperatives and farmers.

While current policies establish a foundation for sustainable bamboo shoot value chains, direct application of EbA principles remains limited. However, these policies open the possibility for future EbA integration, providing a pathway to develop bamboo-shoot production that aligns more closely with ecosystem-based approaches.

Agricultural research centres are constantly looking for new methods to improve the quality and efficiency of bamboo-shoot production. The Vietnam Trade Promotion Agency (Vietrade) under the Ministry of Industry and Trade supports trade promotion for agricultural products, including bamboo shoots, through fairs, exhibitions and business connections. NGOs such as SNV (Netherlands Development Organisation) and development projects can support trade promotion for collectively labelled bamboo-shoot products or PGS by connecting with international markets and raising product awareness.

Transportation services

Local transportation companies play a major role in collecting and transporting bamboo shoots from production areas to processing facilities or consumption markets. Sometimes, cooperatives may organise internal transportation or cooperate with transportation companies to ensure bamboo-shoot products are transported on time and in the best conditions.

However, support policies from local and central governments to develop the bamboo-shoot industry are still limited. There should be more policies to encourage investment in processing technology and market development.

7.1.5. SWOT analysis of bamboo shoot value chain

Table 18. SWOT analysis of the bamboo shoot value chain in the study area

Strengths	**Weakness**
• **Rich raw materials:** The target cooperatives all have favourable natural conditions for bamboo shoot cultivation with a large forest area and fertile land. • **Specialising in planting and caring for organic tubers** and producing fully processed products (prepared to the final stage for direct consumption by consumers). • **Bamboo shoot quality:** Bamboo shoots harvested here are famous for their good quality and characteristic taste (such as Bat Do bamboo shoots). **Support from local governments:** Programmes to support farmers from the provincial government, to promote the production and consumption of bamboo shoots.	• **Outdated preservation and processing technology:** Bamboo shoot processing technology still has many limitations, lack of investment in modern technology to enhance added value. • **Brand and marketing limitations:** Lack of strong brand identity, no clear marketing strategy to promote products to a wider market. • **Transport infrastructure is still limited:** Affecting the ability to transport and distribute products, especially during the rainy and flood season.
Opportunities	**Threats**
• **Market demand:** Both domestic and international demand is high for organic and natural products such as bamboo shoots. • **'Green' consumer trends:** Current consumer trends prioritise environmentally friendly and sustainable products. • **Support policies:** The government and international organisations have many support programmes to develop sustainable agriculture, including bamboo shoot planting.	• **Competition from imported products:** Bamboo shoots imported from countries with more advanced processing and preservation technologies can gain an advantage in the market. • **Climate change:** Abnormal weather such as floods and droughts can affect the yield and quality of bamboo shoots. • **Diseases:** Pests and diseases can thrive due to changing climatic conditions, affecting crop health.

8. Conclusions and recommendations

8.1 Summary of the EbA forest and farm products value chains analysis

This summary provides a concise overview of the strengths, weaknesses, opportunities and threats of the value chains for medicinal plants, beekeeping and honey, citrus fruit, vegetables and bamboo shoots in the study area. These value chains play a crucial role in the development of the local economy and contribute to the sustainability of the ecosystem, especially in the context of the need for green growth and climate change adaptation. However, these value chains also face challenges related to resource conservation, brand value enhancement, and meeting the growing market demand for sustainable standards.

Summary for the medicinal plants value chain:

- **Strengths**: The area is rich in a diverse range of medicinal plants, offering great potential for high-value natural products.
- **Weaknesses**: Limited connectivity among participants within the value chain; storage and processing techniques are inconsistent.
- **Opportunities**: Increasing market demand for medicinal products, especially those meeting PGS standards.
- **Threats**: Meeting biodiversity conservation requirements and adhering to sustainable standards are major obstacles.

Summary for the beekeeping/honey value chain

- **Strengths**: Honey has a high value and easy market access.
- **Weaknesses**: The traceability system is not robust, and the natural environment's advantages have not been fully utilised.
- **Opportunities**: Growing demand for clean honey, particularly sustainably certified products.
- **Threats**: High competition and stringent certification requirements.

Summary for the citrus fruit value chain**:**

- **Strengths**: This regional speciality has the potential to increase value through branding and reach the premium market segment.
- **Weaknesses**: Lack of product diversification and deep processing.

- **Opportunities**: High potential to access premium markets, especially if certified organic.
- **Threats**: Vulnerability to climate change impacts and high-quality maintenance requirements.

Summary for the vegetables value chain**:**

- **Strengths**: Meets the modern consumer trend for clean and safe food.
- **Weaknesses**: Limited infrastructure for preservation and quality control.
- **Opportunities**: Growing market demand for safe vegetable products.
- **Threats**: Difficulty in controlling origin and maintaining food-safety standards.

Summary for the bamboo shoots value chain**:**

- **Strengths**: Bamboo shoots are easy to store, have stable commercial value, and are familiar to domestic consumers.
- **Weaknesses**: Production and storage techniques are inconsistent across producers.
- **Opportunities**: Bamboo shoots are a popular product with potential for export expansion.
- **Threats**: Meeting food safety and environmental standards is challenging.

The analysis of EbA-FFPs value chains reveals the diversity and growth potential of products within the study area. However, these value chains still face significant challenges in terms of technology, finance and market access. To achieve sustainable and inclusive development, it is essential to improve management skills, strengthen support in technology and finance, and establish PGS standards to build consumer trust. These factors will be crucial drivers to promote the sustainable development of value chains, meet modern market demands, and support local communities in maintaining and developing sustainable livelihoods.

8.2 Specific recommendations for each value chain

8.2.1. **Medicinal plants value chain**

- **Steps for applying EbA standards**: To sustainably produce medicinal plants, FFPOs need to apply resource-management and environmental-protection practices. First, farmer organisations should conduct soil and water resource assessments to ensure proper utilisation. Then, implement a cultivation process that avoids chemical

fertilisers and pesticides, instead using organic fertilisers and biological methods to maintain the natural properties of medicinal plants.

- **Building a collective label/PGS**: Organisations should establish an internal quality-control system to monitor the production process, thereby building consumer trust. Conduct periodic checks on the quality of medicinal plants to ensure they meet PGS and EbA standards.
- **Utilising traceability and blockchain technology**: Apply blockchain to generate QR codes, allowing consumers to trace the origin of medicinal plants, thereby increasing trust and transparency.

8.2.2. Beekeeping and honey value chain

- **Steps for applying EbA standards**: Organisations need to manage beekeeping under forest canopies effectively, minimising environmental intervention and ensuring the bees' food sources are free from chemical contamination. Limit excessive honey harvesting to maintain bee health and their natural habitat.
- **Building a collective label/PGS**: Develop an internal quality-control process to ensure honey meets PGS standards and is environmentally friendly. Periodic checks affirm the quality and natural origin of the honey.
- **Utilising traceability and blockchain technology**: Blockchain helps verify the origin and production process of honey. Through QR codes, consumers can trace information about the honey's origin.

8.2.3. Citrus fruits value chain

- **Steps for applying EbA standards**: For sustainable fruit production, adopt chemical-free farming methods, using biological measures to maintain the orchard ecosystem. Protect soil and water environments and minimise emissions during production.
- **Building a collective label/PGS**: FFPOs need to establish an internal monitoring system for fruit quality, including routine inspections from cultivation to harvest.
- **Utilising traceability and blockchain technology**: Blockchain helps store and manage origin information, with QR codes allowing consumers to easily trace and verify the origin of fruit.

8.2.4. Vegetables value chain

- **Steps for applying EbA standards**: To produce safe vegetables, farmer organisations

should apply vegetable-growing techniques that do not pollute soil and water, combined with natural pest-control methods. Establish an environmental protection process in production, using organic fertilisers and avoiding preservatives.

- **Building a collective label/PGS**: Set up an internal control system to ensure safe and eco-friendly production processes. FFPOs can implement regular inspections to verify that products meet PGS standards.
- **Utilising traceability and blockchain technology**: Use QR codes and blockchain to document the production process and origin of safe vegetables, allowing consumers to easily check and trust the product.

8.2.5. Bamboo shoots value chain

- **Steps for applying EbA standards**: Farmer organisations should manage sustainable bamboo-shoot harvesting by adhering to extraction practices that do not harm the forest ecosystem. Protecting and regenerating forests after harvest is crucial for long-term bamboo shoot sustainability.
- **Building a collective label/PGS**: Establish a quality-control system for bamboo shoots to ensure sustainable harvesting practices. Regular inspections from extraction to processing help meet PGS standards.
- **Utilising traceability and blockchain technology**: Use QR codes and blockchain to record information about the harvesting and processing process, enabling consumers to trace and trust the quality of forest bamboo shoots.

These recommendations will help FFPOs optimise the value chain, enhance sustainability, and improve product transparency in EbA-FFP value chains.

8.3 Enhancing policy and technical support for EbA forest and farm value chains

8.3.1. Harmonising policy regulations

To effectively support the development of PGS labels and EbA standards, close coordination is needed among policies related to agriculture, industry and technology. Ministries such as agriculture, industry and trade, and science and technology should consider the following:

- **Developing detailed guidelines on PGS/EbA standards and application processes**: These guidelines should clarify criteria and monitoring methods, especially in

agroforestry production. Each sector can contribute to establishing a unified standards framework to increase consistency in implementation.

- **Issuing policies to encourage farmer organisations and cooperatives**: The government should further support policies on tax and fee incentives to encourage these organisations to engage in sustainable production and build PGS labels. Prioritising financial and technological support for organisations that meet the standards will motivate FFPOs.
- **Ensuring cross-sectoral coordination in monitoring and management**: Relevant authorities need to work together to implement technical support and training programmes, ensuring a cross-sectoral approach so that production processes meet sustainable standards from production to consumption of EbA-FFP products.

8.3.2. Financial and technical support for FFPOs

- **Providing funding from government and NGOs**: FFPOs often face financial and technological challenges in meeting PGS standards and traceability requirements. Therefore, government and NGO funds are needed to invest in equipment and infrastructure for sustainable production. Specifically:
    - **Grants or low-interest loans** for sustainable value chain development projects.
    - **Supply of materials and technology**, such as quality inspection equipment and traceability systems.
- **Training and technical consulting**: The government and related organisations can offer training courses on resource management, environmental protection, and the application of new technology (such as blockchain). Courses on traceability and product integrity protection will help FFPOs ensure product quality in line with PGS and EbA standards.
- **Implementing traceability technology and blockchain**: Supporting agencies should provide guidance and equipment to help FFPOs apply blockchain technology and QR codes. This will enable customers to trace detailed product information, thereby enhancing trust and increasing the commercial value of EbA value chain products.

These recommendations not only provide FFPOs with financial and technical support but also improve the transparency and competitiveness of EbA-FFP products in both domestic and international markets.

8.4 Recommendations for stakeholder-engagement strategies

8.4.1. Building networks and organising training

To enhance the understanding and capacity of stakeholders in ecosystem management and sustainable value chains, it is essential to organise training and networking activities as follows:

- **Conducting training workshops**: Workshops should focus on raising awareness and building skills in natural-resource management, sustainable standards and eco-friendly farming methods. These training sessions are not only intended to impart knowledge about EbA standards but also to help farmers and cooperatives gain expertise in managing and protecting soil, water and ecosystems throughout the production process.
- **Stakeholder connection conferences**: Periodic conferences should be organised for production groups, managers, financial service providers and NGOs to share experiences and build long-term support relationships. These conferences can serve as a bridge between producers and the consumer market, fostering connectivity and cooperation among actors within the value chain.

8.4.2. Knowledge-sharing networks and continuous technical support

- **Establishing a connection platform**: Develop a digital platform to connect stakeholders, including farmer organisations, cooperatives and regulatory agencies. This platform may include tools for sharing information and data, allowing users to update their knowledge on sustainable standards, supply chain management skills and product traceability.
- **Providing continuous technical support**: Regular consulting services and training should be implemented to maintain and improve product quality in line with PGS and EbA standards. For example, training on traceability techniques and the application of blockchain technology will help enhance product transparency and build consumer trust.
- **Developing a knowledge sharing network**: Create opportunities for stakeholders to exchange and learn from each other's experiences, such as through online sharing sessions or specialised workshops on sustainable value chains and risk management in production. This network will enable stakeholders to maintain connections and support each other in improving production to meet market demands.

These recommendations will enhance cooperation and sustainable development of the EbA-FFP value chains, ensuring inclusiveness and effectiveness in stakeholder interactions.

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Appendix 1. Study area overview statistics

Entry		Description				
		Bac Kan	**Thai Nguyen**	**Son La**	**Peace**	**Yen Bai**
GPS location		21º48’ to 22º44’ north latitude, 105º26’ to 106º15’ east longitude	20°20’ to 22°25’ north latitude, from 105°25’ to 106°16’ east longitude	20º39’ to 22º02’ north latitude, from 103º11’ to 105º02’ east longitude	104°48’ to 105°40’ east longitude and from 20°19’ to 21°08’ north latitude	21º24’ to 22º16’ north latitude and from 103º56’ to 105º03’ east longitude
Administrative divisions	District level	1 city and 7 districts	3 cities and 6 districts	1 city and 11 districts	1 city and 9 districts	1 city, 1 town, 07 districts
	Commune level	6 wards, 7 townships and 95 communes	41 wards, 10 townships and 126 communes	188 communes, 7 wards and 9 townships	12 wards, 10 townships and 129 communes	150 communes, 13 wards, 10 townships
Average population by sex and rural cities in 2022 (thousand people)	Amount	324.35	1,335.99	1,300.13	875.38	847.25
	Male	165.03	652.26	659.79	440.70	427.31
	Female	159.32	683.72	640.34	434.68	419.93

		Town	73.57	525.56	181.80	222.63	176.65
		Rural	250.79	810.43	1,118.32	652.70	670.60
Number and % of villages with electricity (2020)		Number of villages	1,063	1,809	2,222	1,211	1,127
		Rate of villages with electricity (%)	95.34	100	96.27	100	99.12
Number of rural households (2020)			65,527	248,998	246,764	167,438	168,160
Land use (unit of ha)	Natural soil		485,996	356,282	1,410,983	459,030	689,267
	Soil Type						
	Agricultural land	Current status in 2020	459,756	302,181.03	1,241,950	391,940.55	617,887
		Planning 2030	452,621	283,109.99	1,241,856	380,314.64	606,283
		Increase/Decrease	(7,135)	(19,071.04)	-94	(11,625.91)	(11,604)
	Non-agricultural land	Current status in 2020	20,089	46,786.60	76,242	56,062.18	56,737
		Planning 2030	30,382	66,638	76,242	70,919.00	75,149
		Increase/decrease	10,293	19,851.40	0	14,856.82	18,412

	Unused land	Current status in 2020	6,151	3,228.36	92,791	11.026.90	14,643
		Planning 2030	2,993	2,448	92,791	7,796.00	7,835
		Increase/decrease	(3,158)	(780.36)	0	(3,230.90)	(6,808)
	Functional area						
	Agricultural Production	Current status in 2020	44,542	109,842.70		50,500.54	
		Planning 2030	45,664	100,645.38	133,087	49,590.18	
		Increase/Decrease	1,102	(9,197.32)		(910.36)	
	Forestry	Current status in 2020	413,514	187,196.94		296,865.9	
		Planning 2030	405,280	172,000	694,741	286,106	
		Increase/Decrease	(8,234)	(15,196.94)		(10,759.9)	

Source: Source: General Statistics Office (2020–2022) *https://www.gso.gov.vn*

Appendix 2. Description of the EbA-FFP value chains in this study

STT	Value chain	Description	FFPO producers
1	Vegetables	Including high-value, traditional and non-traditional vegetables such as broccoli, cabbage, oyster mushrooms, cauliflower, tomato, cucumber, eggplant, coffee, celery, bell pepper, zucchini, tomato, mushroom, bo khai. Crops are grown all year round.	Bac Kan: Yen Duong Cooperative, Ta Anh Cooperative, THT Thach Ngoa anise essential oil, Ma Phai Cooperative Son La: Natural Safe Vegetable Cooperative, Dong Sang Organic Agriculture Cooperative Hoa Binh: Hai Dang Hi-tech Organic Cooperative, Tan Lac Son Cooperative Yen Bai: Tan Dong General Service Cooperative
2	Fruit	Including fruit trees such as red pomelo, orange, tangerine, pear, plum, peach, longan, banana, jackfruit, lemon, strawberry.	Bac Kan: Yen Duong Cooperative Thai Nguyen: Viet Bac General Agriculture Cooperative, THT Red Pepper Banana Quan Chu Son La: Dong Sang Organic Agriculture Cooperative Hoa Binh: Hai Dang Hi-tech Organic Cooperative Yen Bai: Thinh Phat Cooperative, Tan Dong General Service Cooperative
3	Natural bamboo shoots and bamboo shoot cultivation	Including types of bamboo shoots such as bando and luc truc bamboo shoots.	Thai Nguyen: Bat Do Bamboo Shoot Cooperative Son La: Tan Xuan 269 Cooperative Hoa Binh: Tan Lac Son Cooperative
4	Medicinal plants	Includes all edible and medicinal plants that are grown or collected in the wild such as *Gynostemma pentaphyllum* and *Solanum procumbens*, velvet anise, cinnamon, star anise, *morinda officinalis*, perilla, purple cassia and ginger.	Bac Kan: Yen Duong Cooperative, Ta Anh Cooperative, THT Thach Ngoa anise essential oil Hoa Binh: Hai Dang Hi-tech Organic Cooperative, Tan Lac Son Cooperative Yen Bai: Dao Thinh Environment and Agricultural Services Cooperative, Tan Dong Medicinal Plant Cooperative

5	Honey and beekeeping under the forest canopy	Afforestation combined with beekeeping for honey under the forest canopy (including honey and beekeeping products).	Hoa Binh: Hai Dang Hi-tech Organic Cooperative, Tu Ne Beekeeping Cooperative Yen Bai: Thinh Phat Cooperative, Tan Dong General Service Cooperative
6	Raising chickens under the forest canopy	Raising chickens under the canopy of planted forests (including all products obtained from chickens including chicken meat, chicken wings, chicken legs, eggs, whole chickens, herb-aged chickens).	Thai Nguyen: Tan Phu Organic Hill Chicken Cooperative, Truong Thuan Service Cooperative Hoa Binh: Hai Dang Hi-tech Organic Cooperative, Yen Bai: Thinh Phat Cooperative
7	Raising silkworms	Includes mulberry trees and silkworm cocoons.	Yen Bai: Dao Thinh Environment and Agricultural Services Cooperative, Tan Dong General Service Cooperative
8	Raising native pigs and pigs under the forest canopy	Includes all products obtained from pigs including meat and other by-products	Bac Kan: Ma Phey Cooperative Thai Nguyen: Viet Bac General Agriculture Cooperative, THT Red Pepper Banana Quan Chu Hoa Binh: Hai Dang Hi-tech Organic Cooperative,
9	Raising cattle (goats, buffaloes, cows)	Includes all products obtained from cattle including milk, meat and other by-products (leather and fertiliser)	Hoa Binh: Hai Dang Hi-tech Organic Cooperative,
10	Planting large-timber forests	Acacia, fatwood, rosewood, bodhi, eucalyptus, Canarium, bamboo forest protection.	Bac Kan: Yen Duong Cooperative, Ta Anh Cooperative, Ma Phai Cooperative

	and protecting forests		Thai Nguyen: Tan Phu Organic Hill Chicken Cooperative, Yen Do Agriculture and Forestry and Service Cooperative, Viet Bac Integrated Agriculture Cooperative, THT Red Pepper Banana Quan Chu Son La: Tan Xuan 269 Cooperative Hoa Binh: Hai Dang Hi-tech Organic Cooperative, Yen Bai: Thinh Phat Cooperative, Tan Dong Medicinal Plant Cooperative, Binh Minh Agriculture and Forestry Cooperative, Tan Nguyen General Service Cooperative, Tan Dong General Service Cooperative

Source: 2024 field survey data.

Appendix 3. Criteria for the selection of the 5 Eba-FFP value chains

Economic scale:

• Assess the economic viability of each step in the agroforestry value chain combined with EbA, considering factors such as input costs, market demand, and potential revenue streams.

• Prioritise the steps with the highest potential for profitability and return on investment, and consider the long-term sustainability of economic activities.

Growth prospects:

• Assess the growth potential and scalability in the agroforestry value chain combined with EbA, taking into account factors such as market expansion opportunities, technological advancements, and capacity building.

• Prioritise steps with the greatest potential to boost economic growth, create job opportunities, and stimulate innovation and entrepreneurship in local communities.

Social impact and inclusivity:

• Consider the social impact of each step in the EbA agroforestry value chain, including aspects such as community engagement, livelihood improvement and social justice.

• Prioritise steps that contribute positively to social development, promote inclusion and empowerment of marginalised groups, and enhance community resilience to the impacts of climate change.

Environmental sustainability (green potential)

• Assess the environmental sustainability of each step in the agroforestry value chain incorporating EbA, including factors such as biodiversity conservation, soil health, water management, and carbon sequestration.

• Prioritise steps to minimise negative environmental impacts, enhance ecosystem resilience, and promote sustainable land management practices, such as agroforestry, soil conservation, and water-efficient agriculture.

Appendix 4. Interview questions for production cooperatives

INTERVIEW FOR PRODUCTION COOPERATIVES
I am ____, a member of the project Community-led Ecosystem-Based Adaptation in Biodiversity Forest Landscapes in Vietnam – Marketing Strategy for EbA labelling. We are conducting a survey to analyse the value chain and provide recommendations and guidelines for the marketing strategy of agroforestry products labelled with EbA quality declarations for selected forest and farm production organisations (FFPOs) in 5 Bac Kan provinces: Thai Nguyen, Hoa Binh, Son La and Yen Bai. We would like to understand your experience in beekeeping/chicken farming in the forest/bamboo shoots/medicinal plant growing/vegetable farming in the forest and producing/processing that farm/growing product, how you use it and for the sellers, we would like to learn more about your business. Any information you provide will be kept strictly confidential and your personal information will not be disclosed to others. We greatly appreciate your participation in this survey. We would like to ask you questions about issues related to: Beekeeping/chicken farming in the forest/bamboo shoot cultivation/medicinal plant growing/fruit and vegetable cultivation in the forest and production/processing of such products: income, marketing, processing, preservation and other issues. At this point, would you like to ask me anything about the survey? Do you want to take this survey? If so, go ahead..... [Note: remember to record the following information]

Part 1. Respondent Information			
Interviewee's name		Age	
Gender		Education	
Cooperative name/THT		Areas and locations of the organisation	
Activities in the value chain (production, processing, distribution, sale, etc)		Position of the interviewee (founder, manager, farmer, etc.)	
Type of interview (face-to-face/indirect)		Interview date	

Interviewer			
Start time		End time	

Type of SP production/processing (circle your answer)

a. Beekeeping and honey production
b. Raising chickens in the forest
c. Growing bamboo shoots
d. Growing herbs
e. Growing fruits and vegetables in the forest
f. Rice
g. Burma
h. Other, please specify:

Part 2. Information to analyse the current situation of the production cooperative

1. Can you describe **the year the cooperative started operating, what are the goals/vision** of your cooperative in the future?

- Year of commencement:

-Goal:

-Eyesight:

2. Has your cooperative transitioned **to sustainable/organic practices**? (Circle your answer)

1= Converted
2= Converting
3= Not Converted

If it has been/is in the process of transitioning, what stakeholders does your cooperative **receive support**? (Circle your answer)

a. District/provincial councils, the government and development partners (may include: district forestry officers, forest ranger department staff, district crop officers, agricultural extension development coordinators, export promotion council, department of industry and trade, department of agriculture, farmers' associations etc)

b. Input provider
c. Financial and insurance institutions
d. Other NGOs/projects (please specify):

3. Some **of the main characteristics** of cooperatives, can you describe your cooperative in terms of size, farming methods and organisational structure? Can you also state the reason why you chose this special cooperative design?

	Description	Reasons to choose
Cooperative scale (ha)		
Farming methods, reason		
How farmers acquire knowledge about farming methods		
Organisational structure		
Legal status		
Ownership of cooperatives and land		
Management responsibilities and risks		

Workforce (number and type of workforce (eg full time/seasonal, family, volunteer), (the relevance of) the professional qualifications of the employees, training provided, division of labour, reason			

4. Are there any **competitors** of the cooperative?

If so, you can name a few competitors (competitors are organisations and cooperatives operating in the same business field and providing similar products/services towards the same target customer base):

Competitors	How does your cooperative stand out from the competition?	Do you think that it be considered a competitor of your cooperative?
1.		
2.		
3.		
4.		
5.		

5. What strengths **does the cooperative have** to help you achieve your goals and make you competitive? (Please list your strengths)

(Strengths are the factors inside the cooperative that are positive or beneficial to help the cooperative achieve its goals. Examples: technical support, access to resources, access to markets and value chains, collaborative connections, certification/accreditation of PGS, OCOP, etc)

6. What can create **problems** in your cooperative? What do your competitors do better than you?

The problem of cooperatives	What do your competitors do better than you?

7. Is there anything in the marketing environment involving suppliers, intermediaries, customers, competitors and the general public that can **help (opportunities)** for your cooperative's ability to produce and sell products?

Opportunities are factors outside the cooperative (business market, society, government, etc.) that are positive or beneficial to help the cooperative achieve its goals. Examples: policy, long-term investment, ecotourism and leisure, market demand for sustainable products, etc)

8. Is there anything in the marketing environment involving suppliers, intermediaries, customers, competitors and the general public that can **affect (threaten)** your cooperative's ability to produce and sell products?

Threats are factors outside the cooperative (business market, society, government, etc) that are negative or make it difficult to achieve your goals. Examples: forest degradation, climate change, pests and diseases, market access, access to capital, insecurity of land use rights, institutional and policy constraints, market and price fluctuations, socio-cultural factors, etc.)

9. Are there any favourable factors **(opportunities)** or disadvantages **(threats)** for your cooperative?

Part 3. Information on value chain analysis and marketing strategy development

I. Combined agroforestry production

10. **What are the products/services** of your cooperative? How do you manufacture products and why?

	Product/service name (crops, livestock, etc)			
Type of product/service (crops, livestock, etc.)				
Purpose				
Production scale				
Peculiarities of cultivation				
What percentage of the cooperative's income **does the main product** contribute in terms of quantity and products (economic **importance**)? Why?				
How do you **dispose** of agricultural by-products or waste? (eg reuse, sale, external disposal)				
Do you offer any **additional products or services**? (non-agricultural activities are carried out, eg workshops) If so, why and what is it about?				

11. How do you **plan** annual production, and what are the important factors for planning?

1	Basis for planning: - Seasonal	

	- Market demand - Production capacity		
2	Involvement of other stakeholders?		
	Consumers		
	Wholesaler		
	Retailers		
	Roadside retailers		
	Traders/intermediaries		
	Government and other development partners		

12. Do you have ideas **for adding value to** your current product (what are your aspirations for your product and production process) and **how do you** add value to your product?

Ideas for adding value to products	How to get there

Do you follow any environmental or social production standards or plans? Why yes or why not? (Tick on your answer)

		1=Yes	2=No	Why?
1	**Internal commitments**			
	Traceability			
	Environmental compatibility			
	Regionality			
	seasonality			
2	**Official standards**			
	Organic PGS			

	OCOP				
	VietGAP				
	Vietnamese National Standards (TCVN)				
	JAS organic				
3	Feasibility of implementation?				

II. Input and supply

13. What kind of supplies **do you have to buy** for your production and where do you buy them from? Can you **describe how you choose** your suppliers and **your relationship** with them?

STT	Types of supplies needed	Which provider?	Criteria for choosing a supplier	Supplier contact	Difficult?
1					
2					
3					
4					
5					

Are there any supplies you can **provide yourself** or do not need to buy?

-
-
-

14. How is agricultural land, labour as well as facilities and machinery used and organised? What is the reason for how you organise each of them?

		How it is organised	Reasons for how you organise each thing
1	Land use, allocation, and space recovery		
2	Number and type of employees (eg full time/seasonal, family, volunteers), (the relevance of) the professional qualifications of the employees, training provided, division of labour		
3	Cooperative facilities (houses, warehouses, other infrastructure etc), the type of machine owned/rented/shared & used, repair & maintenance)		

III. Processing and packaging

15. How and by whom are your products **handled and packaged**? Why?

1	In-house or outsourced processing/packaging	
2	In what form the product is processed/packaged	
3	Materials/machinery used	
4	Innovative packaging	
5	Challenges	

IV. Distribution channels, marketing and sales

16. What sales channels are you using? Please circle the types of cooperative channels you use.

(1) Cooperatives → Consumers
(2) Cooperatives → Retailers → Consumers
(3) Cooperatives → Wholesalers → Consumers
(4) Cooperatives → Retailers → Consumers
(5) Cooperatives → Roadside Retailers → Consumers
(6) Cooperatives → Wholesalers → Roadside Retailers → Consumers
(7) Cooperatives → Retailers → Roadside Retailers → Consumers
(8) Aratdar* → Cooperative → Wholesaler → Retailer → Consumer
(9) Aratdar* → Cooperative → Retailer → Consumer
(10) Aratdar* → Cooperative → Wholesaler → Roadside Retailer → Consumer
(11) Aratdar* → Cooperative → Retailers → Roadside Retailers → Consumers

***Aratdars** are authorised traders, more specifically, who act as commission agents for the storage and sale of various agricultural and forestry products.

Can you tell us why you sell through this distribution channel? Who do you (mostly) sell to? How do you manage logistics (shipping, infrastructure, warehousing, etc)? What difficulties occur when selling your products (for different channels)?

Distribution channel type (according to the ordinal number from 1-11, which ordinal number do you choose? – write	Reasons to choose a channel	Who are the main customers?	How to manage this channel?	What is the difficulty?

the ordinal number)				

Can you estimate revenue, quantity, and labour for each distribution channel?

Distribution channel type (according to the ordinal number from 1-11, which ordinal number do you choose?)	The number of products sold by the distribution channel	Revenue of the distribution channel	Labour used for each distribution channel

17. When **selling directly** to customers, where do you usually sell?

(a) Where you produce

(b) Roadside locations

(c) Farmers' market

(d) Craft market

(e) Marketing in cooperation with other companies (eg, seasonal cooperation at orchards, supermarkets)

18. When selling directly, **how do you receive** your orders?

(a) Telephone

(b) Fax

(c) Regular mail or email

(d) Internet

19. What shipping methods **do you usually use** and at what cost do you get your products to customers?

	Shipping methods	Cost
	(a) Bus by route	
	(b) Postal	
	(c) Specialised vehicles	
	(d) Other	

20. Describe the product marketing activities of the cooperative. What has the cooperative done to add value to its products and how successful have you been?

1	Marketing strategy	
	Value-added **activities** (eg unique customer experiences, storytelling)	
	The role of IT/social media	
	Labelling/certification (eg organic PGS, OCOP, VietGAP, geographical indications, eco-labels)	

	Conveying the philosophy (slogan of the cooperative) and farming method (circular, organic) and its benefits		
	Describe difficulties in finding customers?		

21. **The cost of manufacturing** your product

Cost categories	Cost
Variable costs (are expenses that depend on factors that change the scale of production, including costs of raw materials, direct labour costs, energy costs for production, packaging costs, sales commissions)	
1. Direct cost of raw materials	
2. Direct labour costs	
3. Energy costs	
4. Packaging costs	
5. Sales commissions	
Fixed costs (types of expenses that do not change according to the level of production or revenue of the enterprise, including: including rent, taxes, salaries, depreciation, fees, duties, insurance, etc.)	
Value of leased land	
Return on operating capital (seasonal)	

(business capital is the amount of currency invested to serve the business and production activities of the cooperative)		

22. Post-production cost:

Cost categories	Cost
1. Shipping costs	
2. Loading and unloading costs	
3. Market fees	
4. Personal spending	
5. Informal payments	
6. Other	

23. How to **determine product prices** in your sales channels? To what extent do you think the price is fair/satisfactory (for you as well as for the consumer)?

1	Pricing determination	
	Actual cost/benefit reflected in the price	
2	Is there any difference in price depending on	
	What kind of customer?	
	Sales channel?	
	Product?	
	And if so, why?	
	Which products bring **the highest added value** to you as a manufacturer and why?	

24. How do you **characterise the market** for your product and **your consumers**?

1	**Market characteristics**	
	How competitive is the market?	
	How does this manifest?	
	What are the recent market developments for your products offered?	
	What affects it?	
2	**Consumer characteristics**	
	Why do they buy your product (point of sale)?	

Part 4. Information about differences from conventional systems

25. How is your agroforestry production system **different** from the conventional system and how does this **impact your** cooperative's overall market opportunities?

26. **Characteristics of the production system/product** (eg price, quantity, quality, customer relations, value, knowledge sharing, labour, time, resources, knowledge intensity)

27. To what extent are these characteristics reflected in your pricing and marketing? How is this appreciated by the customer (eg willingness to pay, trust)? To what extent does this affect the competitiveness of your product?

Part 5. Social benefits and impact

28. What are the main benefits of your production system?

29. Focus more on **the intangible/non-monetary outcomes** in your farming system: what **are the three most important social benefits** you have personally experienced since you worked in the agroforestry system? If you had to give up the described benefits, how much are you willing to pay per month (in VND) each time to get them back?

An individual's social impact expressed in monetary form (eg being part of a social network, adopting a healthier lifestyle/diet, improving physical health, doing something useful, being satisfied with a job, learning new skills, being in a restorative natural environment, becoming more relaxed, feeling happier/more confident, etc)

30. Can you also name **three essential outcomes** of cooperatives that bring social benefits to other stakeholder groups? Assuming that these stakeholders will lose the benefits described, what is the maximum monthly amount that your cooperative is willing to compensate them for that loss?

The intangible impact (eg improved awareness of the local area, less waste, etc) on other stakeholders served (eg employees, volunteers, the environment, consumers, suppliers, donors, the public sector, local communities, etc.) is expressed in monetary terms.

Part 6. Developments and financial situation of cooperatives

31. If you **compare the position of cooperatives** today with the early stages, how have cooperatives changed since then and why?

Internal changes	Changes in/caused by the external environment

32. Can you also **describe the evolution of your financial situation**? Now how do you (re)finance your cooperative and how does it take place in the start-up stage?

Profitability, the time of exceeding the break-even level, expenses and main sources of income, why? Financial support (from where?), capital investment, access to	

funds/grants/grants/trust funds, cultivation is the main occupation		
How quickly can your cooperative recover from external shocks/variable costs?		

Part 7. Link-up and challenges

33. What do you think helps **you establish and maintain your production system** and most limits risk?

Motivation (eg, regional support mechanisms, politics, skills, assets, social capital, partnerships and networks, training, learning from others, research projects, communications, etc)	Do you feel supported in the way you do agroforestry by politics, regulation, society, etc?	

34. If not already mentioned as 'motivation': How important is the link with other actors for your cooperative and/or the favourable environment? What exactly is their role?

Subject type (eg political/financial organisations, local economies/communities, other farmers, interest groups, etc.), the role of agents (value chains, advice, information, support, knowledge, etc.)	Value chain linkage: How difficult is it to coordinate and find the right supplier (sub) and buyer (sub)? How do you strike a balance between the autonomy of the cooperative and the need to cooperate with other stakeholders?	

35. What are the **main challenges** you have faced/are you facing?

Challenges For example, financial/political uncertainty, the availability of local/regional infrastructure for key activities, (qualified) available labour, access to and sufficient land, trade-offs between long-term benefits and short-term challenges, etc.	How to overcome

Part 8. Future demand

36. What do you need or need to change to continue to grow and scale your production system?

THANK YOU!

Appendix 5. Interviews questions for other value chain stakeholders (processors, suppliers)

Interviews for other stakeholders in the value chain – processors, distributors, wholesalers/retailers, suppliers
I am ____, a member of the project Community-led Ecosystem-Based Adaptation in Biodiversity Forest Landscapes in Vietnam – Marketing Strategy for EbA labelling. We are conducting a survey to analyse the value chain and provide recommendations and guidelines for the marketing strategy of agroforestry products labelled with EbA quality declarations for selected forest and farm production organisations (FFPOs) in 5 Bac Kan provinces: Thai Nguyen, Hoa Binh, Son La and Yen Bai. We would like to understand your experience in beekeeping/chicken farming in the forest/bamboo shoots/medicinal plant growing/vegetable farming in the forest and producing/processing that farm/growing product, how you use it and for the sellers, we would like to learn more about your business. Any information you provide will be kept strictly confidential and your personal information will not be disclosed to others. We greatly appreciate your participation in this survey. We would like to ask you questions about issues related to: Beekeeping/chicken farming in the forest/bamboo shoot cultivation/medicinal plant growing/fruit and vegetable cultivation in the forest and production/processing of such products: income, marketing, processing, preservation and other issues. At this point, would you like to ask me anything about the survey? Do you want to take this survey? If so, go ahead..... [Note: remember to record the following information]

Part 1. Respondent information			
Name of interviewee		Age	
Gender		Education	
Organisation Name		Areas and locations of case studies	
Activity in the value chain (circle the answer)	a. Processor b. Wholesaler/retailer c. Distributor	Position of the interviewee (circle the answer)	a. Founder b. Manager c. Farmers

	d. Suppliers e. Other, please specify:		d. Others, please specify:
Type of interview (face-to-face/indirect)		Date	
Interviewer		Which production cooperative are you cooperating with?	
Start time		End time	

Part 2. Basic information about the main activities of the organisation/ products and services

Can you **describe the main activities** of your business? What are your products and services?

1. The main activities, products and services of the business
2. Business size (small/medium/large), workforce, machinery and facilities
3. To what extent would you describe your business as organic & sustainable? Do you follow any social and/or environmental standards? Why not?
4. Who do you mainly work with? What is your main market and where?

Part 3. Linking value chains with organic/sustainable production systems

5. When and how did your business **start working with the production cooperative network**? What is the reason for the cooperation?

The occurrence and length of the relationship (long-term/short-term), Reason/motivation for cooperation	
Is it difficult to establish a relationship? If applicable:	

a. By competitors		
b. Strict selection criteria of cooperatives		
c. Production capacity of cooperatives		

6. Can you **outline what products and services you are interested** in when cooperating with the manufacturing cooperative? At the same time, please describe all the activities and inputs (eg materials, assets, knowledge, etc) for this cooperation

Type of product/transaction between stakeholders in the value chain, (value-added) activities and inputs intended for collaboration (eg funding for specific infrastructure/equipment, workforce, specific skills/knowledge needed, etc)	
Are there any **other stakeholders** involved in collaborative activities with your manufacturing cooperative? If yes, how and why?	

7. Can you **describe how you work together** with a network of manufacturing cooperatives? For example, what are the responsibilities of each partner and what agreements have you made with each other?

The nature of the cooperation (eg formal/informal, trust-based), the conditions of the cooperation (eg risk/cost sharing, clearly defined responsibilities, stable exchanges, etc.)	
Who is responsible for planning or making important decisions?	

How fair/satisfactory **do you** rate the agreements made?		

8. How is the **financial arrangement** made? Who decides the price and to what extent do you think that price is fair (for you as well as for the cooperative?

Pricing determination	
Cost-sharing - benefits between the two parties	
Are the costs/benefits really reflected in the price?	

Part 4. Different from traditional value chain collaborators

9. Would you **describe your cooperation** with the manufacturing cooperative as being **different from** your usual partners/suppliers/customers, etc (please apply depending on the value chain location of the stakeholders: production, processing, distribution, etc)?

10. **What are the differences/characteristics of ordinary cooperative** partners compared to the characteristics of the manufacturing cooperative you are cooperating with in terms of price, cost-benefit ratio, quality, value, commitment or standard, product type, etc?

11. How would you describe this collaboration with the intensity of knowledge, time, and resources compared to traditional/conventional collaboration?

12. For wholesalers/retailers: How do the products of the manufacturing cooperative you are cooperating with perform compared to conventional products?

Part 5. Efficiency and social benefits of cooperation

13. How does collaborating with a manufacturing cooperative **affect your business**? (Positive/negative impact on the business activities of stakeholders including economically, socially, and environmentally)

	Positive	Negative
Economically		
Socially		

Environmentally			

14. Describe the **intangible/non-monetary outcomes** of this cooperation

What are the intangible/non-monetary impacts of this cooperation? (eg more social/environmental commitment, contributing to improving the local environment, new skills, awareness of environmental issues, producing less waste, etc)

What are the three most important social benefits your business receives from partnering with the XY case study?	What is the maximum amount (in VND) that your company is willing to invest per month so as not to lose each of the described impacts?

Part 6. Impact factors and barriers

15. What factors do you think help you establish and maintain the most successful cooperation with the manufacturing cooperative you are cooperating with?

Internal and external motivations (eg similar values, skills, social capital, personal relationships, regional support mechanisms, politics, subsidies, changes in demand/competition, market entry etc)

Inner motivation	External motivation

16. Are there any specific difficulties or challenges that arise related to your cooperation with the manufacturing cooperative you are cooperating with? If so, what are the difficulties and why?

For example, dependencies, delivery bottlenecks, sales opportunities, lack of awareness/appreciation of other stakeholders in the value chain, financial/political uncertainty, the availability of local/regional infrastructure for key activities, (qualified) available labour, trade-offs between long-term benefits and short-term challenges, etc.

Difficulties and challenges	How did you overcome these challenges?

Part 7. Future plans and needs

17. What do you need or need to change to overcome the challenges mentioned?

18. How do you see the future of your cooperation with the manufacturing cooperative you are cooperating with?

Future plans in cooperation, future challenges/market developments, etc.

Thank you very much!

Appendix 6. Interviews questions for other stakeholders (local authorities)

INTERVIEWS FOR OTHER STAKEHOLDERS – LOCAL AUTHORITIES, SPONSORING ORGANISATIONS, LOCAL COMMUNITY GROUPS
I am ____, a member of the project Community-led Ecosystem-Based Adaptation in Biodiversity Forest Landscapes in Vietnam – Marketing Strategy for EbA labelling. We are conducting a survey to analyse the value chain and provide recommendations and guidelines for the marketing strategy of agroforestry products labelled with EbA quality declarations for selected forest and farm production organisations (FFPOs) in 5 Bac Kan provinces: Thai Nguyen, Hoa Binh, Son La and Yen Bai. We would like to understand your experience in beekeeping/chicken farming in the forest/bamboo shoots/medicinal plant growing/vegetable farming in the forest and producing/processing that farm/growing product, how you use it and for the sellers, we would like to learn more about your business. Any information you provide will be kept strictly confidential and your personal information will not be disclosed to others. We greatly appreciate your participation in this survey. We would like to ask you questions about issues related to: Beekeeping/chicken farming in the forest/bamboo shoot cultivation/medicinal plant growing/fruit and vegetable cultivation in the forest and production/processing of such products: income, marketing, processing, preservation and other issues. At this point, would you like to ask me anything about the survey? Do you want to take this survey? If so, go ahead..... [Note: remember to record the following information]

Part 1. Respondent Information			
Name of interviewee		Age	
Gender		Education	
Organisation name		Areas and locations of case studies	

Stakeholder type (circle answer)	f. Local government g. Sponsor h. Local community groups i. Other, specify	Position and role of the interviewee (circle the answer)	a. Commune leaders b. Representatives of the cooperative alliance c. Local forest rangers d. Officials of the department of agriculture/department of industry and trade e. Provincial promoter f. Representatives of commune farmers' associations g. Other, please specify
Interview Type		Date	
Interviewer			
Start time		End time	

Part 2. Basic information about the main activities of the organisation

1. Can you describe **the main purpose** and **target group** as well as the **main activities** of your organisation/department?

Goals & audience groups, key activities		
What level do you work at? (local/regional/country)		
If the stakeholder is a support network/interest group: Can you describe your membership structure in terms of the number and group of stakeholders? What is their motivation to become a member?		

Part 3. General trends and developments (only ask if it is suitable for the stakeholder area of expertise)

2. What do local/regional/national policy mechanisms do for integrated agroforestry production systems?

Please contact the specific case of the network of producers/agroforestry cooperatives (applicable depending on your case study)

Trends in policy mechanism action aimed at industry development (eg subsidies, special taxes or existing programmes, incentives, regulations, etc), why yes/why not? If there is no specific action related to the specific case study, is there a plan to promote that?	
How are these policy mechanisms perceived and actively used by manufacturers?	
How successful do you consider these measures, mechanisms and policies?	
Where do you see **gaps or difficulties**?	
What do you consider to be the **main burden for farmers** in **accessing** existing support policy mechanisms?	

3. Can you describe **some common characteristics of a typical agroforestry producer/cooperative** network (applicable depending on your case study)? Please refer specifically to the internal organisation as well as the design of the value chain.

Internal organisation

Legal location	
Ownership of cooperatives and land	
Applicable standards	
Management responsibility & risk	

Workforce	

Length of the value chain (participating actors)	
Farming practices	
Distribution channels	
Relationship between agents	
Pricing	
What are the typical challenges and benefits?	
What are the main factors that lead to success?	

Part 4. Relevance to case studies

4. What is your connection to the XY case study? Can you also outline how and why these links came into being?

Link to case study, appearance, reason	
How do you work together/support them? Why is it important?	
What agreements did you have with each other?	

5. **What changes** could have been achieved through your support/work with the XY case study? What helped you achieve these changes?

Achievements over time, influencing factors	

Why are these changes important?		

Part 5. Social welfare

6. Describe the **intangible/non-monetary outcomes** of this cooperation

What are the intangible impacts of cooperation? (eg spreading the idea of organising more cooperatives to serve the local community, more social/environmental commitment, contributing to environmental improvement/local development, creating jobs for people in socially disadvantaged circumstances, environmental awareness, etc)

What are the three most important social benefits from your organisation's perspective from this collaboration?	Can you also outline how these impacts relate to your organisation's purpose?

7. **What is the maximum** amount (in VND) that your organisation is willing to invest in a month so as not to lose each of the described social benefits?

The intangible impact of cooperation expressed in currency	
Give the interviewee an example: 'In order not to lose the effect of accessing local food supplies for rural communities, my organisation is willing to pay up to 15 million VND a month.'	

Part 6. Impact factors and barriers

8. What do you think helped you establish and maintain the most successful cooperation with the XY cooperative/producer network?

Internal and external motivations (eg similar values, skills, social capital, personal relationships, regional support mechanisms, politics, subsidies, changes in demand/competition, market entry, etc.)

Inner motivation	External motivation

9. Are there any **specific difficulties or challenges** that arise related to your cooperation with the XY network of cooperatives/producers? If so, what are the difficulties and why?

For example, dependencies, delivery bottlenecks, sales opportunities, lack of awareness/appreciation of other stakeholders in the value chain, financial/political uncertainty, the availability of local/regional infrastructure for key activities, (qualified) available labour, trade-offs between long-term benefits and short-term challenges, etc.

Difficulties and challenges	How did you overcome these challenges?

Part 7. Future plans and needs

10. What do you **need or need to change** to overcome the challenges mentioned?

11. How do you see **the future of your cooperation** with the XY cooperative network/producers?

Future plans in cooperation, future challenges/market developments, etc.

Thank you very much!

Appendix 7. Focus group discussion tool

FOCUS GROUP DISCUSSIONS

(cooperative members, representatives from farmers' unions and other related subjects)

I am ____, a member of the project Community-led Ecosystem-Based Adaptation in Biodiversity Forest Landscapes in Vietnam – Marketing Strategy for EbA labelling. We are conducting a survey to analyse the value chain and provide recommendations and guidelines for the marketing strategy of agroforestry products labelled with EbA quality declarations for selected forest and farm production organisations (FFPOs) in 5 Bac Kan provinces: Thai Nguyen, Hoa Binh, Son La and Yen Bai.

We would like to understand your experience in beekeeping/chicken farming in the forest/bamboo shoots/medicinal plant growing/vegetable farming in the forest and producing/processing that farm/growing product, how you use it and for the sellers, we would like to learn more about your business. Any information you provide will be kept strictly confidential and your personal information will not be disclosed to others. We greatly appreciate your participation in this survey. We would like to ask you questions about issues related to: Beekeeping/chicken farming in the forest/bamboo shoot cultivation/medicinal plant growing/fruit and vegetable cultivation in the forest and production/processing of such products: income, marketing, processing, preservation and other issues. At this point, would you like to ask me anything about the FGD?

Do you want to take part in this FGD? If so, go ahead.....

[Note: remember to record the following information]

1. SOCIAL DEMOGRAPHIC DATA

District:		Code:	Male	Female

(Code A) The value chain that your team is involved in (circle your answer):

a. Beekeeping and honey production
b. Raising chickens in the forest
c. Growing bamboo shoots
d. Growing herbs
e. Growing fruits and vegetables in the forest

f. Rice
g. Burma
h. Other, please specify:

2. PRODUCTION AND PROCESSING OF PRODUCTS

a) What service organisations are currently **implementing** [Code A] programmes in the district and what kinds of activities are they engaging in (consultancy, technical, etc)?

	Organisation/department name	Nature of the programme	Beneficiaries
Government			
NGOs			
Financial and insurance institutions			
Other			

b) Who are **the key players** in the value chain, including input suppliers, producers, processors and buyers (sellers, traders and other middlemen) in both target districts and nationally, their roles and relevance? What is their relationship and affiliation?

Role	Relevance	Relationship	Link
Input provider			
Manufacturer			

Processor				
Buyers (sellers, traders, and other middlemen)				

c) i) Who do you think makes the most money along the [Code A] value chain?

c) ii) What actions can be taken to remedy any identified imbalances?

d) What farmer groups in the [Code A] value chain are existing or active in your area?

	Internal strengths	Internal weaknesses	External opportunities	External threats
Expanded organisational team name:				

Farmers' association name:				
FFPO farmer name:				
Other (specify) name:				
(Description of the farmer group, continued)				
	Members (Male and female)	What types of training/activities are needed to improve the capacity of these farmer groups?		
Expanded organisational team name:				
Farmers' association name:				
FFPO farmer name:				
Other (specify) name:				

e) **What opportunities and/or potentials** can key players take advantage of to improve the value chain?

Opportunities	Which main actors participate?
1	
2	
3	
4	
5	

f) What **opportunities, limitations and risks** in the business environment and/or along the value chain need to be specifically addressed at product development, production, input provision, pricing, access to finance, marketing and infrastructure levels to increase the supply and availability of the product? What corrective actions need to be taken to implement an effective value chain framework?

	Opportunity	Limitations and risks	Corrective action
Product development			
Production			
Provide input			
Pricing			
Access to finance			
Marketing			
Infrastructure			

3. MARKET

a) **What is your experience** in **selling main products and by-products** to your market?

Who do you sell to? Name and type of buyer:	What do they want to buy?	In what form of preparation do they want to buy it?	What packaging size do they want?	What difficulties do you face in meeting these needs?
1				
2				
3				
4				

b) What is the most important market in the district, province, region (Northeast, Northwest), ASEAN country and region for the product to be sold on the market?

• What are **the strengths and opportunities** in the respective product market segments, including funding links, collaboration opportunities, and how can they be tapped to benefit the beneficiaries of the project?

• And therefore, **what are the challenges and limitations** in these end markets for the target manufacturers?

• What are **the characteristics of demand in these markets**, including consumer preferences?

Final market	Strengths and opportunities	Challenges & limitations	Characteristics of demand
District			
Province			
Area			
Country			
ASEAN Region			

4. GROSS PROFIT MARGIN

I. Income

Items on sale	**Amount**	**Price**	**Total revenue**
II. Variable costs			
Categories and examples	**Amount**	**Unit Cost**	**Total cost**
Input (non-labour) Packaging Stamps and labels			
Labour 1. Management and care 2. Harvesting 3. Processing			
Outsourcing (non-labour)			

Packaging & storage, adhesives, portable tapes, labels			
Transportation (non-labour), inputs, to markets			
OTHER·Receipt book			
Total variable costs			
Gross profit margin of the cooperative (total revenue - total variable costs):			
Output per unit (total profit/quantity or output per unit):			

In addition to the main product in the [Code A] value chain, what other sub-products are created from the main product?

• What is the proportion of revenue of each product?

• Which product is more profitable?

• What is the market share of farmers and other participants for each product?

Sub-product categories	Proportion of revenue	Product benefits	Market share of farmers and other participants
1			
2			

3				
4				

What are the job opportunities and access to production factors (forests/land, labour, capital, etc) by entrepreneurs along the value chain?

How are the different participants in the value chain linked to each other?

What programmes (government, NGOs, businesses) are there in the value chain in the district?

- How can coordination be developed with the current programme?
- Have you ever worked on a [Code A] project before, in one district or another? Note that a 'project' can be a business project.
- What lessons have you learnt from other programmes on products in the value chain?
- What contact can you recommend to us?

Who are the key product groups that can benefit from the program in the district?

Outline strengths, weaknesses, opportunities, and threats (including business competencies, please give examples)

What programmes have worked with other programmes in the past/currently? Indicate which projects/programmes they have worked on.

THANK YOU!

Appendix 8. List of interviewees

1. List of cooperatives interviewed

Stt	Interviewee's name	Gender	Year of birth	Working position	Unit
	BAC BANK				
1	Ma Hoang Ta	Male	1960	Director	Ta Anh Cooperative, My Phuong Commune, Bac Kan Province
2	Dong Van Tong	Male	1958	Deputy Director	
3	Duong Van Bao	Male	1984	Cooperative members	
4	Hoang Thi Nguyet	Female	1989	Cooperative members	Di Linh Integrated Agriculture and Forestry Cooperative, Ba Be, Bac Kan
5	Trieu Van Nghi	Male	1991	Deputy Director	
6	Hoang Van Du	Male	1977	Beekeeping team leader	
7	Nong Van Danh	Male	1993	TV HDQT HTX	
8	Hoang Van Thu	Male	1991	Director	
9	Ma Thi Ninh	Female	1984	Director	Yen Duong Cooperative, Yen Duong Commune, Ba Be District, Bac Kan
	THAI NGUYEN				
10	Lam Xuan Quang	Male	1978	Director	Van Loc Agricultural Products Cooperative, Cay Thi Commune, Dai Tu District, Thai Nguyen
11	Truong Duc Vinh	Male	1979	Director	Quan Thai Tea Cooperative, Quan Chu Commune, Dai Tu District, Thai Nguyen
	SON LA				

12	Vi Van Tung	Male	1976	Director	Dong Sang Agricultural and Organic Cooperative, Moc Chau Town, Son La
13	Nguyen Thi Luyen	Female	1952	Chairman of the Board of Directors	Natural Safe Vegetable Cooperative, Moc Chau Town, Son La
14	A Cao			Director	A Cao Cooperative, Van Ho Son La
	HOA BINH				
15	Half	Male		Director	Tan Lac Son Forestry Cooperative, Man Duc Commune, Tan Lac District, Hoa Binh
16	Tran Hong Nang	Female		Director	Tan Dong Organic Pomelo Cultivation and Agricultural Service Cooperative, Dong Lai Commune, Tan Lac District, Hoa Binh
17	Tran Thi Tham	Female		Director	Hai Dang Hi-tech Organic Agriculture Cooperative, Lac Thuy District, Hoa Binh
	YEN BAI				
18	Tran Thi Hien	Female	1986	Director	Tien Thanh T&T Cooperative, Dao Thinh Commune, Tran Yen District, Yen Bai
19	Ha Thi Nhung	Female	1946	Director	Cinnamon and Medicinal Cooperatives in Hung Thinh Commune, Tran Yen, Yen Bai
20	Mai Van Tinh	Male	1985	Director	Fruit Tree Cooperative
21	Ha Van Giap	Male	1974	Cooperative members	Fruit Tree Cooperative
22	Ha Van Cai	Male	1981	Cooperative members	Cinnamon and Medicinal Cooperatives in Hung Thinh Commune, Tran Yen, Yen Bai

23	Nguyen Trong Nghia	Male	1971	Cooperative members	Cinnamon and Medicinal Cooperatives in Hung Thinh Commune, Tran Yen, Yen Bai

2. List of stakeholders in the value chain

STT	INTERVIEWEE'S NAME	GENDER	YEAR OF BIRTH	WORKING POSITION	UNIT
1	Vu Thi Nga	Female	1976	Director	Vu Thanh Agricultural Cooperative, Moc Chau, Son La
2	Giang Thi Giang	Female	1977	Education Center Supporting Farmers	Safe Agricultural Products Store of Son La Province
3	Thai Anh Tuan	Male	1980	Founder	TPS Tam Dat store chain, Hanoi
4	Nguyen Tien Hung	Male	1978	Founder	TPS Biggreen store chain, Hanoi
5	Nguyen Van Hau	Male	1980	Founder	TPS Sea Wolf store chain, Hanoi
6	Tran Manh Chien	Male	1974	Founder	Uncle Shrimp System

3. List of stakeholders outside the value chain

STT	INTERVIEWEE'S NAME	GENDER	YEAR OF BIRTH	WORKING POSITION	UNIT
	BAC BANK				
1	Hoang Thi Ly	Female	1981	Vice Chairman of the People's Committee	People's Committee of Di Linh commune, district, Bac Kan province

2	Dinh Lam Sang	Male	1966	Deputy Director	Department of Industry and Trade of Bac Kan Province
3	Nguyen Cong Lunh	Male	1976	Vice President	Farmers' Association of Bac Kan Province
4	Vi Van Binh	Male	1980	Chairman of the Commune People's Committee	Farmers' Association of Di Linh commune, district, Bac Kan province
5	Duong Xuan Truong	Male	1979	Head of Department	Department of Agriculture of Ba Be District, Bac Kan Province
	THAI NGUYEN				
6	Le Dam Ngoc	Male	1979	Deputy Head of the Department, Deputy Director of the Center	Thai Nguyen Provincial Farmers' Association
7	Dinh Thi Thu Huong	Female	1982	Deputy Head of Agriculture Department	Agriculture Department of Dai Tu District, Thai Nguyen Province
	SON LA				
8	Nguyen Huy Anh	Male	1977	President	Son La Farmers' Association
9	Ha Thi Than	Female	1980	Chairman of HPN, former chairman of HND	Van Ho District Women's Union
10	Dang Phi Hung	Male	1971	Chairman of the Commune People's Committee	People's Committee of Van Ho commune, Van Ho district, Son La
11	Tong Van Suong	Male	1980	Vice Chairman of the Farmers' Association	Farmers' Association of Van Ho district, Son La
12	Tong Van Minh	Male	1984	Chairman of the People's Committee	People's Committee of Van Ho District, Son La

13	Thai Ba Sinh	Male		Head of Department	Department of Agriculture of Van Ho District, Son La
	PEACE				
14	Bui Van Lua	Male	1979	Deputy Head of Department	Department of Agriculture of Tan Lac district
15	Bui Van Thao	Male	1984	Vice Chairman of the People's Committee	Thanh Hui Commune People's Committee
16	Bui Van Thuan	Male	1965	Vice Chairman of the Farmers' Association	Thanh Hui commune
17	Bui Van Son	Male	1982	Commune Extension Officer	Thanh Hui commune
18	Zhou Hongtai	Male	1979	Chairman of HNDTAN Lac	Tan Lac District, Hoa Binh
19	Bui Van Thai				Tu Ne Commune People's Committee
	YEN BAI				
20	Nguyen Thi Phuong Dong	Female	1977	Vice Chairman of the Provincial Farmers' Association	Farmers' Association of Yen Bai province
21	Nguyen Thanh The	Male	1976	Vice President	Cooperative Union of Yen Bai Province
22	Kieu Tu Giang	Male	1966	Director of the Sub-Department	Forest Ranger District of Yen Bai Province
23	Do Thanh Tung	Male	1973	Head of the Socio-Economic Committee	Farmers' Association of Yen Bai province

24	Nguyen Van Truong	Male	1975	Specialist in charge of agriculture and forestry	Department of Agriculture of Tran Yen district
25	Hoang Van Giap	Male	1984	Cadastral, Construction and Environment Officer	People's Committee of Dao Thinh Commune, Tran Yen, Yen Bai
26	Nguyen Thu Nguyet	Female	1990	Vice Chairman of the Farmers' Association	Dao Thinh commune, Tran Yen, Yen Bai

Appendix 9. Selection of FFPs to develop value chains in FFF provinces

Product	Economic scale		Growth outlook			Social impact and inclusivity			Environmental sustainability			Overall Score	GPA
	Output	Revenue potential	Market expansion opportunities	Capacity building	Job creation opportunities	Community involvement	Improving livelihoods	Community resilience	Biodiversity conservation	Land conservation and water-saving agriculture	Carbon absorption		
Fruits and vegetables	4	4	4	3	4	4	4	4	4	3	3	41	3.73
Fruit	3	3	3	3	5	5	5	5	4	4	3	43	3.91
Natural bamboo shoots and bamboo shoot cultivation	3	3	3	3	4	4	3	3	3	3	4	36	3.27

Medicinal herbs	4	4	4	3	4	3	4	4	4	4	4	42	3.82
Beekeeping under the forest canopy	4	3	4	3	4	4	4	3	3	3	3	38	3.45
Raising chickens under the forest canopy	3	3	2	3	3	3	3	3	4	3	1	31	2.82
Raising silkworms	2	2	2	2	3	3	3	3	3	3	2	28	2.55
Raising native pigs and pigs under the forest canopy	2	2	2	3	2	2	2	3	3	3	3	27	2.45
Raising cattle (goats, buffaloes, cows)	2	2	2	3	2	2	2	2	2	2	3	24	2.18

Planting large timber forests and protecting forests	4	3	3	3	3	3	3	3	3	3	3	34	3.09

Source: Compiled from focus group discussions in FFF provinces

Appendix 10. Project areas of the value chains and income-generating activities

STT	Value Chain	Project Area				
		Bac Kan	**Thai Nguyen**	**Son La**	**Peace**	**Yen Bai**
1	Fruits and vegetables	x		x	x	x
2	Fruit	x	x	x	x	x
3	Natural bamboo shoots and bamboo shoot cultivation		x	x	x	
4	Medicinal herbs	x			x	x
5	Beekeeping under the forest canopy				x	x
6	Raising chickens under the forest canopy		x		x	x
7	Raising silkworms					x

8	Raising native pigs and pigs under the forest canopy	x	x		x	
9	Raising cattle (goats, buffaloes, cows)				x	
10	Planting large timber forests and protecting forests	x	x	x	x	x

Source: Research team synthesised from FFF Report, 2023