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Contents

1	Acknowledgments	3
2	Executive summary	4
3	Background.....	9
4	Objectives	10
5	Methodology	11
6	Achievements against activities and outputs/milestones	13
7	Key results and discussion	15
7.1	Key results of the consultation and ToC workshop in Son La province and discussion....	15
7.2	Key results of the consultation and ToC workshop Houaphanh province and discussion	21
7.3	Theory of Change for a climate change resilient, market-oriented and sustainable crop-livestock smallholder farming system in Houaphanh and Phong Sa Ly provinces ...	28
8	Impacts	33
8.1	Scientific impacts – now and in 5 years	34
8.2	Capacity impacts – now and in 5 years	34
8.3	Community impacts – now and in 5 years	34
8.4	Communication and dissemination activities	34
9	Conclusions and recommendations	35
10	Appendixes	37
10.1	Appendix 1: Report on pre-workshop consultation in Son La Province 2-5 June 2022	37
10.2	Appendix 2: Report on ToC consultation workshop in Son La Province 8 June 2022	49
10.3	Appendix 3: Report on ToC consultation workshop in Houaphanh Province from 9 th to 11 th August 2022 and consultation process from 7 th to 11 th November 2022.....	57
10.4	Appendix 4: Analysis of strategies, development plans, policies, laws and legislations supporting agricultural development.....	87

1 Acknowledgements

This report represents the process and outcomes from a collaboration between Vietnamese, Laotian, French and Australian researchers, private sector representatives, government officials and farmers from Son La province, Vietnam and Houaphanh province, Lao PDR. Together, this team has developed a Theory of Change for development of a climate change resilient, market-oriented and sustainable crop-livestock smallholder farming system integrating the production of maize, legumes and grasses with improved beef cattle and buffalo husbandry in Houaphanh and Phong Sa Ly, Lao PDR. Information from the Vietnamese workshops and consultation discussed in this report have also contributed to the development of a broader ASSET- Flagship Theory of Change document developed for Son La and Dien Bien provinces in Vietnam.

We thank all participants for their time and valuable contributions.

2 Executive summary

Consultations were undertaken with stakeholders in Yen Chau, Moc Chau and Van Ho districts in Son La province, Vietnam and in Sop Bao, Xiengkho and Et in Houaphanh province, Lao PDR. These were followed by stakeholder workshops in Son La and Houaphanh provinces, where it became clear that the future development needs in the two study locations were very different. In Son La province the development focus has been on fruit production in all districts, with Moc Chau and Van Ho districts also developing vegetable production. In Houaphanh province, commercial production has been focused on maize, and to a much lesser extent on cattle, with rice and horticultural crops for subsistence. The Houaphanh provincial and district governments are still focusing on improving maize production in terms of productivity and environmental sustainability, while they also have aspirations to improve livestock and fruit production. Given the very different development situations in Son La and Houaphanh, the research team decided that separate ToC's were necessary for each province. The CIRAD-led ASSET project was already developing a ToC for Son La and Dien Bien provinces, so while our team contributed to its development, we focused most of our efforts on developing the ToC for Houaphanh province. Development of the Houaphanh ToC required input from various stakeholders from Vietnam, including traders, input providers and research and education institutions.

ToC consultations for Son La Province, Vietnam

The consultation and stakeholder workshops in Son La confirmed that there has been a strong focus on replacement of annual crops like maize with perennial crops, to reduce price instability and reduce erosion and land degradation, with fruit trees a major focus. This has seen large-scale development of mango (18,918 ha), longan (18,702 ha), plums (11,507 ha) and H'mong apples (12,126 ha) in the province. However, this has been based on a few or often single varieties, and resulted in overproduction and a significant reduction in price and farmers' income. While the prices paid for good quality fruit remain high, especially if produced following protocols that guarantee food safety (VietGAP, GlobalGAP and organic) and that can meet the requirements of high-value domestic markets and export, low quality fruit makes up the majority of production in Son La. The low prices for these lesser quality products challenge the profitability of these perennial cropping systems. In response to this situation, local governments have succeeded in attracting large fruit processing companies to Son La, while medium and small-scale enterprises and cooperatives have also flourished. Four large processing factories have been built in recent years, and these now provide a more stable market for low-quality fruit. However, during the consultation process it became clear that there are conflicting views and interests between farmers and processors. Processors were attracted to invest in Son La because of the abundance of low-priced fruit, while farmers' had expectations that prices would significantly rise because of the increase in demand for fruit for processing. There is a clear need for facilitation between farmers and processors, and traders who are acting as intermediaries, to agree on prices that allow profitable fruit production and processing. From our observations during the consultation process, there are unrealistic expectations from farmers about the price that processors can pay, but there are also predatory behaviours, especially from intermediary traders, who are taking advantage of the abundant fruit supply. Farmers need to improve their productivity by optimising inputs and labour investment and implementing production protocols that target processing fruit quality. What is currently happening is that farmers are dumping fruit that does not meet the fresh fruit market requirements to processors. There is a real need for research projects to address knowledge gaps and the lack of skills in the production of processing-quality fruit. Nearly all projects, including our ACIAR projects, have focused on producing high-quality fruit for high-end export or large city markets. This does not mean that projects addressing high-quality fruits are unnecessary, but the focus must also be on the processing industry to open opportunities for producers from areas of suboptimal

natural conditions, with a focus on larger-scale profitable production. Currently there are pockets of high-quality, very profitable production in certain locations, and vast areas of non-profitable orchards in danger of being cut down.

During the consultation process, a discrepancy between priorities of government officials, traders and farmers' became apparent, particularly as it related to the competing issues of meeting government priorities to address environmental and climate change issues versus considering farmers' economic interests. However, it was also evident that representatives of cooperatives seemed to be taking a more balanced approach. Over recent years, government policies have been increasingly oriented towards organic production (referred to as "production with organic orientation" in official government documents) to address environmental and climate change concerns, even though safe production following VietGAP protocols is still supported. Farmers currently perceive organic orientation as doing little for productivity or price, while adding extra production costs, because products grown with 'organic orientation' practices do not get a better price in the market. VietGAP certified products are better recognised in the market, but higher prices are only realised when produce is sold in supermarkets and speciality shops. Cooperatives are trying to supply cheaper organic inputs, mainly fertilizers, and find markets that would recognise commodities produced with an organic orientation. It is difficult to see how these "halfway to organic" products can be recognised in the market without a certification scheme, so organic inputs have to be competitive with non-organic inputs for farmers to adopt organic-oriented protocols. Government, extension services and organic input suppliers should also find ways to demonstrate the longer-term positive impacts on production of adopting practices that meet organic orientation.

The government has also been trying to improve fruit quality through the One Commune One Product (OCOP) program and certification scheme, which seems to have gained traction with producers and consumers. The underlying idea is that each commune concentrates on one product for which their situations are best suited, grow the fresh product following prescribed organic orientation practices, achieve VietGAP certification and, when appropriate, carry out local small-scale processing to deliver high-quality certified products.

The aspirations of the Son La government and some larger private sector stakeholders have been captured in the recently developed Theory of Change for Son La and Dien Bien provinces documented by the ASSET project:

"In 2030, Son La Province ... will be nationally recognized as a good model of agroecology and safe food systems transformation. All stakeholders, from producers to consumers in rural and urban areas, benefit from functional agroecological and quality-based value chains that improve local farming community livelihood. Agro-Ecotourism is well-developed and promotes local culture and locally produced safe products" (adapted from the ASSET-Flagship ToC process for Son La and Dien Bien provinces).

The outcomes of the ASSET project have been formulated as follows:

- The awareness of farmers, stakeholders, and state officials about Agroecology is increased
- Agroecology product value chains are established and operational, bringing benefits to different actors of the value chain
- The policy framework to manage and support agroecological development has been completed and implemented effectively
- Ecotourism is developed and promotes local culture and locally-produced safe agroecological products

The term agroecology in the ASSET project is equivalent to the Vietnamese government term "agricultural production with organic orientation", which has been used throughout this report.

The recently concluded ACIAR temperate fruit (AGB/2012/060 and AGB/2018/171) and vegetable (AGB/2014/035) projects have already contributed significantly to achieving the development vision stated in the Son La ToC by establishing a profitable, sustainable and safe horticultural industry in Moc Chau and to a lesser extent in Yen Chau and Van Ho districts. These producers have captured a large proportion of Hanoi's high-value markets, with produce now entering markets in other urban centres including Ho Chi Minh City. During our consultation process, the need for improving postharvest handling and processing was a dominant issue identified by all stakeholders, but this has not been fully addressed in the ASSET project.

It is recommended that future ACIAR projects focus on a) developing production protocols tailored towards processors' needs, so that incomes for farmers' producing processing quality fruit and vegetables would increase; b) improving post-harvest handling to be able to store fresh produce for a longer time, to prolong the sale period and avoid a drop in price during peak production times. Improved post-harvest handling would also enable longer transportation to reach distant export markets; c) development of quality control and traceability systems to support certification of origin and safe practices and branding; and d) introduction and commercialisation of new fruit varieties and development of value chains to market fruit of these varieties.

ToC consultations for Houaphanh Province, Lao PDR

The consultation and stakeholder workshop in Houaphanh province revealed a very different situation to that in Son La province. While the focus of the Son La government has been on the diversification of large-scale maize production into mainly horticultural and perennial tree cropping, the focus in Laos is still on food security. This centres on the development of maize and, to a lesser extent, cassava as export cash crops to Vietnam, together with increasing the number of cattle for export to China. Vegetable and fruit production is mainly for improving the nutrition of local people, even though small quantities of mangoes, longan and oranges are exported to Vietnam.

Export to Vietnam is organised by Vietnamese traders who also finance production in Laos and provide inputs. The major limitation for development identified by all stakeholders is the very poor road transport system. More than half of the villages are inaccessible during the rainy season, making the food self-sufficiency of these villages even more important. This major physical limitation is followed in importance by very limited human and social capacity in terms of knowledge, skills, access to finance and social organisation. The current social organisation has evolved to allow these communities to sustain themselves and survive these difficult natural conditions. Any transition towards market-oriented production has to be accompanied by building the capacity of the community as a whole, to be able to change gradually in an inclusive and equitable way. The central and provincial governments prioritised cooperative structures in their 9th five-year plan (2021-2025); however, most trade and export to Vietnam are currently organised and executed by Vietnamese traders who sign contracts with the Laotian government. Further research is needed to fully understand the role and extent of cooperative involvement in this trade, which will be done as part of SRA SLAM/2023/106.

At the ToC workshop held in Hanoi in November 2022, it was decided that to accommodate the priorities of the Laotian government and their plans, the focus of the project for which this Houaphan ToC was developed would be crop-cattle farming systems with emphasis not just on crop and fodder production, as in the previous project, but equally on animal husbandry and health. During the consultation process leading to the ToC workshop, local stakeholders had clearly expressed the need for the new project to provide support in animal husbandry. This was expressed through slight criticism of our current project when the leader of one farmer group said, "What is the point of teaching us how to produce animal feed if you did not teach us how to look after the animals?" To address this, the research team from the Vietnamese National Institute for Animal Science (NIAS) and the leader of the current ACIAR-funded beef project in the region (Stephen

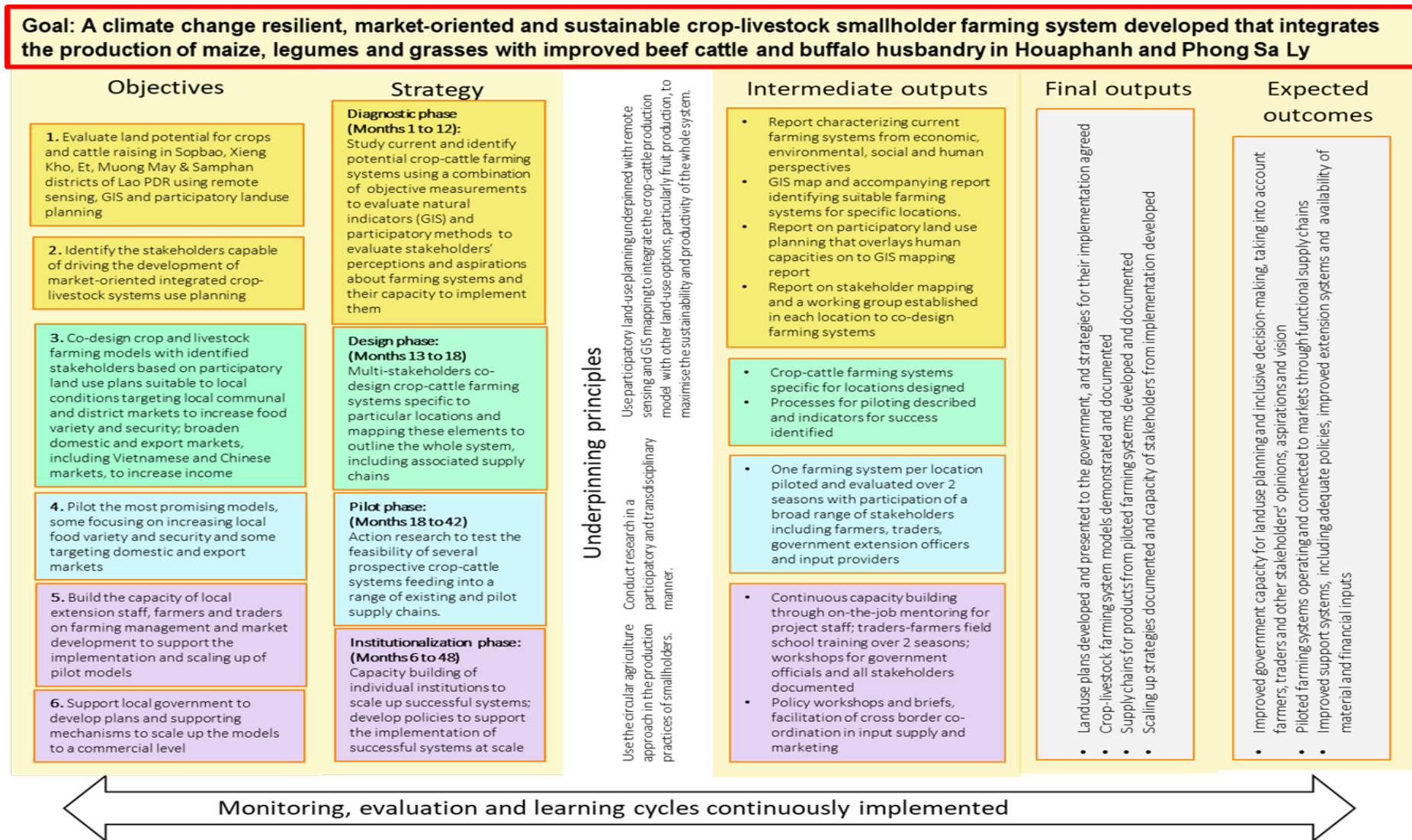
Ives, UTas), with whom we collaborated in SLAM 2014-049, were invited to the ToC workshop. This group fully participated in developing the ToC with the assumption that they are likely to be key participants in the new project. Unfortunately, we could not involve the Laotian counterparts in animal science, but as part of SLAM/2023/106, a range of new potential partners in Laos will be identified and engaged in revising and improving the developed ToC. To ensure coordination and collaboration with CIRAD's ASSET project, the CIRAD team participated in the ToC workshop, and they identified four areas of possible cooperation: soil health, legume mixed systems, forage and silage production and circular economy.

The issue of including fruit-based systems in the new project was discussed, but it was concluded that it was not one of the main Laos government priorities. The current overproduction of low quality fruit in Son La province, and a lack of other easily accessible markets, support this conclusion. In addition, research addressing fruit-based systems requires a completely different set of skills and the involvement of numerous additional research partners, which would make the project too large and difficult to manage.

A ToC for Houaphanh Province, Lao PDR

The ToC developed for the crop-livestock smallholder farming systems development project is presented in the graphic below (Figure 1).

Fig 1: ToC for the crop-livestock smallholders' farming systems development project



3 Background

Strong market demand for concentrated livestock feed to support the intensification of the poultry, pig and cattle industries resulted in a maize boom in NW Vietnam that has more recently extended into adjoining areas in NE Laos. While the rapid shift to annual cropping has had a large impact on reducing poverty in these regions, fluctuations in maize price, increasing soil erosion and declining soil fertility have pressured governments and communities into looking for less volatile and more sustainable land use options. These include perennial fruits, coffee and intensification of livestock production in a landscape that will also continue to support annual crops like maize.

Key challenges facing this increasing complexity of land use options relate to the availability of technical support, particularly for low-risk strategies for transitioning into and out of the different options while maintaining household incomes and protecting the soil resource. Land use change will be the result of socio-economic drivers, including changing market dynamics and policy frameworks, and will require a coordinated support framework from technical experts, extension agents, traders and input suppliers. This SRA used an established network of researchers, extension agents and traders involved in SLAM 2014-049 as the basis for developing a wider ToC focussed on the maize production areas in NE Laos. Initially, the intention was to develop ToC for a broader strategic program that would be the base from which several projects could be later developed in NW Vietnam and NE Laos, but both Vietnamese and Laotian teams strongly opposed this approach, partly because they had already developed broad ToC as part of CIRAD's ASSET project, and partly because they felt that local stakeholders would like to see "concrete ToC so they can clearly see what should be done and what they have to do". Consequently, the ToC, "A climate change resilient, market-oriented and sustainable crop-livestock smallholder farming system developed that integrates the production of maize, legumes and grasses with improved beef cattle and buffalo husbandry in Houaphanh and Phong Sa Ly", was developed, capturing opportunities for linking institutional research and private sector development capacity in Vietnam and Laos, especially in two adjacent provinces Son La (Vietnam) and Houaphanh (Laos).

4 Objectives

Aim:

The primary aim of this SRA was to develop a Theory of Change (ToC) for economically and environmentally sustainable and climate change resilient sloping land agricultural systems in northern Laos with stakeholders that represent the agricultures chains, research, extension and development in Laos and Vietnam and in particular Son La and Houaphanh provinces.

To achieve these goals, the SRA had the following three objectives:

1. Embedding knowledge in the research and local government institutions and along the supply chains.
2. Engaging with stakeholders on economically and environmentally sustainable and climate change resilient sloping land agricultural systems, to identify pathways and partners in future research.
3. Co-developing a ToC for economically and environmentally sustainable and climate change resilient sloping land agricultural systems in northern Laos and northwest Vietnam.

5 Methodology

Overall, the project team used participatory research approaches and facilitated the active engagement of non-professional researcher stakeholders, including staff from local government institutions, lead traders, farmers, and cooperative and community leaders, to ensure ownership, active dissemination, and wider socialisation of ToC and other SRA outcomes. The cooperative leaders and directors of companies involved in fruit and vegetable production and processing were engaged in sharing their experience in diversifying into more resource and knowledge-intensive crops.

The SRA team facilitated engagement and reinforced the relationships built between Vietnamese and Laotian researchers from ACIAR projects SMCN/2014/049 and LPS/2015/037, and CIRAD's ASSET project, who then collectively with local government, extension staff and private sector actors, co-developed the ToC.

In Son La, consultation meetings were held with DARD and extension officials, cooperative directors, traders, small and medium-scale processors and farmers in Yen Chau, Moc Chau and Van Ho districts and DARD and extension staff at the provincial level from the 2nd to 5th of June 2022. The ToC Workshop was held in Moc Chau on 8 June 2022, followed by visits to several traders and processors.

In Houaphanh, the ToC workshop was held from 9th to 11th August 2022 in Sam Nua with the government, traders and farmers from Sopbao, Xiang Khor and Et districts. At the beginning of November (7-11 November 2022), consultations were conducted with representatives from communes coming from the same three districts to discuss draft conclusions from the workshop.

Finally, at the ToC workshop in Hanoi from 28 to 30 November 2022, the Theory of Change for the project was developed to address development priorities in Houaphanh and Phong Sa Ly provinces. Besides the UQ team, representatives from CIRAD and the University of Tasmania were present from the international side, NOMAFSI, SFRI and NIAS from Vietnam and DALaM from Laos.

At provincial workshops, information, learnings and insights from ACIAR projects SMCN/2014/049 and LPS/2015/037 were combined with local stakeholders' experiences, needs and aspirations to co-develop ToC based on three pillars: production, market and leadership capacity (Fig 2).

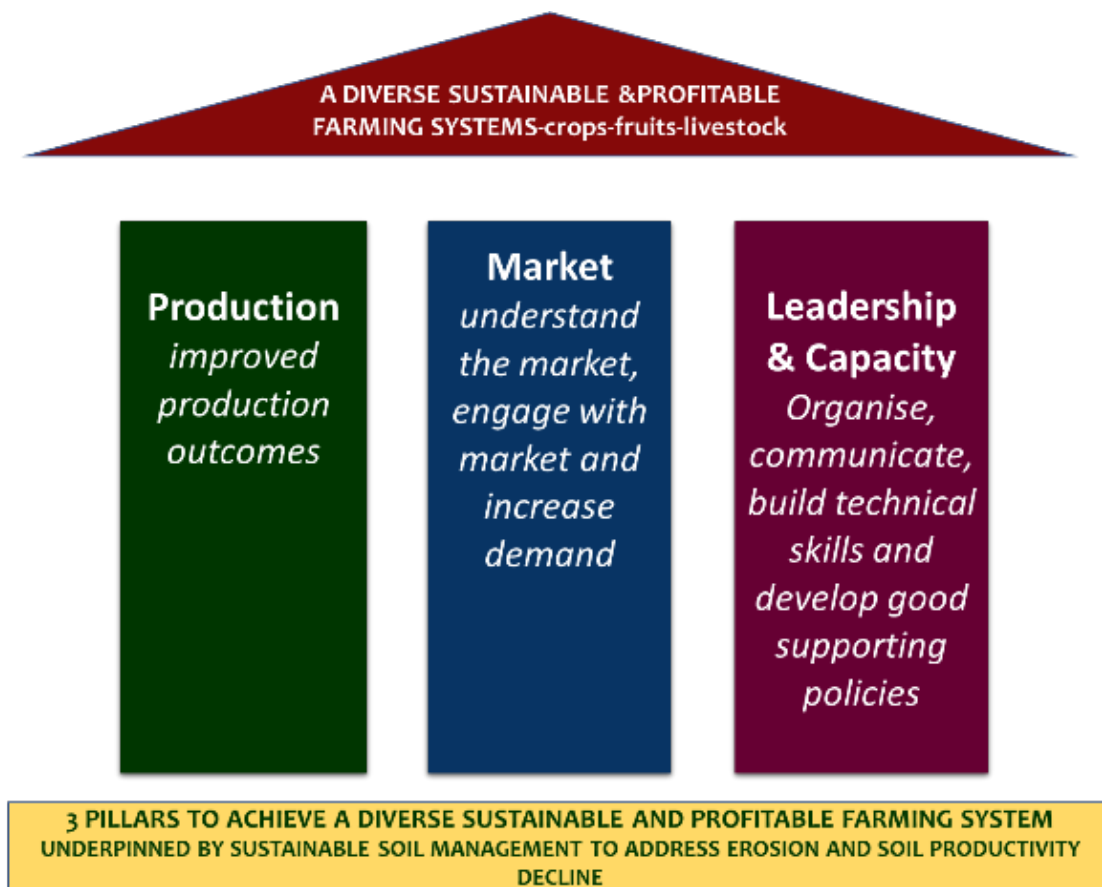


Fig. 2 The structural components addressed during the ToC workshops

6 Achievements against activities and outputs/milestones

Objective 1: (Knowledge and skills) Embedding knowledge in the research and local government institutions and along the supply chains.

	Activity	What should be done	What has been done
1.1	Analyse maize production dynamics in response to price fluctuations and policy changes, using current and historical satellite imagery with local ground-truthing. Identify and review key strategies used in initiatives to achieve diversification and increased sustainability of a maize-based system	Report on the result of analysis, with research opportunities and policy implications identified. Briefs for local government.	The interim report was written and presented as part of the SMCN/2014/049 final review workshop. It will be included in SMCN/2014/049 final report. Brief for local government is now part of SRA SLAM/2023/106 to allow additional farming system analysis.
1.2	Workshop to review approaches and impacts of training activities and extension material developed in SMCN/2014/049. This will lead to development of a curriculum and implementation schedule to train traders and farmers involved in maize supply chains originating in Houaphanh province, Laos PDR.	Report on review results. Curriculum developed.	Because of strict COVID-19 policies in Lao, cross-border training could not be conducted; teams could not travel to Houaphanh province. Many training activities were conducted in each country separately and were presented at the SMCN/2014/049 final review; will be reported in SMCN/2014/049 final report. The training curriculum will be developed in SLAM/2023/106
1.3	Continue SMCN/2014/049 field activities in Laos and experiments on <i>Centrosema</i> and orchard floor management in Chieng Hac as training and demonstration sites; continue N-fixation experiments in Son La to build local partners capacity to conduct and analyse legume N contributions in more complex scientific experiments.	Report on research results. Report on training activities utilising field teaching facilities.	Results were presented in SMCN/2014/049 final review and are part of SMCN/2014/049 final report. Small-scale N-fixation validation experiments will be conducted in SLAM/2023/106
1.4	Final Workshop in Moc Chau for Laotian and Vietnamese researchers, government officials and private sector actors, with focused sessions targeting scientific and development/policy outcomes.	Research and development issues and gaps identified to feed into ToC	Workshop conducted as part of SMCN/2014/049 final review. Workshop for Laotian policymakers in Vientiane is included in SLAM/2023/106

Objective 2: (Engagement) Engaging with stakeholders in developing economically and environmentally sustainable and climate change resilient sloping land agricultural systems to identify pathways and partners for the new project.

	Activity	What should be done	What has been done
2.1	Building on potential partners identified in the ACIAR NW Vietnam program, conduct engagement activities to communicate insights from previous and current ACIAR farming systems and value chain initiatives.	Compilation of key stakeholders Communication material developed. Workshops conducted	Consultation was conducted in Yen Chau, Moc Chau and Van Ho districts (Son La) and Sopbao, Xieng Khor and Et (Houaphanh), workshops in Moc Chau and Sam Nua. Reports are shown in Appendixes.
2.2	Identify outcomes desired by key stakeholders in the building and sustaining of diversified farming systems and supply chains	Preliminary outcomes for diversified farming systems and supply chains for inclusion in ToC development	Included in consultation and workshop reports presented in Appendixes.
2.3	Develop terms of engagement with key stakeholders, including government and non-government institutions, private sector stakeholders and farmers.	Summary of proposed partnership models/pathways for inclusion in ToC development	Included in consultation and workshop reports presented in Appendixes.

Objective 3: (Theory of Change Co-Design) Co-develop a theory of change for a new Project to accelerate the adoption of economically and environmentally sustainable and climate change resilient sloping land agricultural systems in northern Laos and northwest Vietnam.

	Activity	What should be done	What has been done
3.1	Consolidate key principles, objectives and pathways from objectives 1 and 2 to underpin the development of a Theory of Change (ToC)	Context for ToC developed in preparation for workshop 3.2	Achieved.
3.2	Conduct a ToC development workshop with the project team and key stakeholders. This will build capacity to develop and use a ToC, and formulates the desired pathways, outcomes and impact for an inclusive value chain initiative.	Workshop conducted. Synthesis of workshop outputs	Workshop conducted from 28 to 30 November in Hanoi
3.3	Write ToC for the project on economically, environmentally sustainable and climate change resilient sloping land agricultural systems in northern Laos and northwest Vietnam.	Initial ToC formulated	ToC written and presented in this report

7 Key results and discussion

7.1 Key results of the consultation and ToC workshop in Son La province and discussion

Detail reports on consultation, and ToC workshop in Son La province are presented in Appendix 1 and 2.

7.1.1 Identification of obstacles in production and marketing and suggested solutions by farmers and agricultural production cooperatives

Crop production

From the perspective of farmers and cooperatives, crop production on sloping land is challenged by soil erosion and landslides; weeds and degraded soil; difficult transportation; and very limited opportunities to intensify and mechanise production. Some technical measures were suggested to address these problems, including developing modern fruit plantations with drip irrigation in flat areas. There are also concerns about the fruit varieties that are being grown, many of which are of poor quality and unknown origin. There are difficulties accessing new varieties, so they are limited to cultivating a few varieties that all ripen simultaneously, resulting in a short harvest season. To address this problem, it is necessary to improve the nursery industry, not just the production itself, but also IP regulation and management to be able to gain access to modern varieties with IP attached. The vegetable seeds problems can be solved easier by selecting reputable suppliers or looking for good varieties online.

Fertiliser quality is their other concern. They mentioned the chaos in fertilizer markets, low quality and 'fake' fertilisers. They see the solution to the problem as finding reliable information and reputable fertilizer suppliers and shops.

Other difficulties include limited use of modern technologies, unstable markets and bad weather. They suggested some actions to overcome these obstacles, including learning how to grow fruit and vegetable off-season, changing farming practices, selecting good varieties and introducing new technologies in production and postharvest (but it requires a large investment). Regarding the cooperation between Vietnam and Laos in crop production, farmers stated they could share experience in producing maize, rice, fruit, buffalo and beef. Local farmers and authorities said that they are willing to have relations with Laotian farmers and cooperatives.

Market

The farmers and cooperatives emphasized that the market for selling their products is their big concern. At present, most fruits do not meet the quality requirements of the domestic institutional and export markets. The reasons are farmers' limited knowledge, low production investment and limited technology application. In addition, some areas and households face difficulties in production due to bad weather and markets. They expected to learn and apply new science and technology initiatives in production and have long-term contracts to sell their products and apply modern technology in their production for better quality products such as organic orientation products or VietGAP products. Furthermore, they find it difficult to access loans from the banks (loan amount is relatively low); they expect relevant credit policies to finance input materials, production, and marketing to soon be implemented.

The market for agricultural products is unstable; the price of varieties and materials has increased; farmers made large investments due to high costs but achieved low income and profit and are faced high competition with other localities. The complicated contract

procedure to sell products to the processing companies, compounded with the cooperative directors' low management skills, prevent the full benefits of the recently developed processing infrastructure in Son La from being realised. Finally, poor postharvest storage capacity, especially a lack of cooling facilities, compounds the problem of a high influx of products at certain times, significantly reducing prices and causing product losses.

To overcome these difficulties, farmers and cooperatives suggested that crop production should focus on high-quality products following safe production protocols linking production with market requirements. The focus should be on locality-specific products for which there are good natural conditions (OCOP concept). The cooperatives' capacities should be improved, including management skills, infrastructure (cool storage and packaging) and finances. Cooperatives should develop long-term formal relationships with processing factories, institutional markets and exporters. The cooperatives should also develop reputable brands.

7.1.2 Identification of obstacles in production and marketing and suggested solutions by traders

Crop production

The traders identified nine main obstacles as follows: 1) Difficult farming locations resulting in expensive transportation with high product losses; 2) Farmers' low investment in production, including labour, materials, fertilizers, plant protection and high quality seedlings, compounded by fake and low-quality input products; 3) Farmers' limited use of technology and abuse of chemicals; 4) Farmers' production is not based on market predictions, but it follows current trends and availability of inputs; 5) Quality of farm production depends on seasons and weather, with weather events becoming more unpredictable and extreme; 6) Farmers' limited understanding of organic farming techniques and processes, including a lack of care for the soil, no understanding of soil born diseases and abuse of pesticides; 8) Limited availability and understanding of market information (not focusing on learning and not understanding the product requirements of each market); 9) Weak linkages between farmers and traders.

To solve these difficulties, solutions suggested by traders included: 1) Conducting systematic research on the suitability of each plant and animal species and variety/breed to natural conditions in specific communes and districts, especially considering soil and climate conditions. The extension services should be enabled to use the results of this research and work with farmers in their implementation; 2) Research to improve soil fertility, use of fertilizers and pesticides, and develop new technologies; 3) Household-level training courses on the management of production and access to and allocation of financial resources, to sustain production independently from input providers; 4) Develop policies to attract labour through economic efficiencies in agricultural production; 5) Train farmers to find and utilise relevant market information. Develop communication platforms to provide market information to farmers, cooperatives and other stakeholders; 6) Training on organic/organic-oriented agriculture for all parts of the production system i.e. farmers, extension officers, traders, and authorities; 8) Having policies, regulations and mechanisms to control individuals/companies who produce, import and trade seed, seedlings and other planting materials, fertilisers and pesticides/herbicides.

Market

Traders listed the following barriers to improving the marketing of agricultural products: 1) Market fluctuation and lack of updated market information, including data on specific product requirements for different markets; 2) Difficulties in accessing market information outside the locality, with information about outside markets often provided by investors from these outside markets; 3) Difficult to develop a long-term relationship with cooperatives to develop and deliver production and marketing plans; 4) The products do not meet the markets' requirements, resulting in the low selling price; 5) Trading with Laos is still limited

because of difficulties in transportation and product collection due to Laos' local policies; Supply of inputs in Laos is also difficult. 6) Postharvest storage, transportation and preliminary processing are not good enough for transportation to long-distance markets or export. In 2021 only 1 % of mango fruit could be exported to premium markets (US, EU, Australia and premium Chinese markets); 7) Farmers have weak linkages with traders.

The traders expected the government to provide regular information about the market through local radio stations, cooperatives, producer groups and farmer associations, and to invest in and support the development of postharvest facilities, processing factories and transportation infrastructure. They also expect the government to encourage the development of specialised production in certain areas and to establish mechanisms to enforce contracts.

They also want the government to build the capacity of cooperatives, especially management, infrastructure and operating capital. Traders' perceptions are that, at present, cooperatives do not operate according to the Cooperative Law, do not have a well-defined and viable business models, do not have adequate finance and accounting systems and personnel, and many of them do not have certified planting areas hence cannot provide the Production Unit Code (PUC). The traders also stated that cooperatives must improve their capacity to guide their members to produce according to the specific requirements of different markets. However, developing products to suit different markets is not just a cooperative problem, but applies to all stakeholders involved in agricultural production and trade, so it needs to be a priority for R&D investments by the government and the private sector.

To improve trading with Laos, traders proposed free trade agreements between Laos and Son La. This agreement would remove the monopoly the Laotian local government gives to particular traders to purchase products in a certain village. From the Laotian government's point of view, contracts which give traders a de facto monopoly are there to protect farmers by guaranteeing the minimum price traders have to pay. In reality, on most occasions the minimum price is well below the market price, so allowing competition between traders would, in most cases, benefit farmers.

7.1.3 Identification of obstacles in production and marketing and suggested solutions by local authorities, government agencies and extension centres

Crop production

The local authorities, extension and agricultural agencies identified the following obstacles: 1) Low awareness by local farmers of sustainable farming practices; 2) Limited scope to use modern technologies, including mechanisation and production protocols on sloping lands; 3) Difficulty in using labour-intensive soil preservation and erosion management cultivation options; 4) Increase in weather unpredictability and in the number of severe weather events that affected crop production; 5) Increases in prices of input materials and a lack of labour.

The local authorities and agencies aspire to strengthen management and supervision of the implementation of technical protocols aligned with organic production orientation and sustainable farming on sloping lands. They suggested training activities to raise farmers' awareness of sustainable practices, including site visits to learn about the successful models.

Policies should be developed to encourage and support farmers to adopt sustainable practices, including the provisions of farming inputs and access to technologies, but in return, farmers should work hard and learn by doing themselves. Participants suggested several pilot models, including the use of agricultural by-products for mulching to prevent erosion and increase production; crop rotation and intercropping; agroforestry and keeping the forest in areas with very steep slopes (>25%); planting following contour

lines and using minimum tillage with residue retention; planting trees according to “crocodile fangs” to limit erosion; planting legumes; transformation of crop structure with limiting the use of chemical fertilizers and increase the use of organic fertilizers.

Market

In terms of the market, the local agencies pointed out the weak connection between local production and markets, including trade promotion, product packaging and branding; poor logistics, including transportation and storage facilities; poor product quality; and unstable selling prices and the competition with imported products.

The local agencies have been building brands for local products to increase market access and plan to continue to do that. They identified the need for training human resources to access market information and conducting advertising and trade promotion campaigns; linking all actors in the production and market chains; enhancing technical training to meet product quality requirements of the target market; and investing in cold storage.

Regarding technical measures, they suggested focusing on crop diversification and off-season planting to prolong the marketing period and avoid oversupply resulting in low prices. Improve the quality of products and their postharvest handling to expand and diversify markets. Finally, infrastructure and human capacity should be developed for preliminary processing.

7.1.4 Conclusions and recommendations of the consultation with Yen Chau, Moc Chau, and Van Ho district stakeholders

Conclusions

Even though maize remains a major crop in all districts, the focus of attention has shifted to fruits, mainly mango, longan and plum, and to a lesser extent avocado and peach. Moc Chau and Van Ho have also strongly focused on safe vegetable production. In all three districts, cattle and buffalo production development was acknowledged as having great potential, but participants did not elaborate further.

The local government wants to focus on the production of specific local products recognised by consumers, including local mangoes and plums in Yen Chau; vegetables, high-quality plums, peaches, avocados and strawberries for local tourist markets and high-value domestic and export markets in Moc Chau; vegetables and citrus in Van Ho. There are four groups of activities that have been receiving the attention and investment of the authorities and other stakeholders: 1) Agricultural production with organic orientation, applying high technology with priority given to VietGAP, GlobalGAP and OCOP products; 2) Improving markets for existing local agricultural products and expanding into new markets, including local markets boosted by agritourism, high-value domestic markets in Hanoi and other urban centres in the North and South and high-value export markets. To achieve this goal, the focus is on increasing product quality and obtaining certifications to convince consumers that products are safe and sustainably produced; 3) Improving postharvest and storage facilities and developing the processing industry; and 4) Development of livestock production.

The main issues in these localities include: 1) Diversification from maize to fruit production resulted in an oversupply of mango, longan, plum and Hmong apple in the traditional domestic markets; 2) Moc Chau and Van Ho developed large-scale vegetable production, especially in the rainy season, but have now reached overproduction and need to improve postharvest and cool chains to extend markets in Hanoi and other urban centres; 3) A strong push towards organic orientation, safe production certification, branding and geographic indication including OCOP, but in most cases farmers are not getting additional benefits; and 4) There are a large number of newly formed cooperatives, but the majority are without management skills and access to finance for investment.

Recommendations for improvements:

- The localities need to specialise in production to meet the quality standards of different target markets. Any further development of the horticultural industries has to focus on improving product quality, postharvest handling and processing, and not expanding production areas.
- Technical guidance should support simple, sustainable, organically oriented practices that require reasonable investment. Implementation should be strictly monitored, and adequate guidelines and support should be provided. The evaluation of outcomes should be staged so practices can be modified and adapted to local situations.
- The farmers' capacity to practice sustainable farming and engage in marketing should be improved through regular training, coaching and communication.

7.1.5 Summary for Son La province

In Son La, large-scale development of mango (18,918 ha), longan (18,702 ha), plums (11,507 ha) and H'mong apples (12,126 ha) based on a few or often single varieties has resulted in overproduction and significant reductions in price and farmers' income. However, the price of high-quality fruit, especially when produced following protocols that guarantee food safety (VietGAP, GlobalGAP and organic) that meets the requirements of high-value domestic markets and export, remains highly profitable. The local government succeeded in attracting large processing companies to build factories in Son La, so in the last few years, 4 large factories have been built, which will provide a market for low-quality fruit that makes up the majority of fruit produced in Son La. There is also a flourishing of medium and small-scale enterprises and cooperatives. During the consultation process, it became clear that there are conflicting views and interests between farmers and processors. Processors were attracted to invest in Son La because of the abundance of low-priced fruit, while farmers' expectations were that prices would significantly rise because of the increase in demand for fruit for processing. There is a great need for facilitation between farmers and processors, and traders who are acting as intermediaries to agree on prices that allow profitable fruit production and processing. From our observations during the consultation process, there are unrealistic expectations from farmers about the price that processors can pay, but there are also predatory behaviours, especially from intermediary traders, to take advantage of the abundant fruit supply. Farmers need to improve their productivity by optimising inputs and labour investment and implementing production protocols specific for processing fruit quality. What is currently happening is that farmers are dumping fruit that does not reach the fresh fruit market requirements to processors. There is a real need for research projects to address knowledge gaps and the lack of skills in the production of processing-quality fruit. Nearly all projects, including our ACIAR projects, have focused on producing high-quality fruits for high-end markets in large cities and export. This does not mean that projects addressing high-quality fruits are unnecessary, but the focus must also be on the processing industry to open opportunities for producers from areas of suboptimal natural conditions and achieve larger-scale profitable production. Today, unfortunately, we have pockets of high-quality, very profitable production in certain locations and vast areas of non-profitable orchards in danger of being cut down.

During the consultation process, a discrepancy between government officials, traders and farmers' priorities became apparent, while representatives of cooperatives had a more balanced approach in trying to satisfy government priorities to address environmental and climate change issues and farmers' economic interests. Over recent years government policies have been increasingly oriented towards organic production (referred to as "production with organic orientation" in official government documents) to address environmental and climate change concerns, even though safe production following

VietGAP protocols is still supported. Farmers perceive organic orientation mainly as adding costs (not so much reducing production) without increasing income because products grown following organic orientation do not get a better price in the market. VietGAP certified products are better recognised in the market, but higher prices are only realised when sold in supermarkets and speciality shops. Cooperatives are trying to supply cheaper organic inputs, mainly fertilizers, and find markets that would recognise organic products produced with an organic orientation. It is difficult to see how these “halfway to organic” products can be recognised in the market without a certification scheme, so organic inputs have to be competitive with non-organic inputs for farmers to adopt organic-oriented protocols. Government, extension services and organic input suppliers should also find ways to demonstrate longer-term positive impacts of following organic orientation on production.

At the same time, the government has been trying to improve fruit quality through the One Commune One Product (OCOP) program and certification scheme, which seems to have gained traction with producers and consumers. The underlying idea is that each commune concentrates on one product for which they have the best conditions to develop, grow the fresh product following organic orientation, VietGAP certification and, when appropriate, do local small-scale processing resulting in high-quality certified products.

The recently developed Theory of Change for Son La province developed by the ASSET project captured the aspirations of the Son La government and some larger private sector stakeholders well:

“In 2030, Son La Province ... will be nationally recognized as a good model of agroecology and safe food systems transformation. All stakeholders, from producers to consumers in rural and urban areas, benefit from functional agroecological and quality-based value chains that improve local farming community livelihood. Agro-Ecotourism is well-developed and promotes local culture and locally produced safe products” (adapted from the ASSET-Flagship ToC process for Son La and Dien Bien provinces).

The outcomes of the ASSET project are formulated as follows:

- The awareness of farmers, stakeholders, and state officials about agroecology is increased;
- Agroecology product value chains are established and operational, bringing benefits to different actors of the value chain;
- The policy framework to manage and support agroecology development has been completed and implemented effectively;
- Ecotourism is developed and promotes local culture and locally-produced safe AE products.

The term agroecology in the ASSET project is equivalent to the Vietnamese government term “agricultural production with organic orientation”, which has been used throughout this report.

The recently concluded ACIAR temperate fruit (AGB/2012/060 and AGB/2018/171) and vegetable (AGB/2014/035) projects have already significantly contributed to achieving the development vision stated in the ToC by establishing a profitable, sustainable and safe horticultural industry in Moc Chau and to a lesser extent in Yen Chau and Van Ho districts, that has captured a large proportion of Hanoi’s high-value markets and is extending to other urban centres including Ho Chi Minh City. During our consultation, the need for improving postharvest handling and processing was a dominant issue identified by all stakeholders, but it has not been fully addressed in the ASSET project.

7.2 Key results of the consultation and ToC workshop Houaphanh province and discussion

A detailed report on the consultation and ToC workshop in Houaphanh province is presented in Appendix 3. The consultation in Houaphanh province centred around implementing the 9th 5-year plan and priorities for the three focus districts to achieve those planned objectives. Finally, barriers to achieving development objectives and how to overcome these barriers were identified.

7.2.1 Development programs and supporting activities outlined in the 9th 5-year plan 2021 to 2025

The Food Security Program:

It is to determine the structure of agricultural production in terms of cultivation and animal husbandry, such as rice, food crops, commodity crops, livestock, and fish. In this plan, the most important priorities are: 1) Rice production: the total rice planting area is 28,566 ha; 2) food crops: producing food crops in an area of 7,276 ha; and 3) animal husbandry and fishing are mainly focused on raising cattle (by 2025, there will be 148,056 cows), buffaloes (by 2025, there will be 56,648 buffaloes), and pigs (by 2025, there will be 168,466 pigs).

Agriculture and Forestry Production Program:

Speeding up the organization of production as a cooperative. There is a policy to promote production and processing with the goal of increasing the value and quality of products; increasing access to credit; marketing; and transportation; as well as supporting measures to reduce the effects of disasters. At the same time, there are plans and measures to manage agricultural land development, research and experiments in agriculture, forestry, and rural development, as well as regular coordination with related departments, including: a) Planting as a commodity: This includes all 7 main crops and estimates that production by 2025 will be 22,556 ha throughout Houaphan province, which includes priority crops such as: 1) coffee, aiming to produce 567 ha of planting area by focusing on 4 districts, namely: Sam Tai, Kwan, Son, and Sam Nua districts; 2) maize for animals until 2025 to get 9,291 ha of planted area; and 3) cassava until 2025 to get 2,091 ha of planted area. There are also other plants such as jojoba, tea, and cardamom. b) Animal husbandry and fisheries: until 2025, the goal is to produce a variety of animals for domestic consumption and export, including 22,899 cows, 5,282 buffaloes, and 16,101 goats. c) Forestry and NTF products: 1,100 tons of NTF from various permitted species, as well as some bamboo

The managing and protection of forest program:

PAFO is to continue managing and allocating forests and forest resources according to green and sustainable development by focusing on the management of national forest reserves, forest protection management, forest inspection, and forest resources.

Rural Development and Poverty Alleviation Program:

Continue to develop rural infrastructure and allocate land and jobs to people who do not have stable land and jobs. Improve living standards and get rid of poverty gradually. The province aims to achieve the target of 26 per cent of poor villages in 2025 within 10 districts, with the aim to declare four districts: Son, Sop Bao, Xiengkho, and Vieng Xay poverty-free districts. Development efforts also focus on developing rural infrastructure (public infrastructure, access roads to production areas) and organizing farmer groups and cooperatives.

Supporting works

Management and development of agricultural land and fertilizers: This is to speed up the delineation of specific production areas for planting rice, other broadacre crops, vegetable and fruit trees, and livestock and fish and determine the potential production areas of each locality. Carrying out participatory surveys and plans for the use of agricultural and forestry land at the village level, issuing agricultural land use certificates and agricultural land development certificates, demonstrating and recommending straw ploughing to increase rice yield to 100 hectares (10 ha/district), and collecting 600 tons of manure, compost, and plant debris to nourish the soil in the dry and rainy seasons

Irrigation-agricultural development is increasing the capacity to supply irrigation water to agricultural production areas, and irrigation projects in the annual development plan from 2021 to 2025 have a total of 21 projects that will accelerate the rice cultivation focus areas of the province in 3 districts along the Namma River, namely: Sop Bao, Xiengkho, and Et, and focus on small chicken production and rice cultivation in 2 districts, namely: Viengxay and Sam Nua.

Researching and expanding plant, animal, fish, and fruit tree varieties; Speeding up the improvement and maintenance of plant and animal varieties, as well as training farmers in planting and rearing techniques; and strengthening the province's personnel by providing technical training, organizing study tours, and sharing lessons with other parties.

Transferring planting, rearing, and processing technology techniques; determining appropriate, advanced, and modern techniques to disseminate and encourage units, families, farms, and farmer organizations to use them in producing and processing crops, goods, animals, and fish.

Improving the production model It is accelerating the promotion of production as a product at the family level, moving up to a cooperative, farm, or network of specialized associations in relation to the services of two ends of domestic and foreign businesses with the development and upgrading of the technical infrastructure (mechanics, mills, bakeries, grain mills, drying racks, wholesale-retail markets, cold storage, fertilizer factories, feed mills, and slaughterhouses), and promoting and organizing agricultural business units (how to organize, business plan, accounting, access to credit, factors of production, and market).

Plant protection and quarantine work: updating and publishing various pieces of legislation, guidelines, and technical manuals to serve as a foundation for managing plant quarantine and import-export management.

Organic Agriculture: Accelerate the certification of clean agriculture production areas for producer groups and control the use of chemicals and pesticides.

Create the ability to reduce the risk of natural disasters by creating a management plan and reducing the risk of disasters in the agricultural sector at the district and village levels by having reserves of seeds, production factors, fertilizers, medicines, and others in case of droughts and floods, disease-insect outbreaks;

Policy and Legislation Create and update legislation below the law, including policies and strategies for the necessary and priority sectors in order to link with the international and regional markets, as well as a focus on spreading and monitoring the implementation of agricultural and forestry development strategies.

Inspection work is mostly related to political work, encouraging and monitoring the thinking of civil servants and volunteers.

The work of improving organizations and developing human resources is focused on improving efficiency, upgrading the knowledge and skills of employees, and creating local skills.

Cooperation work focuses on implementing the management mechanism for international cooperation and using aid for development, management, and inspection, targeted and highly effective assistance. It is also to determine the areas and allocate production areas related to solving the problem of land reservation that leads to the promotion of production in a wide range of economic cooperation between provinces and provinces, districts and districts according to the potential of each production area, and allocate production areas to the animals, especially the forest areas of each village.

Integration of production and marketing data accelerates the creation of a database of statistics on agricultural production, forestry and rural development, services, and dissemination of information, facilitating investment in agriculture, transportation of goods, and exports.

Table 1: The Agriculture, Forestry, and Rural Development Five-Years Plan IX (2021–2025) of PAFO

<u>Pillar 1: Agriculture</u>
1. The Food Security Guarantee Program
1.1 An action plan to ensure food security
A. Rice production: Total rice planting area: 28,566 ha, with an estimated yield 109,789 tons <ul style="list-style-type: none"> ▪ Dry season rice: area 1,876 ha, estimated yield 7,614 tons. ▪ Rainy season rice: area: 15,299 ha, estimated yield: 72,328 tons. ▪ Upland rice: reduce the farmland to 11,390 ha in 2025, with an estimated yield: 29,846 tons.
B. Crops production: total area of 7,276 ha; estimated yield 37,750 tons.
C. Animal husbandry and fisheries <ul style="list-style-type: none"> ▪ Cattle: By 2025 = 148,056 cattle. ▪ Buffalo: By 2025 = 56,648 buffalo. ▪ Pigs: By 2025 = 168,466 pigs.
2. Agriculture and Forestry Production as a commodity Program
2.1 Crop production (China, Vietnam, Thai, Europe)
A. Coffee: area = 567ha, Yield =2,536 tons B. Maize: area= 9,291 ha, Yield =51,782 tons C. Casava: area=2,091 ha; 16,129 tons D. Job's tear: area =1,054ha; Yield=2,128tons
2.2 Livestock production (Promotion of livestock, fish and aquatic animals)
A. Cattle = 22,899
B. Buffalo = 5,282
C. Goat = 16,101

D. pig = 65,597
<u>Pillar 2: Forestry</u>
1. Forest management and protection programs
A. management of forest reserves
B. Protection, forest management work B. Protection, forest management
H. Survey and assess the status of forest resources.
<u>Pillar 3: Develop the countryside and eliminate poverty</u>
1. Rural Development and Poverty Alleviation Program
1.1 Development of rural infrastructure (public infrastructure, roads to manufacturing area)
1.4 Cooperative and group organization
<u>Supporting works</u>
1. Agricultural land and fertilizer management and development
2. Agriculture and irrigation development
<ul style="list-style-type: none"> ▪ The focus areas for rice cultivation in the province are defined as 3 districts (SB, XK and Et district) ▪ Focus areas for Kai noy rice
3. Plant, animal, fish, wood, and fruit tree research and expansion
<ul style="list-style-type: none"> ▪ Improve animal, plant, and fruit tree care. ▪ Produce baby fish ▪ Produce seedlings for fruit and tropical industrial timber. ▪ 3-5 trainings on planting and animal husbandry techniques for farmers
4. Transfer of planting, breeding, and processing techniques and technology
5. Improving the manufacturing model
<ul style="list-style-type: none"> ▪ Development and upgrading of technical infrastructure (mechanics, mills, bakeries, grain mills, drying racks, wholesale-retail markets, cold storage, bio-product factories, animal feed factories, slaughterhouses...) ▪ Promotion of agricultural businesses (organization method, business plan, accounting, access to credit, production and market factors...)
6. Plant protection and quarantine duties
7. Environmentally friendly agricultural work
8. Capacity building to reduce natural disaster risk

9. Policy and legislation work
<ul style="list-style-type: none"> ▪ 10. Inspection work
11. Work to improve the organization and develop human resources <ul style="list-style-type: none"> ▪ Direct improvement ▪ Improving the knowledge and skills of employees in the sector
<ul style="list-style-type: none"> ▪ 12. Cooperation with foreign countries
13. Integration of information on production and marketing <ul style="list-style-type: none"> ▪ Creating a database of agricultural, forestry, and rural development statistics ▪ Services include the dissemination of information on agriculture, forestry, and rural development. ▪ Favouring investment in the agricultural sector, transportation of agricultural products for export

7.2.2 Main development objectives for Xiengkho and Et districts

The development objectives for the Sop Bao district were not reported.

Xiengkho district

1. Continue to implement the 9th 5-year development plan for agriculture and forestry until 2025, develop the strategic plan for agriculture and forestry until 2025, and develop the vision until 2030. Accelerate the creation of annual action plans to determine the detailed development focus.
2. Pay attention to creating and organizing production groups such as animal husbandry, cultivation, production cooperative, and service units or service providers to transform into an organic market.
3. Improve the efficiency of promotion work for farmers in the development of planting and rearing, with a focus on creating a diverse range of model families.
4. Monitor and re-evaluate the outcomes of previous policy implementations in order to share lessons learned with the model of improving the plan into a system appropriate for each locality's actual environment.
5. Accelerate the survey of the area; collect various information to determine the detailed division of production areas such as agricultural production areas, conservation areas, each type of animal husbandry area, agricultural crop areas, and industrial crop areas suitable for special points and the natural conditions of each area.
6. Accelerate the cultivation of crops and rice (N 87, N 97) because Xieng Khor district has a limited production area, aiming to raise the quality of production to participate competitively in the international market and the needs of the markets of surrounding countries.
7. Accelerate measures to deal with violators of the Law on Forests, Water Animals, and Wild Animals and Order No. 15/MT strictly according to the offender's case, such as education, disciplinary measures, fines, criminal measures, and measures to increase punishment according to each article of the law.

Et district

1. Increase in protection and repair of existing infrastructure among government sectors, business entities, village-level authorities, as well as ethnic groups. Within the Et district, they must be responsible for the creation and development of offices, business units, and villages. They must be strong in terms of organization and technology. At the same time, offices, shops, community-public areas, and villages must be orderly and clean.
2. The offices within the district and the village administration must pay attention to the integration, strengthening, and transformation of the fifth 5-year socio-economic development plan. The resolution of the general meeting of the party committee and the policy guidelines of the party are issued as a detailed plan and project, as well as increasing the responsibility and ownership in the implementation to make it a reality.
3. Focusing on mobilizing and raising funds from the public sector; seeking assistance from the friendship districts (Song Ma and Sob Kok District) in Vietnam and various international organizations to develop the economy and society of the Et District; and creating the necessary infrastructure, special policies, and a good environment to favor and attract domestic and foreign private sector investment more than before.
4. Improvement of the coordination mechanism and division of management between the province and the district according to the three directions: be absent, be clear and convenient, and explore and create new revenue bases more than before. Raising awareness of the role of politics, the role model of employees (civil servants), fighting against crime and various scandals that occur in the financial sector, implementing measures against violators, disciplinary measures against offenders, and strict financial regulations
5. The banking service units within the district must be responsible for providing credit to meet the goals of the city's socio-economic development plan in each period. This is to accelerate the cultivation and raising of people and the investment projects of the business units according to the potential of the district.
6. To be efficient and highly effective, the government sectors must be responsible for implementing their roles and for the management of state investment projects in accordance with the law. To ensure three interests—the general interests of the people, the interests of the government, and the interests of business entities—at the same time, the village administration must increase its responsibility to a higher level, and the people of the ethnic groups within the district must increase their self-reliance and build their own strength in building and developing their families.
7. Continue to implement the Sustainable Development Goals (SDGs) goals that have not yet been achieved as expected to be completely completed, especially some goals related to poverty reduction in the development of education and public health.

7.2.3 Summary of the consultations with traders, farmers and government officials

Main problems identified by traders

- 1) Roads are inadequate between the towns along the Vietnamese border, and there are few crossings with well-developed infrastructure. However, the major challenge is reaching villages at any time, but reaching around 50% of villages during the rainy season is impossible. Besides roads, organising transportation is difficult and expensive.

- 2) The cost of inputs for maize production significantly increased, resulting in fewer farmers growing maize and a reduction in yields for farmers still producing. This represents a major problem for traders because the low trade volume from remote locations makes the whole venture less profitable. Organising maize production in Laos is becoming riskier for Vietnamese traders because investment increases due to higher input costs, and at the same time, access to finance, even for traders, is more difficult and expensive.
- 3) Farmers often harvest maize too early with high moisture, resulting in high losses in post-harvest handling and transportation until maize reaches drying facilities in Vietnam. Traders do not think building drying facilities in Laos using their own capital is viable for them.
- 4) Laotian government-sponsored contracts that define fixed prices for maize often caused conflict between traders and farmers. Both sides often ignore these contracts, and the prevailing market price is used instead, and sometimes farmers break the contract altogether and sell to another opportunistic trader without the contract.

Requests from traders

- 1) Main roads to be repaired by the government. Traders are willing to build and repair access roads to fields but with the contribution of other stakeholders, including farmers.
- 2) Preferential access to loans and other incentives like reduced land prices in order to build drying facilities for maize in Houaphanh province and to be able to export maize grain, not cobs.
- 3) Major overhaul of export regulations and contracting system to make it simpler, transparent and enforceable.

Main problems identified by village authorities and farmer representatives

Village authorities and farmers views largely agree with the traders view on the major problems: poor roads, inadequate contract arrangements and difficult access to finance for very expensive inputs. However, traders focused exclusively on maize production, while farmers requested support to diversify into fruit production, orange, mango and longan, and livestock production, beef cattle and pigs.

Farmers requested support and training in fruit growing techniques, including establishing orchards and training young trees, pruning and plant protection. For livestock production, farmers requested improved government vaccination programs, breeding programs to increase herds and training in animal husbandry.

7.2.4 Summary for Houaphan province

The consultation and stakeholder workshop in Houaphan province revealed a very different situation to that in Son La province. While the focus of the Son La government has been the diversification of large-scale maize production to mainly horticultural crops, the focus in Laos is still on food security. This centres on the development of maize and, to a lesser extent, cassava as export cash crops to Vietnam, together with increasing the number of cattle for export to China. Vegetable and fruit production is mainly for improving the nutrition of local people, even though small quantities of mangoes, longan and oranges are exported to Vietnam. Export to Vietnam is organised by Vietnamese traders who also finance production in Laos and provide inputs. The major limitation for development identified by all stakeholders is the very poor road transport system. More

than half of the villages are inaccessible during the rainy season, making the food self-sufficiency of these villages even more important. This major physical limitation is followed in importance by very limited human and social capacity in terms of knowledge, skills, access to finance and social organisation. The current social organisation has evolved to allow these communities to sustain themselves and survive these difficult natural conditions. Any transition towards market-oriented production has to be accompanied by building the capacity of the community as a whole to be able to change gradually in an inclusive and equitable way. The central and provincial governments prioritised cooperative structure in their 9th five-year plan (2021-2025); however, most trade and export to Vietnam are currently organised and executed by Vietnamese traders who sign contracts with the Laotian government. Further research is needed to fully understand the role and extent of cooperative involvement in this trade, which will be done as part of SRA SLAM/2023/106.

At the ToC workshop held in Hanoi in November 2022, it was decided that to accommodate the priorities of the Laotian government and their plans, the focus of the project for which this ToC was developed would be crop-cattle farming systems with emphasis not just on crop and fodder production, as in the previous project, but equally on animal husbandry and health. During the consultation process leading to the ToC workshop, local stakeholders clearly expressed the need for the new project to provide support in animal husbandry through slight criticism of our current project when the leader of one farmer group said, “What is the point of teaching us how to produce animal feed if you did not teach us how to look after the animals?” To address this, the research team from the Vietnamese National Institute for Animal Science (NIAS) and Stephen Ives (UTas), with whom we collaborated in the previous project, were invited to the ToC workshop and fully participated in developing the ToC with the assumption that they will be part of the new project. Unfortunately, we could not involve the Laotian counterpart in animal science, but as part of SLAM/2023/106, a range of new potential partners in Laos will be consulted and engaged in revising and improving the developed ToC. To ensure coordination and collaboration with CIRAD’s ASSET project, the CIRAD team participated in the ToC workshop, and they identified four areas of possible cooperation: soil health, legume mixed systems, forage and silage production and circular economy.

The issue of including fruit-based systems in the new project was discussed, but it was concluded that it was not one of the main government priorities. The current overproduction of low quality fruit in Son La province, and a lack of other easily accessible markets, supports this conclusion. In addition, research addressing fruit-based systems requires a completely different set of skills and the involvement of numerous additional research partners, which would make the project too large and difficult to manage.

The developed ToC for the crop-livestock smallholders’ farming systems development project is presented in the following section (Section 7.3)

7.3 Theory of Change for a climate change resilient, market-oriented and sustainable crop-livestock smallholder farming system in Houaphanh and Phong Sa Ly provinces

7.3.1 Theory of Change

Goal: A climate change resilient, market-oriented and sustainable crop-livestock smallholder farming system developed that integrates the production of maize, legumes and grasses with improved beef cattle and buffalo husbandry in Houaphanh and Phong Sa Ly provinces

Objectives

1. Evaluate the land potential for crops and cattle raising in SopBao, Xiengkho, Et, Muong May & Samphan districts of Lao PDR using remote sensing, GIS and participatory land use planning.
2. Identify the stakeholders capable of driving the development of market-oriented integrated crop-livestock systems using planning.
3. Co-design crop and livestock farming models with identified stakeholders based on participatory land use plans suitable to local conditions targeting local communal and district markets to increase food variety and security; broaden domestic and export markets, including Vietnamese and Chinese markets, to increase income.
4. Pilot the most promising models, some focusing on increasing local food variety and security and some targeting domestic and export markets.
5. Build the capacity of local extension staff, farmers and traders on farming management and market development to support the implementation and scaling up of pilot models.
6. Support local government to develop plans and supporting mechanisms to scale up the models to a commercial level.

Strategy

Diagnostic phase (Months 1 to 12): Study current and identify potential crop-cattle farming systems using a combination of objective measurements to evaluate natural indicators (GIS) and participatory methods to evaluate stakeholders' perceptions and aspirations about farming systems and their capacity to implement them.

Design phase (Months 13 to 18): Multi-stakeholders co-design crop-cattle farming systems specific to particular locations and mapping these elements to outline the whole system, including associated supply chains.

Pilot phase (Months 18 to 42): Action research to test the feasibility of several prospective crop-cattle systems feeding into a range of existing and pilot supply chains.

Institutionalization phase (Months 6 to 48): Capacity building of individual institutions to scale up successful systems; develop policies to support the implementation of successful systems at scale.

Underpinning principles

- Use the circular agriculture approach in the production practices of smallholders.
- Conduct research in a participatory and transdisciplinary manner.
- Use participatory land-use planning underpinned with remote sensing and GIS mapping to integrate the crop-cattle production model with other land-use options, particularly fruit production, to maximise the sustainability and productivity of the whole system.
- Utilise Vietnamese research institutions, Son La extension services, and a significant number of farmers who have developed substantial knowledge and skills in sustainable maize production management and transitioning into fruit and vegetable production, as well as an established network of Vietnamese traders operating in Houaphanh province, to deliver project activities and become active actors in the development of Houaphanh and other bordering provinces.
- Monitoring, evaluation and learning cycles are continuously implemented.

Intermediate outputs

Diagnostic phase

- Report characterizing current farming systems from economic, environmental, social and human perspectives
- GIS map and accompanying report identifying suitable farming systems for specific locations.
- Report on participatory land use planning that overlays human capacities onto GIS mapping report.
- Report on stakeholder mapping and a working group established in each location to co-design farming systems.

Design phase

- Crop-cattle farming systems specific for locations designed.
- Processes for piloting described and indicators for success identified.

Pilot phase

- One farming system per location piloted and evaluated over 2 seasons with the participation of a broad range of stakeholders, including farmers, traders, government extension officers and input providers.

Institutionalization phase

- Continuous capacity building through on-the-job mentoring for project staff; traders-farmers field school training over 2 seasons; workshops for government officials and all stakeholders documented.
- Policy workshops and briefs, facilitation of cross border co-ordination in input supply and marketing.

Final outputs

- Landuse plans developed and presented to the government, and strategies for their implementation agreed.
- Crop-livestock farming system models demonstrated and documented.
- Supply chains for products from piloted farming systems developed and documented.
- Scaling up strategies documented and capacity of stakeholders from implementation developed.

Expected outcomes

- Improved government capacity for landuse planning and inclusive decision-making, taking into account farmers, traders and other stakeholders' opinions, aspirations and vision.
- Piloted farming systems operating and connected to markets through functional supply chains.

- Improved support systems, including adequate policies, improved extension systems and availability of material and financial inputs.

The graphic representation of ToC is presented in Figure 1 (see 2.1 The Executive Summary).

7.3.2 Stakeholders of the crop-livestock smallholders' farming systems development project

The stakeholders of the crop-livestock smallholders' farming systems development project based on this ToC are presented in Table 2.

Table 2: Stakeholders of the crop-livestock smallholders’ farming systems development project

Primary stakeholders – those who benefit/are affected by the change	Secondary stakeholders – those who instigate and/or facilitate the change	External stakeholders – those with influence but no immediate active role
<ul style="list-style-type: none"> • Farmers (men and women) • Farm households • Farmer cooperatives and other forms of farmers’ organisations • Vietnamese and local processors (i.e. cooperatives and enterprises that process maize, cassava and other crops) • Cattle feedlots and exporters • Vietnamese and local market actors (supply chain partners): produce consolidators, including collectors and assembly traders; exporters, institutional markets/buyers • Suppliers/service providers: farm input, raw materials, logistics • Finance institutions: micro-finance providers, credit cooperatives, rural banks, informal lenders 	<ul style="list-style-type: none"> • Researchers/Research institutions – Laotian, Vietnamese and international • Extension Workers • Local Government Institutions: PAFO, DAFO and commune-level government units • People’s Organisations (Mass organisations), primarily Farmers’ and Women’s Unions • Processors and manufacturers of the final product primarily of animal feed (e.g. CP) • MARD (Vietnam) MAF (Lao) • ACIAR 	<ul style="list-style-type: none"> • Consumers and consumer associations • International development partners (FAO, ILRI) • ODAs (Aus DFAT, JICA, GIZ, ADB, UNDP) • National Government Departments non directly involved in agriculture

7.3.3 Research partners for the implementation of the crop-livestock smallholders' farming systems development project

International

The University of Tasmania

The University of Queensland

CIRAD-Centre de coopération internationale en recherche agronomique pour le développement

Vietnam

Soil and Fertilisers Research Institute (SFRI)

Northern Mountainous Agriculture and Forestry Science Institute (NOMAFSI)

National Institute for Animal Science (NIAS)

Tay Bac University

Lao PDR

Department of Agricultural and Land Management (DALaM)

Department of livestock

National Agriculture and Forestry Research Institute (NAFRI)

National University of Lao (NUoL)

8 Impacts

8.1 Scientific impacts – now and in 5 years

The SRA outputs are not suitable for a journal paper; however, they contribute to results and outputs from project SMCN/2014/049 and publications from that project.

8.2 Capacity impacts – now and in 5 years

The project built the capacity of various stakeholders, including staff from research organisations (SFRI, NOMAFSI and DALaM), government institutions (DARD Vietnam and PAFO and DAFO Laos), and private sector stakeholders in developing a Theory of change framework.

8.3 Community impacts – now and in 5 years

The SRA was designed to inform the development of a new Project in Lao PDR and provide additional information to project SMCN/2014/049. There were no expectations for the impacts as the result of the SRA implementation, but rather through outputs from SMCN/2014/049 and the implementation of the future project based on developed ToC in Lao PDR.

8.4 Communication and dissemination activities

ToC and learnings from ACIAR projects SMCN/2014/049 and LPS/2015/037 will be communicated through policy briefings and workshops, which are part of SRA SLAM/2023/106.

9 Conclusions and recommendations

1. There are very different development situations in Son La and Houaphanh provinces. Son La province has achieved improvements in the sustainability of maize production and is well advanced in the diversification from maize production into systems that target fruit and vegetable production. In contrast, Houaphanh province is still developing maize production as a cash crop for export to Vietnam and cattle production for export to China. In Son La, there is a well-established network of traders reaching into Houaphanh province and maize primary processing facilities using maize from Laos as input materials. Vietnamese research institutions, Son La extension services and a significant number of farmers have developed substantial knowledge and skills in management of sustainable maize production systems, as well as the transitioning into fruit and vegetable production. There is also a legal and inter-government institutional framework for cooperation between Laos and Vietnam that aims to provide Vietnamese support, and in particular support from Son La province, in the development of Houaphanh and other bordering provinces in Laos.

It is recommended that future ACIAR projects utilise these capacities and work with Vietnamese institutional actors and traders to strengthen the capacity of Laotian counterparts to improve the profitability and sustainability of maize production and develop diversified farming systems that include livestock and horticultural production.

2. One of the key components of improving sustainability and income security for farmers living in the remote, often isolated communities in the steeply sloping lands along the Laos border with Vietnam will be livestock production. Enhancing forage production has already been shown to be feasible, and a useful practice that can help to stabilise slopes and reduce erosion. The use of that forage to support increased livestock numbers is also feasible, as there are substantial markets in both Vietnam and China and supply of animals to those markets can be timed to avoid the access issues associated with the remote localities that suffer from limited access during the rainy and immediate post-rainy seasons. The biggest constraint to developing this capacity lies in the lack of animal husbandry expertise in those areas, with these skills in short supply in Houaphan and Phong Sa Ly provinces.

It is recommended that future ACIAR projects contribute to the development of skills and capabilities in animal husbandry, again utilising the capacity available in the relevant Vietnamese institutions and trader networks to train local counterparts in Laos. Such capacity building will enhance the confidence of farming communities in northern Laos to embrace livestock production as a profitable and complimentary activity that can be integrated with the production of cash crops to deliver improved living standards.

3. The focus of the Son La government institutions, cooperatives and enterprises is on adding value and market differentiation of Son La fruit and vegetables through improving quality and obtaining safe production certification and branding, in an attempt to overcome the reduction in income due to oversupply. The Son La government has also introduced policies to encourage production with an organic

orientation, which has gained less traction with the private sector and farmers. There is significant development of processing infrastructure but a lack of production tailored towards processors' needs that would increase farmers' income by developing production protocols for processing quality fruit and vegetables.

The recently concluded ACIAR fruit and vegetable projects significantly contributed to the establishment of a profitable, sustainable and safe horticultural industry in Moc Chau, which has captured a large proportion of Hanoi's high-value markets and is now extending to other urban centres, including Ho Chi Minh City. It is recommended that future ACIAR projects focus on a) developing production tailored towards processors' needs that would increase farmers' income by developing production protocols for processing quality fruit and vegetables; b) improving post-harvest handling to be able to store fresh produce for a longer time, to prolong the sale period and avoid a drop in price during peak production periods. Improved post-harvest handling would also enable the longer transportation needed to reach distant export markets; c) development of quality control and traceability systems to support certification of origin and safe practices and branding; and d) introduction and commercialisation of new fruit varieties and development of value chains to market fruit of these varieties.

4. Village authorities, farmers and traders identified poor roads, inadequate government sponsored contract arrangements between traders and farmers and difficult access to finance for very expensive inputs as major obstacles for improving maize production. Traders also requested the local government to provide incentives, including access to preferential loans and land concessions to build maize drying facilities. Farmers and village authorities also requested support to diversify into fruit production, especially orange, mango and longan, and raising beef cattle. We recommend that the future ACIAR project focuses on increasing profitability and sustainability of maize farming by including legumes and combining with improved beef cattle production. Fruit production has less market potential because of overproduction of fruits in Son La province, but as such production could improve nutrition of the local population, it could also warrant future ACIAR investment.

10 Appendixes

10.1 Appendix 1: Report on pre-workshop consultation in Son La Province 2-5 June 2022

10.1.1 BRIEF INTRODUCTION

Before the TOC workshop, a study was conducted to understand the status, obstacles, vision and need for change to sustainable agriculture development from different views of provincial agencies and separated district stakeholders in Son La province.

The study was conducted in Son La, focusing on three districts: Yen Chau, Moc Chau and Van Ho, from 2nd to 5th June 2022.

The qualitative research method was utilized in this study with semi-structured interviews and focus group discussions. Six interviews by direct meetings were applied to local leaders and managers (including a Vice-Director of Son La DARD, a Vice-Director of Son La Division of Crop Production and Plant Protection, 01 Vice-Chairman of a district and 3 agriculture managers from districts of Yen Chau, Moc Chau and Van Ho) to talk about the status, plans and strategies of agriculture development at the localities. Meanwhile, the focus group discussions were applied to 21 local farmers, cooperatives, traders and extension managers to understand their business, obstacles, interventions, expectation and vision for the future, and their development needs. The study then explored more data from related legal documents to overview agricultural production in the Son La context. Then, comments and feedback from other stakeholders for change of local agricultural production were collected to understand further the local production and livelihood and their change for economically and environmentally sustainable and climate change resilient sloping land agricultural systems.

10.1.2 FACTS AND FINDINGS

Agricultural production in Son La

Son La has 409,321ha of agriculture cultivation. The province emphasises some typical crops such as maize production (85,302 ha; 364,220 tons); mango (18,918 ha; 54,274 tons); longan (18,702 ha; 89,379 tons); plum and apricot (11,507 ha; 62418 tons); banana (5,350 ha; 45,813 tons). Currently, the province has 18 products with geographical indication certification, trademarks, and collective trademarks; 158 safe supply chains for crop production; 181 production unit codes for fruit export; 500 agriculture product processing units; over 300 agriculture cooperatives. The local authority promulgated several policies to support production development, including Decision No 860/QĐ-UBND by Son La People's committee dated 10/5/2021 to support the application of high-tech in the development of safe and sustainable agriculture in the period of 2021-2025 with orientation to 2030; the Decision No 1335/QĐ-UBND dated 18/6/2021 by Son La People's committee to support sustainable development of livestock to 2025 with orientation to 2030; and the plan No 117/KH-UBND dated 18/4/2022 by Son La People's committee to implement the strategy of sustainable agriculture and rural development in Son La from 2021 to 2030 with orientation to 2050. All these policies focus on supporting the development of production, processing and consumption of safe agricultural products. Accordingly, the members of cooperatives and enterprises receive a lot of support when they export agricultural products, register for a certificate of good agricultural production under VietGAP and Global G.A.P. standards, build a product traceability system, and introduce export codes. Farmers, especially cooperative members, have access to loans with lower interest rates at commercial banks and People's Credit Funds for funding infrastructure, including access roads, irrigation and warehouses, and business and production development.

The objective for 2025 is for the province to have 13,179 ha with VietGAP, GlobalGAP. certified production, which will increase to 39,700 ha by 2030. Livestock production applying safe production standards should reach 14,900 tons by 2025, and 325 agricultural cooperatives should apply high technology in producing and processing agricultural and aquatic products, reaching 605 cooperatives by 2030. OCOP (One Commune One Product) and other 3, 4 and 5-star trademark products will be developed and maintained. The proportion of high-value agricultural products applying high technology will reach 20-40% of the province's total agricultural production.

However, there are many obstacles facing agricultural production in Son La, including 1) small-scale production; 2) limited knowledge of production techniques; 3) low quality of some products at some localities; 4) some products with high costs and poor market competitiveness; 5) Unstable markets for agriculture products; 6) ineffective value chains connection; 7) low processing capacity and lack of cooperation between processors and farmers; 8) low product value due to overproduction and low quality.

The provincial government's expectations and vision for agricultural production development include 1) Developing smart, organic-oriented agriculture with high-tech and large-scale production and developed processing of longan, banana, plum and mango, 2) Nursery production development (mango, longan, plum, orange); 80% seedlings produced by high tech; 100% varieties have their traceability of origin; 3) High-tech application in production (e.g. seedlings production; irrigation), 4) Safe and sustainable production of VIETGAP, GlobalGAP, safe and organic products; 5) Development of agriculture products for processing and export; 6) Development of production areas with trademark registration; 7) Development of production areas focusing on ecological tourism, e.g. pick-up your strawberries; 8) Development of 30 new OCOP products besides 61 existing products; and 9) Development of preliminary treatment, packing, post harvesting store. Regarding livestock production, the province will concentrate on transitioning to large-scale production based on market demand and disease control. The key values will be the highly competitive livestock and poultry products

Agriculture development in Yen Chau district

Current status of production

Maize grown on 8,600 ha is the key crop in the district. It is followed by sugarcane and cassava. Mango (local mango and some imported varieties from Taiwan and Thailand), longan, banana and plum are key fruits grown in the district. The district registered two OCOP products: dried banana and mango. The local products (mango and longan) have been exported mainly to China, but some were exported to the EU, Australia, and the US. However, most of the agricultural products have been sold domestically outside the provinces.

The obstacles to production development

The local authorities and management stated, “the changeable weather affects their local products’ quality”. The crop production is facing difficulties in irrigation due to the steeply sloping land. The other obstacle is the lack of cultivation techniques for off-season and high-value products and poor processing capacity. Additionally, the investment for extension is very limited. Furthermore, the limited farmers’ understanding of production and their poor investment in farming have been limiting the improvements in their production. As stated by the district’s vice chairman, “there are 60 cooperatives established in the district, but only 10 cooperatives could develop their businesses, while others have very low management capacity”.

Farmers stated five obstacles, including 1) High cost of inputs in maize production (the price of maize seeds is 100,000 VND/kg in 2022) but low maize price (the price did not cover the cost of investment in 2021). Maize is also affected by pests (armyworm); 2) Mango had a low price in 2021, but after COVID-19 restrictions were lifted, the price recovered for good quality mango but for lower quality low prices persisted; 3) Limited selection of fertilizer suitable for safe production; 4) Low quality of fruit products; 5) No stable market for selling of fruits, buffaloes and beef cattle.

The cooperatives identified six obstacles: 1) Members’ capacity in production is limited (traditional habit of farming, do not follow the instructions of production protocols, limited investment in production; 2) Unstable market and prices; 3) No investment budget for organic production model; 4) High-quality requirements from the high-value markets; 5) Long term storing of products-lack of postharvest facilities and technologies; 6) Low commitment from members to following safe and organic production protocols and to sell products to cooperatives.

The traders stated that their obstacles include 1) Budget for investment in input materials (seeds, fertilizers, pesticides); 2) Limitation of local farmers’ understanding and commitment to production protocols and delivery of products; 3) Low quality and high price of input materials; 3) Unfavorable natural condition for production (water for irrigation); 4) Unstable market for fruit products

The extension staff defined some difficulties for their tasks to promote sustainable production development, including 1) Impacts of pests and diseases on crop production and livestock raising; 2) Impacts of changeable weather on crop production; 3) Limited budget for extension activities.

Plans/expectations/objectives and vision for sustainable development of agricultural production

The local authorities shared that they will focus their attention on promoting the development of intensive longan, mangos, plum and banana planting with an organic orientation with a special focus on VietGAP production of local mango (Yen Chau mango).

No expansion of farming area but high-value focus. They defined that maize will be one of the key crops on sloping land where it cannot grow fruit or other crops for livestock. The district would like to encourage cooperatives to support farmers in the production and marketing of products. The locality will call for investment to develop fruit production and processing infrastructure to improve the values of fresh fruit. Moreover, the authority emphasized the investment in processing for export to EU and Korean markets and called for investment to develop macadamia in four communes on the border with Laos.

The local farmers would like to improve their maize and mangos production and buffalo and cattle raising. They also would like to develop ecological tourism activities in the villages. The local cooperatives expected to primarily focus on developing mango, longan and plum production following the organic orientation with a focus on VietGAP). The traders would like to build postharvest facilities and processing factories. Furthermore, they want to expand their business with a much bigger investment. Meanwhile, the extension staff concentrated their plans on the development of the production zone with high-tech applications and organic orientation production

Needs for support

The local authority said there should be studies to improve the quality of the local-native fruit and better postharvest technologies and facilities to preserve products longer before marketing. Development of production protocols with an organic orientation that promotes the reduction in the use of chemical fertilizers, pesticides and herbicides to protect the environment and people's health. The investments should be in processing technologies and infrastructure. The cooperative capacity and farmers' understanding of and commitment to sustainable production should be improved through technical training, monitoring and evaluation, lessons learnt from pilot models, and market information sharing.

The traders need access to loans for investment in farmers' production and business expansion. The cooperatives need training and technical support to improve the quality of the products, funds to invest in farmers' production, information on markets and stable buyers and official product trademarks. Similarly, local farmers need technical guidance on producing high-value crops with less environmental impact and the provision of good varieties for maize and mangoes. Farmers wish to have a stable market for their products. The extension staff needs more staff for extension activities and a budget to be able to provide technical support to farmers and establish models.

To sum up, in Yen Chau district, the government focuses on production with the organic orientation (including VietGAP and GlobalGAP) of their key local products, mango, longan, plum and banana. The organic orientation is supposed to increase the value of local products and reduce pesticide use. Another focus is the increase of product quality and value through the application of high-tech and seeking trademark and OCOP registration, production unit codes and traceability of origin, especially for mango, longan, plum and banana. Government officials, cooperative directors and traders equally see the need to raise the farmers' awareness of quality requirements and other market preferences and to improve farmers' capacity to produce high-quality, safe products, especially fruits that could be exported, sold in premium domestic markets and processed locally. Cooperatives' management capacity should be increased to facilitate processes of production capacity building of their members and to develop new high-value markets for their products. Cooperatives also should be involved in processing. Finally, dependence on the government budget to finance agribusiness development should be reduced and largely replaced with loans from commercial financing institutions, preferably with reduced interest rates like loans from Agribank.

Yen Chau district

<p>Crop products</p> <ol style="list-style-type: none"> 1. Maize –main broadacre crop 2. Native and introduced mangoes from Taiwan and Thailand 3. Plum 4. Longan 5. Banana 6. Hemp (<i>Cannabis sativa</i>) <p>Livestock</p> <ol style="list-style-type: none"> 1. Beef 2. Buffalo 3. Chicken 	<p>Difficulties</p> <ul style="list-style-type: none"> ▪ Too much rain leading to landslides and crop losses ▪ No irrigation on slopes, low processing infrastructure, and poor management and lack of mechanization for high value off-season products ▪ 60 cooperatives were set up but with a poor management capacity, only 10 were able to develop their businesses ▪ Low investment in agricultural extension ▪ Farmers' technical and market knowledge is still limited 	<p>Orientation, plans</p> <ul style="list-style-type: none"> ➢ Develop intensive farming of longan, mango, plum, banana using organic production principles, especially focusing on VIETGAP production for yen Chau mango -Do not expand planting area but focus on high value ➢ Maize remain the staple crop on sloping land ➢ Encourage cooperatives to support farmers in producing and selling products ➢ Developing fruit production, processing logistics, infrastructure to improve the value of fresh fruit ➢ Processing for the EU and South Korea markets ➢ Investment and development of macadamia and hemp production in 4 border communes
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Development aspirations

Agricultural development following organic production orientation

<p>Production</p> <ol style="list-style-type: none"> 1. Research to improve product quality and value, reduce pests and diseases 2. Applying high technology to production 3. Grow organic and safe products (mango, longan, plum and local banana) - VIETGAP, GLOBAL GAP 	<p>Markets</p> <ol style="list-style-type: none"> 1. Trademark registration, planting area code; Traceability for longan, plum, banana and OCOP products 2. Stable market 3. Investment capital for business development including production and marketing 	<p>Policies and capacity building</p> <ol style="list-style-type: none"> 1. Production technical training (focus on fruit) 2. Policies to improve investment environment 3. Raising awareness of farmers on sustainable farming 4. Improve cooperatives' management capacity and supporting policies
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Agriculture development in the Moc Chau district

Local current status of production

The district focuses on producing vegetables grown on over 4,000 ha, with brassica crops (cabbage, Hmong mustard and cauliflower), French beans and pumpkin dominating in terms of volume but with tomato and lettuce significantly contributing in terms of value. Even though vegetable production was Moc Chau's development focus in the last decade, fruit production remains a major contributor to agricultural production with 3,700 ha of plums, 1,500 ha of avocado, 1,500 ha of mango and 1,500 ha of longan. Production of strawberries developed significantly in the last five years. Even though reduced with fruit and vegetable production expansion, maize and tea are still major crops in Moc Chau. The production of maize for silage to satisfy the needs of the growing dairy industry increased significantly. Moc Chau's products have been exported mainly to China, with a much smaller volume being exported to the EU, Australia and the USA. Moc Chau is a very important supplier of vegetables and fruit for Hanoi markets, including major supermarket chains. Strawberry production and dry fruits (plum, mango, banana) are mainly for local tourist market.

The obstacles to production development

The local authorities and agricultural managers stated that organic and safe production requires high investment, but the price of safe and organic products is not proportionally higher to the increase in production costs making a transition towards organic and safe production difficult. Additionally, farmers' limited understanding of sustainable production and markets is another constraint to the development of sustainable production in the locality. Moreover, the budget for extension is very limited, so they could not invest in pilot models or high-tech applications in the districts.

Meanwhile, local farmers said they "lack funding for production investment" and knowledge about organic and safe production techniques. They also mentioned the unstable markets in terms of demand and price for fruits and vegetables. The major challenges for cooperatives include members practising traditional farming and not being motivated to change; the unstable markets and demand for high quality from premium markets; the difficulty in the long-term preservation of products; and low commitment from members to follow production protocols developed by cooperatives and to sell products to cooperatives. Similarly, the traders stated that the limitation of local farmers' understanding of and commitment to sustainable production is also their challenge. They pointed out that an unstable fruit product market affected their business. Furthermore, traders have a limited budget for investment in input materials (seeds/seedlings, fertilizers and pesticides), especially because prices of all input materials went up significantly, so they are not even sure if they will recover costs from the sale of farmers' products. The extension staff identified the lack of funding to promote sustainable production as a major problem.

Plans/expectations/objectives and vision for sustainable development of agricultural production

The authorities emphasized that the locality would like to develop its production of high-standard fruits and vegetables certified as safe or organic with high values. The district extension manager clarified that their activities concentrated on developing organic orientation production, OCOPs, PUC, and crop and livestock protection. Specifically, farmers are interested in developing OCOPs and ecological tourism in their villages. The cooperatives stated that they would give their priority to organic-oriented production with a focus on VIETGAP standards and improving the value of products (mangoes and some

other fruits such as plums and longan). Similarly, the traders said they expected to expand their business on sustainable organic products of high quality.

Needs for support

To achieve above objectives and expectations, the local authorities proposed studies and interventions to improve the quality of the local fruits. Moreover, they suggested a need for support in storing agricultural products longer before selling them. Some technical suggestions included: 1) the less use of chemical fertilizers, pesticides and herbicides to protect the environment and people's health, i.e. organic orientation, 2) the provision of technical guidance and expert support through better-funded extension services or from input suppliers, 3) some support to promote the temperate fruit (peach, apple, plum, pear) with high-quality varieties. Farmers in Moc Chau need access to better varieties, technical support and pilot orchards with new and good varieties to diversify and increase the value of their production. They need technical and financial support to develop OCOP products engaged with tourism. In the long term, local farmers are interested in stable markets. The markets are also the cooperatives/ and traders' concerns. While the cooperatives worried about unstable markets for their products, the traders said they needed better market information. Both cooperatives and traders in the Moc Chau district are interested in access to capital to invest in the production and expansion of their trading business.

In summary, Moc Chau district focuses on the organic and safe production of their key local products, vegetables, strawberry, mango, and plum. However, when they talk about organic production, they are not talking about fully certified organic products but products produced with reduced use of mineral fertilisers, increased use of organic fertilisers, and reduced number but well-timed pesticide applications. Regarding certification, the goal is VietGAP and GlobalGAP. Stakeholders are aiming to apply high-tech to increase product quality and get better and more stable access to markets. All participants agree that they need more capital to invest in production, and extension services need an increase in the operating budget to support the farmer to improve production and adjust to market demand.

Moc Chau district

Crop products

1. Vegetables mainly in summer (off-season)
2. Fruit-plum, mango, longan, avocado, citrus and strawberry targeting tourists

Livestock:

1. Beef
 2. Buffalo
- Fruit is exported to China, Australia, EU and US
 - Vegetable-major supplier of supermarkets in Hanoi and other city centers in northern Vietnam
 - Fruit and vegetable for processing and wholesale markets.

Difficulties

- Investment in organic production is high but difficult to sell for premium price; the selling price is not equal to the investment cost
- Low investment for agricultural extension activities
- Farmers' knowledge in production and markets is limited

Orientation, Plans

Developing high value and quality standard vegetables and fruits

Necessary activities

- Research and interventions to improve the quality of local fruits; prolonging and improving postharvest storing before market
- Less use of chemical fertilizers, pesticides and herbicides to protect the environment and human health, organic direction
- Technical support (technicians, technical experts, high-tech application models)
- Support the development of temperate fruit industry (peach, plum, pear) based on high quality varieties

Development aspirations

Organic, safe production and ecotourism

Production

1. Research to improve product quality and value, reduce pests and diseases
2. Applying high technology to production;
3. Developing safe and organic products (mango, longan, plum and local banana) - VIETGAP, GLOBAL GAP

Markets

1. Trademark registration, Production unit code; Traceability for longan, mango, plum, banana and OCOP
2. Stable markets
3. Links between cooperatives and actors in the supply chain
4. Investment capital for business development including production and marketing

Policies and capacity building

1. Policies to support access to finance
2. Production technical training (focus on fruit)
3. Raising awareness of farmers about production and markets

Agriculture development in the Van Ho district

Local current status of production

Vegetables and citrus are the main crops of the district. Like in Moc Chau, cabbage, Hmong mustard, cauliflower, and French beans dominate in volume, but tomato and lettuce significantly contribute in value. Besides crops, livestock, including pigs, buffaloes, and beef and dairy cattle, are also important. The local products were exported mainly to China and in small volumes to Australia and the USA. Several processing factories have been established in Van Ho, including TH and IC food. Even though they are buying small volumes at the moment, they are expected to buy much more vegetables and fruit soon. However, Hanoi and the surrounding provinces are the main markets for Van Ho products, with around 10-15 % of total production reaching supermarkets and other premium retailers. The district extension activities focused on 1) fruit development on sloping land, 2) high-tech, safe and organic production, 3) enhancing farmers' awareness of safe and sustainable production. However, local farmers face difficulties in selling fruits and vegetables, especially non-VietGAP certified and in the winter season.

The obstacles to production development

The agricultural managers emphasized that local production is mainly small-scale production at a household scale. In addition, the local farmers' understanding of sustainable production is not good enough, and their investments in sustainable farming are very limited. As a result, overuse of fertilisers and pesticides is common. Farmers' commitment to selling their products to enterprises and cooperatives is not strong, and they will sell on-spot if traders offer a higher price. In recent years, bad weather, landslide, and heavy rain have seriously affected local agriculture production. Overall, markets for local products are the biggest concerns of the farmers, authorities and other stakeholders.

From farmers' perspectives, the main problems are pests affecting maize and fruits, livestock diseases, lack of funding for investment in production and limited knowledge about techniques for safe production and production follow "organic orientation". The local cooperatives are facing unstable markets for selling products. Furthermore, they have the same concern as the authority of low commitment from members to follow safe and organically oriented production protocols and to sell their products to cooperatives. As explained by the interviewees, many local farmers still practice conventional farming and do not follow the technical guidance on sustainable production. Similarly, the extension staff pointed out that local farmers' traditional farming techniques are their obstacles when delivering the training at the villages. They found that local farmers often violated production regulations. Extension staff have a limited budget for supporting farmers and other beneficiaries to follow high-tech, safe and organically oriented production.

Plans/expectations/objectives and vision for sustainable development of agricultural production

The agriculture management managers expect their local products will be of high quality and competitive in the markets. They especially hope that vegetables keep spearheading the development of agricultural production in the district. Meanwhile, the local farmers would like to keep producing maize and cassava alongside with vegetables and fruits. The interviewees said they are interested in producing organic fertilizers and developing fruit production (longan and oranges) in their villages. The local cooperatives expected to develop their production in the organic orientation with a focus on VIETGAP. The extension staff plan to improve the management capacity of cooperatives and support cooperatives to improve postharvest handling and storage, processing and transition production following organic orientation.

Needs of supports

The local authority, private companies and cooperatives directors, similar to other districts, think that research and development efforts should focus on improving the quality of the local vegetables and fruits and better postharvest technologies and facilities to preserve products longer before marketing. Development of production protocols with an organic orientation that promotes the reduction in the use of chemical fertilizers, pesticides and herbicides to protect the environment and people's health. There is a need for a significant increase in funds to train and support farmers, especially cooperative members, to implement safe and organically oriented protocols to improve product quality to be competitive in the market since they all think "stable markets are the most important concern of our members". In addition, investment into net houses and irrigation should be provided soon.

Van Ho district

Crop products

1. Vegetables (cabbage, tomatoes and some legumes)
2. Fruit trees: longan, mango, citrus (orange, pomelo)
3. Maize for livestock

Livestock

1. Cows for milk and meat
2. Buffalo
3. Pig

Difficulties

- Small production scale, sloping land => no large plantations
- Farmers' awareness is still limited in production and investment in farming (using a lot of chemical fertilizers and pesticides; commitment to providing their products businesses they have contract with
- Severely affected by nature-landslides and floodings
- The market for local products is unstable

Orientation, plans

- Local products will be processed into variety of products and highly competitive in the market
- Vegetables continue to be the priority for development

Necessary activities

- Research and interventions to improve the quality of local fruit and vegetables; prolonging and improving postharvest storing before market
- Less use of chemical fertilizers, pesticides and herbicides to protect the environment and human health, organic direction
- Provide technical support (technical, technical experts)
- Raising awareness of farmers in sustainable farming
- Investment in high-tech production (net house, ...)

Development aspirations

Organic and safe production

Production

1. Research to improve product quality and value, reduce pests and diseases
2. Applying high technology to production
3. Developing organic and safe products focusing on vegetables, citrus and other fruits - VIETGAP, GLOBAL GAP

Markets

1. Stable market for fruit and vegetable products focusing on domestic markets and processing of local factories
2. Investment capital for production development

Policies and capacity building

1. Training on production techniques focusing on vegetables and citrus
2. Raising awareness of farmers in production and market
3. Credit support policy

10.1.3 CONCLUSIONS

Even though maize remains a major crop in all districts, the focus of attention shifted to fruits, mainly on mango, longan and plum, and to a lesser extent on avocado and peach. Moc Chau and Van Ho have also strongly focused on safe vegetable production. In all three districts, cattle and buffalo production development was acknowledged as having great potential, but participants did not elaborate further.

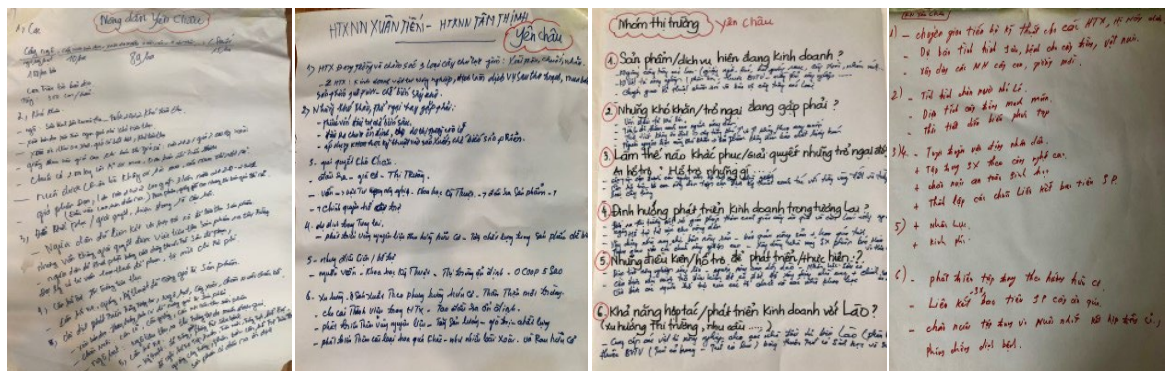
The local government wants to focus on the production of specific local products recognised by consumers, including local mangoes and plums in Yen Chau; vegetables, high-quality plums, peaches, avocados and strawberries for local tourist markets and high-value domestic and export markets in Moc Chau; vegetables and citrus in Van Ho. There are four groups of activities that have been receiving the attention and investment of the authorities and other stakeholders 1) Agricultural production with organic orientation applying high technology with priority given to VietGAP, GlobalGAP and OCOP products, 2) Improving existing local agricultural products' markets and expanding into new markets, including local markets boosted by agritourism, high-value domestic markets in Hanoi and other urban centres in the North and South and high-value export markets. To achieve this goal, the focus is on increasing product quality and obtaining certifications to convince consumers that products are safe and sustainably produced; 3) Improving postharvest and storage facilities and developing the processing industry' 4) Development of livestock production.

The main issues in these localities include: 1) Diversification from maize to fruit production resulted in an oversupply of mango, longan, plum and Hmong apple in the traditional domestic markets 2) Moc Chau and Van Ho developed large-scale vegetable production, especially in the rainy season but are reaching overproduction and need to improve postharvest and cool chains to extend markets in Hanoi and other urban centres; 3) Strong push towards organic orientation, safe production certification, branding and geographic indication including OCOP but in most cases farmers are not getting additional benefits; 4) A large number of newly formed cooperatives but majority without management skills and access to finance for investment

10.1.4 Recommendations for improvements:

- The localities need to specialise in production to meet the quality standards of different target markets. Any further development of the horticultural industries has to focus on improving product quality, postharvest handling and processing, not expanding production areas.
- The technical guidance should promote simple, sustainable, organically oriented practices that require reasonable investment. Implementation should be strictly monitored, and adequate guidelines and support should be provided. The evaluation of outcomes should be staged so practices can be modified and adapted to local situations.
- The farmers' capacity to practice sustainable farming and engage in marketing should be improved through regular training, coaching and communication.

Group discussion results-Kết quả thảo luận



Yên Châu District

10.2 Appendix 2: Report on ToC consultation workshop in Son La Province 8 June 2022

10.2.1 INTRODUCTION

The workshop aimed to identify the common needs for change for economically and environmentally sustainable and climate change resilient slopping land agricultural systems in Son La province.

To achieve the goal, specific objectives were focused on:

- a) To identify the local needs and obstacles for the change towards r economically and environmentally sustainable and climate change resilient slopping land agricultural systems in Son La province with a focus on three districts of Yen Chau, Moc Chau and Van Ho.
- b) To identify the strategies, stakeholders and interventions that effectively facilitate the change towards economically and environmentally sustainable and climate change resilient slopping land agricultural systems in the province and adjacent Laos border areas.

10.2.2 IDENTIFICATION OF LOCAL OBSTACLES AND EXPECTATIONS AT THE WORKSHOP

Identification of obstacles by farmers and agricultural production cooperatives

Crop production

Regarding crop production, from farmers' and cooperatives' views, farming on sloping land is faced with soil erosion and landslide; weeds and degraded soil; difficult transportation; very limited opportunities to intensify and mechanise production. Some technical measures were suggested to address these problems, including developing modern fruit plantations with drip irrigation in flat areas. They also worried about the fruit varieties they have been growing, many of which are of poor quality and unknown origin. They have difficulties accessing new varieties, so they are limited to cultivating very few varieties ripening simultaneously, resulting in a short harvest season. To address this problem, it is necessary to improve the nursery industry, not just the production itself, but also IP regulation and management to be able to gain access to modern varieties with IP attached. The vegetable seeds problems can be solved easier by selecting reputable suppliers or looking for good varieties online.

Fertiliser quality is their other concern. They mentioned the chaos in fertilizer markets, low quality and fake fertilisers. They see the solution to the problem as finding reliable information and reputable fertilizer supplies and shops.

Other difficulties include limited use of modern technologies, unstable markets and bad weather. They suggested some actions to overcome these obstacles, including learning how to grow fruit and vegetable off-season, changing farming practices, selecting good varieties, and introducing new technologies in production and postharvest (but it requires a large investment). Regarding the cooperation between Vietnam and Laos in crop production, farmers stated they could share experience in producing maize, rice, fruit, buffalo, and beef. Local farmers and authorities said that they are willing to have relations with Laotian farmers and cooperatives

Market

The farmers and cooperatives emphasized that the market for selling their products is their big concern. At present, most fruits do not meet the quality requirements of the domestic institutional and export markets. The reasons are farmers' limited knowledge, low production investment, and limited technology application. In addition, some areas and households face difficulties in production due to bad weather and markets. They expected to learn and apply new science and technology initiatives in production and have long-term contracts to sell their products and apply modern technology in their production for better quality products such as organic orientation products or VietGAP products. Furthermore, they find it difficult to access loans from the banks (loan amount is relatively low); they expect relevant credit policies to finance input materials, production, and marketing to soon be implemented.

The market for agricultural products is unstable; the price of varieties and materials has increased; farmers made large investments due to high costs but achieved low income and profit and faced high competition with other localities. The complicated contract procedure to sell products to the processing companies, compounded with the cooperatives' directors' low management skills, prevent the full benefits of the recently developed processing infrastructure in Son La from being realised. Finally, poor postharvest storage capacity, especially a lack of cooling facilities, results in a high influx of products at certain times, significantly reducing prices and causing product losses.

To overcome these difficulties, farmers and cooperatives suggested that crop production should focus on high-quality products following safe production protocols linking production with the markets' requirements. The focus should be on locality-specific products for which there are good natural conditions (OCOP concept). The cooperatives' capacities should be improved, including management skills, infrastructure (cool storage and packaging) and finances. Cooperatives should develop long-term formal relationships with processing factories, institutional markets and exporters. The cooperatives should also develop reputable brands.

Identification of obstacles and expectations by traders

Crop Production

The traders identified nine main obstacles as follows: 1) Difficult farming locations resulting in expensive transportation with high product losses; 2) Farmers' low investment in production, including labour, materials, fertilizers, plant protection and high quality seedlings compounded with fake and low-quality input products; 3) Farmers' limited use of technology and abuse of chemicals; 4) Farmers' production is not based on market predictions, but it follows current trends and availability of inputs; 5) Quality of farming products depend on seasons and weather with weather events becoming more unpredictable and extreme; 6) Farmers' limited understanding on organic farming techniques and process, including lack of care for the soil, not understanding of soil born diseases and abuse of pesticides; 8) Limited availability and understanding of market information (not focusing on learning and not understanding the product requirements of each market); 9) Weak linkages between farmers and traders.

To solve these difficulties, solutions suggested by traders include: 1) Conduct systematic research on the suitability of each plant and animal species and variety/breed to natural conditions in specific communes and districts, especially considering soil and climate conditions. The extension services should be enabled to use the results of this research and work with farmers in their implementation; 2) The research to improve soil fertility, use of fertilizers and pesticides, and develop new technologies; 3) Household-level training courses on the management of production and access to and allocation of financial resources to sustain production independently from input providers; 4) Develop policies to attract labour through economic efficiency in agricultural production; 5) Train farmers to find

and utilise relevant market information. Develop communication platforms to provide market information to farmers, cooperatives and other stakeholders; 6) Training on organic/organic-oriented agriculture for the whole system from farmers, extension officers, traders, and authorities; 8) Having policies, regulations and mechanisms to control individuals/companies who produce, import and trade seed, seedlings and other planting materials, fertilisers and pesticides/herbicides.

Market

Traders listed the following barriers to improving the marketing of agricultural products: 1) Market fluctuation and lack of updated market information, including data on demand for specific product quality for different markets; 2) Difficulties in accessing market information outside the locality, information about outside markets often provided by investors from these outside markets; 3) Difficult to develop a long-term relationship with cooperatives to develop and deliver production and marketing plans; 4) The products do not meet the markets' requirements, resulting in the low selling price; 5) Trading with Laos is still limited because of difficulties in transportation and product collection due to Laos' local policies; Supply of inputs in Laos is also difficult. 6) Postharvest storage, transportation and preliminary processing are not good enough for transportation to long-distance markets or export. In 2021 only 1 % of mango fruit could be exported to premium markets (US, EU, Australia and premium Chinese markets); 7) Farmers are in weak linkage with traders.

The traders expected the government to provide regular information about the market through local radio stations, cooperatives, producer groups and farmer associations. Invest in and support the development of postharvest facilities, processing factories and transportation infrastructure. They also expect the government to encourage the development of specialised production in certain areas and to establish mechanisms to enforce contracts.

They also want the government to build the capacity of cooperatives, especially management, infrastructure and operating capital. Traders' perception is that, at present, cooperatives do not operate according to the Cooperative Law, do not have a well-defined and viable business model, do not have adequate finance and accounting system and personnel, and many of them do not have certified planting areas hence can not provide the Production Unit Code (PUC). The traders also stated that cooperatives must improve their capacity to guide their members to produce according to the specific requirements of different markets. However, developing products to suit different markets is not just a cooperative problem but applies to all stakeholders involved in agricultural production and trade, so it needs to be a priority for R&D investments by the government and private sector.

To improve trading with Laos, traders proposed free trade agreement between Laos and Son La. This agreement would remove the monopoly the Laotian local government gave to a certain trader to purchase products in a certain village. From the Laotian government's point of view, contracts signed with traders, which give traders a de facto monopoly, are there to protect farmers by guaranteeing the minimum price traders have to pay. In reality, on most occasions, the minimum price is well below the market price, so allowing competition between traders would, in most cases, benefit farmers.

Identification of obstacles and expectations by local authorities, government agencies and extension centres

Crop production

The local authorities, extension and agricultural agencies identified the following obstacles: 1) Low awareness of local farmers about sustainable farming practices; 2) Limited scope to use modern technologies, including mechanisation and production protocols on sloping lands; 3) Difficulty in using labour-intensive soil preservation and erosion management cultivation options; 3) Increase in weather unpredictability and in a

number of severe weather events that affected crop production; 4) The increases in prices of input materials and lack of labour.

The local authorities and agencies aspire to strengthen management and supervision of the implementation of technical protocols aligned with organic production orientation and sustainable farming on sloping lands. They suggested training activities to raise farmers' awareness of sustainable practices, including site visits to learn about the successful models.

Policies should be developed to encourage and support farmers to adopt sustainable practices, including the provisions of farming inputs and access to technologies, but in return, farmers should work hard and learn by doing themselves. Participants suggested several pilot models, including the use of agricultural by-products for mulching to prevent erosion and increase production; crop rotation and intercropping; agroforestry and keeping the forest in areas with slopes steep slopes (>25%); planting following contour lines and using minimum tillage with residue retention; planting trees according to "crocodile fangs" to limit erosion; planting legumes; transformation of crop structure with limiting the use of chemical fertilizers and increase the use of organic fertilizers.

Market

In terms of the market, the local agencies pointed out the weak connection between local production and the market, including trade promotion, product packaging and branding. The poor logistics, including transportation and storage facilities; the poor product quality; unstable selling prices and the competition with imported products.

The local agencies have been building brands for local products to increase market access and plan to continue to do that. They identified the need for training human resources to access market information and conduct advertising and trade promotion campaigns; linking all actors in the production and market chains; enhancing technical training to meet product quality requirements of the target market; investing in cold storage.

Regarding technical measures, they suggested focusing on crop diversification and off-season planting to prolong the marketing period and avoid oversupply resulting in low prices. Improve the quality of products and their postharvest handling to expand and diversify markets. Finally, infrastructure and human capacity should be developed for preliminary processing.

10.2.3 Summary of Barriers and Strategies

Note this is only a lightly edited summary written by stakeholders on butcher paper during the workshop

Sq	Barriers/Difficulties	Suggested strategies/activities
PRODUCTION		
1	Lack of information about markets and environmental suitability to support planning and decision-making on the type of crops and livestock to be promoted, resulting in massive overproduction and difficulties in marketing	Methodical research on markets and the suitability of each type of crop and animal to serve as a scientific basis for the planning of production.
2	The products' quality and packaging design is not good enough	Technical measures to improve quality, extend production season by off-season planting and introduce varieties with different harvesting times (early to late). Improve postharvest handling and packaging
3	Improper application (failure to follow) technical procedures Farmers' awareness on production is limited	Strengthening the communication, management and supervision of the implementation of technical processes
		Visiting and learning from successful models (learning by seeing, learning by doing); Building demonstration models
		Training farmers to grow products that meet the standards of buyers and processing enterprises
		Policies to support farmers to access suitable inputs and technologies to improve the quality and safety of products.
4	Lack of soil protection measures The application of sustainable farming practices is limited.	Improve processes for issuing Production Unit Codes for export.
		Sustainable farming technology: <ul style="list-style-type: none"> - Crop rotation, intercropping, legume crops over the years; Transforming crop structure - Agroforestry, contour planting, tree planting, SALTs - Do not plow the land on steep slopes - Planting trees in the form of crocodile fangs to prevent soil erosion - Keeping the forest in the area with high slope (> 25%) - Using agricultural by-products to cover the surface, prevent erosion

		- Limiting the use of chemical fertilizers, pesticides, and herbicides Increasing the application of organic fertilizers for fruit trees
5	The typical mountainous terrain land; The arable land is fragmented and on slopes, leading to difficult farming; It is not easy to provide irrigation and to manage crops	
6	Challenging climate, with extreme raining and dry periods affect production and quality of agricultural products. Climate change make wether events less predictable.	
7	Shortcomings in input materials (Very high cost of production inputs (fertilizers, pesticides, seedlings) The quality of planting material and inputs is not standard, it is difficult for people to distinguish good quality inputs	The government must be strict with fake and poor quality fertilizers and pesticides Mechanisms and policies to control individuals/units that produce seeds and planting material.
8	Lack of labour	
9	Cooperatives and farmer households have difficulty in accessing loans; Low loan limits; Farmers do not have money to reinvest and have to depend on loans	
10	Postharvest is still lacking: technology and equipment for primary processing and preservation	Researching on technical solutions to preserve agricultural products; Guiding farmers to cultivate to ensure postharvest quality, Building processing factories through various forms (attracting investments, government & stakeholders working together) Setting up cold storage systems
11	Farmers organization, business association: - There is a lack of cooperative organizations to link farmers' households - Lack of production linkages among cooperatives, especially in marketing - Sign sale contracts with enterprises and closely implement contracts between both parties Cooperatives do not operate according to the Law on Cooperatives, and do not operate as a business	- Establishment of cooperatives - Sign sales contracts with enterprises before production - Cooperatives must improve their capacity and capacity to access information on product requirements to meet difficult markets, thereby guiding members to produce products that meet requirements.

12	Traders have difficulty to provide support to farmers and procure large quantities of products because small-scale production	
13	Trading with Laos is still difficult: trading of cassava and maize is limited because , vehicles in Vietnam have to wait for goods, vehicles that do not carry goods cannot be transported. Vietnamese cars have slow procedures	Laos + Son La must have a free trade policy, removing the monopoly on purchasing, so that Lao farmers can sell products to traders at higher prices, creating favorable conditions for Vietnamese traders to transport products to Laos
MARKET		
1	Lack of market information Limitation of up-to-date market information and, business management capacity	Regularly update market information (product demand, quality,...) via local radio stations, cooperatives, farmers' groups, associations
2	Connecting the market (trade promotion, product packaging, and branding)	Building product brands (labels, packaging...); trade promotion, publicity (trade fairs, marketing channels, e-commerce exchange)
		Increasing access opportunities to market information, Connecting and providing information among actors in the chains
		Training human resources for products advertising and trade promotion
		Promulgating new policies and plans on markets fore output products
3	Storage and transport logistics	Government's investments Development policies
4	Product quality is not good enough and does not meet the quality standards	Support for synchronous farming techniques: varieties, technology on spread crop, garden improvement....
		Strengthening technical trainings for producers
		Producing according to the quality requirements of the target market
		Policies to support production
5	Unstable selling prices and quality of outputs	Planning production areas
		Investing on measures for preliminary processing, preservation, processing and diversification of products
		Expanding and diversifying consumption markets (domestic and export)
		Production according to the linkage chain (Production –Market)

6	No sales contracts with traders or enterprises or the contract tight contracts	Signing consumption contracts with enterprises (especially long-term contracts) and strictly supervising by the governmental agencies for the implementation of contracts There are sanctions to deal with violations of commitments
7	Competing with imported products	
8	Policies	

10.3 Appendix 3: Report on ToC consultation workshop in Houaphanh Province from 9th to 11th August 2022 and consultation process from 7th to 11th November 2022

10.3.1 Introduction

The project team cooperated with the relevant sectors (PAFO, PICO, DAFO, DICO, traders, and village authorities) to organise a TOC workshop. The overall objective was to understand the 5-year strategic plan and tools to disseminate the implementation of priority activities at the level of Huaphan province and the three target districts of the project, summarise them, and create a project proposal for the ACIAR organization from Australia to consider for adoption at the next level. The specific objectives of this workshop were to: 1) summarise policies that support agricultural and forestry production in Huaphan Province; 2) summarize the tools and mechanisms for the implementation of various policies to promote practical implementation at the provincial and district levels in Huaphan Province; 3) summarize the advantages, difficulties, and measures for future solutions to agricultural production along the Lao-Vietnam border; and 4) create a proposed plan for the development of the agricultural production system in the uplands of Laos to be sustainable in terms of economy, environment, and climate change adaptation.

The ToC workshop was held in Sam Nua from 9 August to 11 August 2022: the first day was for representatives from the government sector; the second day is for representatives from entrepreneurs (traders) in 3 target districts of the project; and the third day is for village authorities and representatives from farmers who work with the project in 4 villages and 3 districts. The government sector was divided into 2 sub-groups: the agriculture and forestry sector and the industry and commerce sector.

The post-workshop consultations were conducted with farmers and community leaders in Sop Bao, Xienkho and Et districts from 7th to 11th November 2022).

In this report, the results of the workshop and consultations are presented.

10.3.2 Development plans on ministerial, provincial and district levels-bases for ToC

The Ministry of Agriculture and Forestry operates based on the 9th 5-year Agriculture, Forestry, and Rural Development Plan (2021–2025), which is consistent with the government's 5-year socio-economic development plan (2021–2025) and has three pillars 1) agriculture, 2) forestry, and 3) rural development, with 4 programs and 13 supporting tasks.

Ministry of Agriculture and Forestry (MAF) level

Pillar 1: Agriculture

1.1. Food Security Program: It defines an agricultural production structure in terms of cultivation and animal husbandry, such as rice, food crops, commercial crops, livestock, and fish. Each province has an agricultural production structure according to the local potential, with a clear focus on specific production areas in order to strive to produce and supply enough rice, vegetables, fruits, etc., and has a portion that must be given attention to the production of important products as follows:

- ❖ Rice production is intended to meet both domestic demand and a portion of export goods. They focus on producing a total of 900,000 to 950,000 hectares of paddy rice by focusing on the production areas of seven large plains and other plains according to the special points of the area.

- ❖ Crop Production aims to produce food crops on approximately 261,710 hectares, including taro, sweet corn, vegetables, and fruit trees, and tries to produce a total of 32,752 hectares randomly in the provinces of Xayabuli, Udomxay, Luang Namtha, Vientiane, Luang Prabang, Xieng Khuang, Houaphan, and other provinces.
- ❖ Livestock and Fisheries: It is focused on raising cattle, buffalo, pigs, goats, sheep, poultry, fish and aquatic animals.

1.2. Agricultural production as a commodity program: There are production organizations like groups, cooperatives, MSMEs, and unit farms, with a policy to promote production, processing, increasing the value and quality of products, access to credit and the market, a transportation network, as well as supporting measures to reduce the impact of disasters.

- ❖ Commodities aiming to produce export products such as coffee require 96,094 hectares of the planted area, focusing on the plateau area in Phongsaly, Xiengkhouang, and Houaphan provinces. Most of the output is supplied to a few coffee processing factories for export and distribution within the country. b) It is estimated that 138.716 hectares of maize for animal feed will be planted randomly in Xayabuli, Oudomxay, Xiengkhuang, Houaphan, and other provinces. The overall goal is to supply food processing plants both domestically and internationally. C) cassava: focus on the provinces of Xayabuli, Saravan, Champasak, Savannakhet, Nolikhamxay, and other provinces that are good in production, aiming to produce 3.6 million tons of feed for cassava factories and export some dry cassava to Vietnam and Thailand on 108,460 ha of the planted area. There are also a number of other plants, such as potatoes, sugarcane, bananas, tea, legumes, and sweet potatoes.
- ❖ The promotion of livestock, fish, and aquatic animals aims to produce 250,000 cows per year for export to China.

Pillar 2: Forestry

The forest protection management program aims to make forest land cover 70 per cent of the country's area. 1.8 million hectares of forest land and 200,000 hectares of timber for commercial purposes to guarantee the supply of raw materials for domestic industries and reduce the import of timber by focusing on the following tasks: 1) management of protected forests, national parks, and world heritage; 2) management of protected forests; 3) management of production forests; 4) management of village forests and forest products; and 5) management of forest products. 6) Encouragement of tree planting and forest restoration; 7) Management of marine and wild animals and biodiversity; 8) Reducing greenhouse gas emissions caused by deforestation; and 9) Monitoring forests and forest resources.

Pillar 3: Rural Development and Poverty Alleviation Program

Rural Development and Poverty Alleviation Program Continue developing irrigation infrastructure and allocating land and occupation to farmers without fixed land and occupation. In the period 2021–2030, we aim to gradually improve the material and mental lives of the people, provide access to public services, increase incomes, and gradually get rid of poverty. In order to do that, it is necessary to focus on the following tasks: 1) development of rural infrastructure (public infrastructure, roads to production sites); 2) allocating production sites and income-generating occupations to the people; 3) building

development villages, building large villages into rural districts according to the standards in Decree 348/L; 4) and establishing the group and cooperative organization.

Support work:

There are 13 supported projects, which include: 1) The management and development of agricultural land and fertilizer, including a) land use survey and planning; b) agricultural land management; c) soil improvement, management, and fertilizer use; d) soil, fertilizer, plant, and groundwater research; and e) soil, fertilizer, plant, and groundwater research. 2) Agriculture development through irrigation, plant, animal, fish, wood, and fruit tree research and breeding 3) Planting technique and technology transfer; 4) breeding and processing; 5) production method improvement; 6) plant protection and quarantine work; 7) clean agriculture work 8) Creating capacity to reduce risk from natural disasters; 9) policy and legislation work; 10) inspection work; 11) work to improve organization and human resource development; 12) international cooperation; and 13) integration of production and marketing data

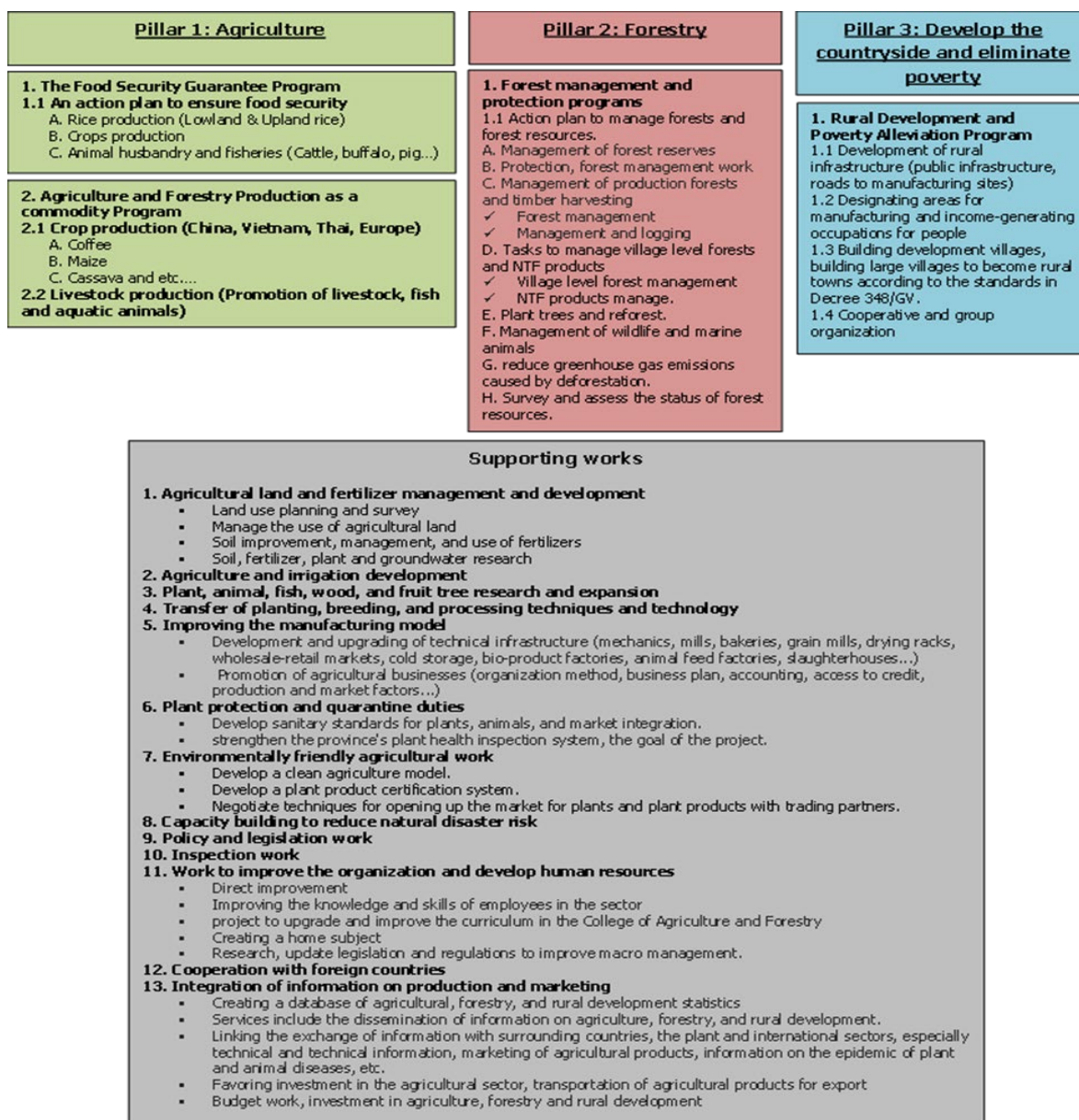


Figure 1: The 5 years agriculture, forestry and rural development plan (2021–2025)

The Houaphan province level

Based on the IX 5-year socio-economic development plan (2021-2025) of the Department of Planning and Investment in Huaphan Province, which directly and indirectly includes 2 major areas: 1) the economic area (agriculture and forestry) and 2) the service area (industry and trade).

Agriculture and forestry work is focused on 1) cultivation work, 2) raising animals, 3) irrigation, 4) inspection and forestry, and 5) rural development and poverty alleviation. The first priority for cultivation work is 1) rice cultivation (rainy and dry rice and upland rice). The rice cultivation area is 28,566.94 hectares; the food crop cultivation area is 7,276.35 ha; and the commercial crop cultivation area is 22,256.31 hectares. Animal husbandry aims to increase the number of livestock: 148,056 cows; 56,468 buffaloes; 1,463 horses; 168,466 pigs; 38,060 goats; and more than 2.47 million poultry and livestock for domestic consumption and export. There are 22,899 cattle, 5,282 buffalo, 16,101 goats and 65,597 pigs. Poultry (chickens, ducks): 3.88 million

In addition, rural development work and solving poverty are very important in helping all ten districts across the province become free from poverty, such as Son, Sop Bao, Xiengkho, and Viengxay district. Sob Bao and Xiengkho are the districts that have implemented the project's activities in the past.

The industrial and commercial activities related to agriculture are: 1) importing and exporting goods. In the next 5 years, Houaphan province is expected to have a total import value of 55.69 million US dollars and a total export value of 29.69 million US dollars. 2) registration and management of a business; 3) domestic trade work; and 5) product promotion and development work.

10.3.3 Development plans on ministerial, provincial and district levels-

Following is a summary of the main responsibilities for supporting agriculture and forestry activity based on the findings of the ToC meeting as reported by the industry and commercial office at the provincial level (Houaphanh) and the representatives from government sector employees in three districts (Sop Bao, Xienkho and Et).

The overall role of the industrial and commercial sectors concerning agriculture

1) Regional and international linkages

At the province level:

- ❖ Facilitate entrepreneurs who intend to request commercial privileges from the importing country by issuing a certificate of origin.
- ❖ Collaborate with the business sector to provide advice on trade barriers to resolve and propose them to the upper level for consideration
- ❖ Encourage and promote the creation of added value for goods; effectively promote the export of goods used for direct production.
- ❖ Provide access to the market with advantages. Industrial processing can contribute to the value of exports and can replace imports.
- ❖ Promote fair trade competition, fight against commercial monopolies, make business operations more equitable.

At the district level:

- ❖ Create export policies such as compiling various documents
- ❖ Facilitating the importation of production factors (seeds...), issuance of plant health certificates, issuance of tax payment certificates, and creating a strategic plan between the districts in the production of plants as a commodity

2) Create an environment with facilities for the economic sector

At the province level:

- ❖ Facilitate the filing of enterprise registration documents for business operators to make the notification of enterprise registration flexible, consistent, and appropriate according to the law.
- ❖ Monitor and manage the price of goods in the market to ensure peace and stability. Consumer goods and food prices
- ❖ Monitor trading outside the system.
- ❖ Manage and adjust small and medium factories according to their rights and roles.
- ❖ Promote small and medium-sized enterprises in accessing various sources of funds with ease and speed.

At the district level:

- ❖ Create a policy to attract businessmen and investors, especially by creating joint contracts between the government, businessmen, and farmers,
- ❖ There is an open policy in terms of trade, various services
- ❖ Create a joint contract with businessmen and farmers when collecting and purchasing, and issue a registration certificate for purchasing agricultural products.
- ❖ Open a meeting to learn lessons between businessmen and farmers.
- ❖ Publicize relevant documents and legislation for businessmen and entrepreneurs to be informed

3) Investment pattern

Typically, the Provincial Agriculture and Forestry Office (PAFO), the Provincial Industry and Commerce Office (PICO), and the Provincial Finance Office (POF) will be the three primary government organizations in Houaphanh Province that will be involved in investment planning for the forestry and agricultural industries, particularly to produce cash crops (such as lowland and upland rice, maize, vegetables, etc.).

According to the Planning and International Cooperation unit study under the auspices of PAFO, there are two primary categories of attracting investment from both domestic and international firms and traders:

Pattern 1: Investors /Traders do not yet have information on the area to invest (small number)

- After the company/investor/ trader has received the enterprise registration certificate from the PICO, the tax fee has been paid to POF and then coordinated with PAFO;
- PAFO will then require companies/investors/traders to coordinate with districts and target villages to survey the potential areas in such production areas.
- Upon completion of the survey, the company must prepare or write an economic and technical report of the project to be invested using the form from PAFO.

Pattern 2: Investors /Traders have more information on the area to invest (large number)

- After the company/investor/ trader has received the enterprise registration certificate from the PICO, the tax fee has been paid by POF and then coordinated with PAFO;
- Investors/traders liaise directly with target districts and villages to conduct surveys and collect data from the target areas of the project without going to PAFO.
- After that, an official letter was made and an economic-technical analysis was written to the PAFO for the implementation of the project.

- After receiving the official letter and an economic-technical analysis from DAFO, the PAFO coordinated with the relevant unit within the office to comment on and consider the project.
- After the inspection and consideration by the relevant unit under PAFO, the Planning and Cooperation unit (PAFO) will prepare the official letter to the PAFO for permission to conduct such a business/project.

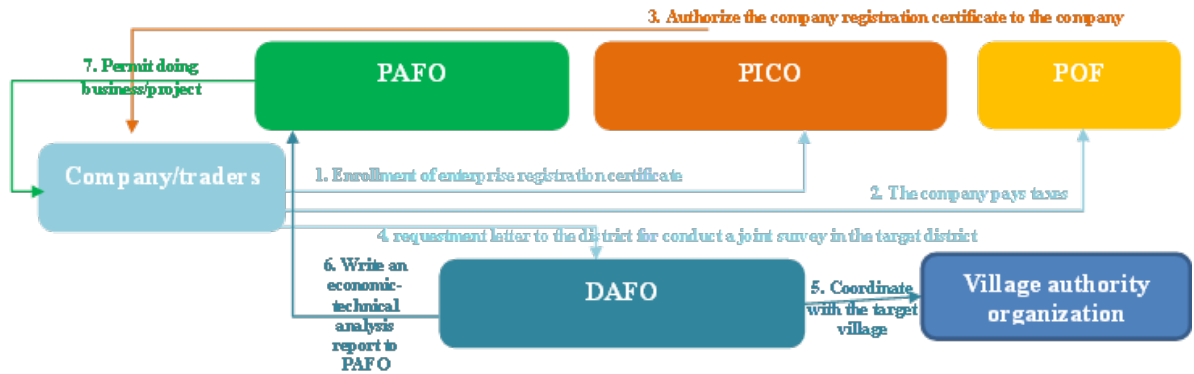


Figure 2: The provincial investment pattern 1

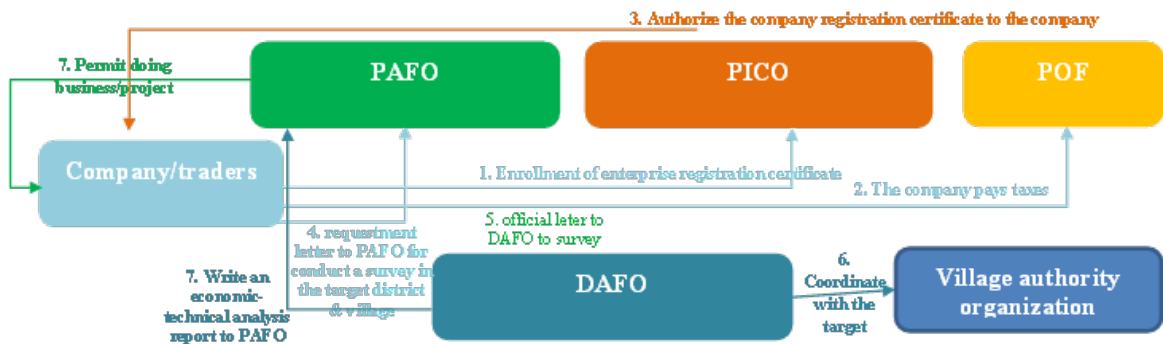


Figure 3: The provincial investment pattern 2

The Role of Houaphanh Province

1. The Food Security Program:

It is to determine the structure of agricultural production in terms of cultivation and animal husbandry, such as rice, food crops, commodity crops, livestock, and fish. In this plan, the most important priorities are: 1) Rice production: the total rice planting area is 28,566 ha; 2) food crops: producing food crops in an area of 7,276 ha; and 3) animal husbandry and fishing are mainly focused on raising cattle (by 2025, there will be 148,056 cows), buffaloes (by 2025, there will be 56,648 buffaloes), and pigs (by 2025, there will be 168,466 pigs).

2. Agriculture and Forestry Production Program:

Speeding up the organization of production as a cooperative. There is a policy to promote production and processing with the goal of increasing the value and quality of products; increasing access to credit; marketing; and transportation; as well as supporting measures to reduce the effects of disasters. At the same time, there are plans and measures to manage agricultural land development, research and experiments in agriculture, forestry, and rural development, as well as regular coordination with related departments, including: a) Planting as a commodity: This includes all 7 main crops and estimates that production by 2025 will be 22,556 ha throughout Houaphan province, which includes priority crops such as: 1) coffee, aiming to produce 567 ha of planting area by focusing on 4 districts, namely: Sam Tai, Kwan, Son, and Sam Nua districts; 2) maize for animals until 2025 to get 9,291 ha of planted area; and 3) cassava until 2025 to get 2,091 ha of planted area. There are also other plants such as jojoba, tea, and cardamom. b) Animal husbandry and fisheries: until 2025, the goal is to produce a variety of animals for domestic consumption and export, including 22,899 cows, 5,282 buffaloes, and 16,101 goats. c) Forestry and NTF products: 1,100 tons of NTF from various permitted species, as well as some bamboo

3. The managing and forest-protecting program:

PAFO is to continue managing and allocating forests and forest resources according to green and sustainable development by focusing on the management of national forest reserves, forest protection management, forest inspection, and forest resources.

4. Rural Development and Poverty Alleviation Program:

Continue to develop rural infrastructure and allocate land and jobs to people who do not have stable land and jobs. Improve living standards and get rid of poverty gradually. The province aims to achieve the target of 26 per cent of poor villages in 2025 within 10 districts, with the aim to declare four districts: Son, Sop Bao, Xiengkho, and Viengxay poverty-free districts. Development efforts also focus on developing rural infrastructure (public infrastructure, access roads to production areas) and organizing farmer groups and cooperatives.

5. Supporting works

5.1 Management and development of agricultural land and fertilizers: This is to speed up the delineation of specific production areas for planting rice, other broadacre crops, vegetable and fruit trees, and livestock and fish and determine the potential production areas of each locality. Carrying out participatory surveys and plans for the use of agricultural and forestry land at the village level, issuing agricultural land use certificates and agricultural

land development certificates, demonstrating and recommending straw ploughing to increase rice yield to 100 hectares (10 ha/district), and collecting 600 tons of manure, compost, and plant debris to nourish the soil in the dry and rainy seasons

5.2 Irrigation-agricultural development is increasing the capacity to supply irrigation water to agricultural production areas, and irrigation projects in the annual development plan from 2021 to 2025 have a total of 21 projects that will accelerate the rice cultivation focus areas of the province in 3 districts along the Namma River, namely: Sop Bao, Xiengkho and Et, and focus on small chicken rice cultivation in 2 districts, namely: Viengxay and Sam Nua.

5.3 Researching and expanding plant, animal, fish, and fruit tree varieties; Speeding up the improvement and maintenance of plant and animal varieties, as well as training farmers in planting and rearing techniques; and strengthening the province's personnel by providing technical training, organizing study tours, and sharing lessons with other parties.

5.4 Transferring planting, rearing, and processing technology techniques; determining appropriate, advanced, and modern techniques to disseminate and encourage units, families, farms, and farmer organizations to use them in the production and processing of crops, goods, animals, and fish.

5.5 Improving the production model It is accelerating the promotion of production as a product at the family level, moving up to a cooperative, farm, or network of specialized associations in relation to the services of two ends of domestic and foreign businesses with the development and upgrading of the technical infrastructure (mechanics, mills, bakeries, grain mills, drying racks, wholesale-retail markets, cold storage, fertilizer factories, feed mills, and slaughterhouses), and promoting and organizing agricultural business units (how to organize, business plan, accounting, access to credit, factors of production, and market).

5.6 Plant protection and quarantine work: updating and publishing various pieces of legislation, guidelines, and technical manuals to serve as a foundation for managing plant quarantine and import-export management.

5.7 Organic Agriculture: Accelerate the certification of clean agriculture production areas for producer groups and control the use of chemicals and pesticides.

5.8 Create the ability to reduce the risk of natural disasters by creating a management plan and reducing the risk of disasters in the agricultural sector at the district and village levels by having reserves of seeds, production factors, fertilizers, medicines, and others in case of droughts and floods, disease-insect outbreaks;

5.9 Policy and Legislation Create and update legislation below the law, including policies and strategies for the necessary and urgent sectors in order to link with the international and regional, as well as a focus on spreading and monitoring the implementation of agricultural and forestry development strategies.

5.10 Inspection work is mostly related to political work, encouraging and monitoring the thinking of civil servants and volunteers.

5.11 The work of improving organizations and developing human resources is focused on improving efficiency, upgrading the knowledge and skills of employees, and creating local skills.

5.12 Cooperation work focuses on implementing the management mechanism for international cooperation, as well as using aid for development, management, and inspection; targeted and highly effective assistance. It is also to determine the areas and allocate production areas related to solving the problem of land reservation that leads to the promotion of production in a wide range of economic cooperation between provinces and provinces, districts and districts according to the potential of each production area, and allocate production areas to the animals, especially the forest areas of each village.

5.13 Integration of production and marketing data accelerates the creation of a database of statistics on agricultural production, forestry and rural development, services, and dissemination of information, facilitating investment in agriculture, transportation of goods, and exports.

Table 1: The Agriculture, Forestry, and Rural Development Five-Years Plan IX (2021–2025) of PAFO

Pillar 1: Agriculture
1. The Food Security Guarantee Program
1.1 An action plan to ensure food security
A. Rice production: Total rice planting area: 28,566 ha, with an estimated yield 109,789 tons <ul style="list-style-type: none"> ▪ Dry season rice: area 1,876 ha, estimated yield 7,614 tons. ▪ Rainy season rice: area: 15,299 ha, estimated yield: 72,328 tons. ▪ Upland rice: reduce the farmland to 11,390 ha in 2025, with an estimated yield: 29,846 tons.
B. Crops production: total area of 7,276 ha; estimated yield 37,750 tons.
C. Animal husbandry and fisheries <ul style="list-style-type: none"> ▪ Cattle: By 2025=148,056 cattle. ▪ Buffalo: By 2025=56,648 buffalo. ▪ Pigs: By 2025=168,466 pigs.
2. Agriculture and Forestry Production as a commodity Program
2.1 Crop production (China, Vietnam, Thai, Europe)
A. Coffee: area = 567ha, Yield =2,536 tons
B. Maize: area= 9,291 ha, Yield =51,782 tons
C. Casava: area=2,091 ha; 16,129 tons
D. Job's tear: area =1,054ha, Yield=2,128tons
2.2 Livestock production (Promotion of livestock, fish and aquatic animals)
A. Cattle = 22,899
B. Buffalo = 5,282
C. Goat = 16,101
D. pig = 65,597
Pillar 2: Forestry
1. Forest management and protection programs
A. management of forest reserves
B. Protection, forest management work B. Protection, forest management
H. Survey and assess the status of forest resources.
Pillar 3: Develop the countryside and eliminate poverty
1. Rural Development and Poverty Alleviation Program
1.1 Development of rural infrastructure (public infrastructure, roads to manufacturing area)

1.4 Cooperative and group organization
Supporting works
1. Agricultural land and fertilizer management and development
2. Agriculture and irrigation development
<ul style="list-style-type: none"> ▪ The focus areas for rice cultivation in the province are defined as 3 districts (SB, XK and Et district) ▪ Focus areas for Kai noy rice
3. Plant, animal, fish, wood, and fruit tree research and expansion
<ul style="list-style-type: none"> ▪ Improve animal, plant, and fruit tree care. ▪ Produce baby fish ▪ Produce seedlings for fruit and tropical industrial timber. ▪ 3-5 trainings on planting and animal husbandry techniques for farmers
4. Transfer of planting, breeding, and processing techniques and technology
5. Improving the manufacturing model
<ul style="list-style-type: none"> ▪ Development and upgrading of technical infrastructure (mechanics, mills, bakeries, grain mills, drying racks, wholesale-retail markets, cold storage, bio-product factories, animal feed factories, slaughterhouses...) ▪ Promotion of agricultural businesses (organization method, business plan, accounting, access to credit, production and market factors...)
6. Plant protection and quarantine duties
7. Environmentally friendly agricultural work
8. Capacity building to reduce natural disaster risk
9. Policy and legislation work
<ul style="list-style-type: none"> ▪ 10. Inspection work
11. Work to improve the organization and develop human resources
<ul style="list-style-type: none"> ▪ Direct improvement ▪ Improving the knowledge and skills of employees in the sector
<ul style="list-style-type: none"> ▪ 12. Cooperation with foreign countries
13. Integration of information on production and marketing
<ul style="list-style-type: none"> ▪ Creating a database of agricultural, forestry, and rural development statistics ▪ Services include the dissemination of information on agriculture, forestry, and rural development. ▪ Favouring investment in the agricultural sector, transportation of agricultural products for export

Sop Bao District

Overview

Boundaries and Location

Sop Bao District is located along the Ma River, 82 km from Sam Nua. The district has a total area of 101,099 ha, borders 6 districts, has 75 villages, and has 4,362 families. There are 44 villages that have rice fields and roads to reach them and eight villages that have rice fields but no roads to reach them.

Special points and landscapes

Sop Bao District is a remote mountainous district with steep mountains. Travelling is difficult, and many locations is difficult to reach. Most of the people are settled along the roads and rivers in suitable places for production. The maximum temperature is 37 degrees, and the lowest is -4 degrees Celsius. There are two seasons: 1) the dry season, starting from November to April, and 2) the rainy season, starting from May to October.

Many rivers flow through, such as Nam Ma, Nam Hung, Nam Hao, Nam Hom, Nam Long, and other rivers suitable for supplying water to production areas such as rice fields, and that may be the source of hydroelectric power. There are beautiful mountains and forests, such as the Bambo Forest. There are abundant natural resources and fertile soil suitable for farming and animal husbandry, which are the basis for the livelihood of the people in Sob Bao District, which is getting better day by day, and having a border with Vietnam has made it easier to travel, exchange goods, and also become a transit service district.

Problems and conditions of villages and focus areas

Problems

The infrastructure system of the district has not been developed as it should be, and it is not enough to meet the requirements, such as the fact that, although there are roads to reach the villages, only 33 villages can be reached in both seasons and 34 villages can be reached only in the dry season. Education and public health are not yet universal, and the Highlands' production area is still limited. The use of technical techniques in production is still small. Some villages still believe in Confucianism, have a traditional narrow way of thinking and a dependence mentality.

The problems mentioned above have the effect of making the transportation of goods and communication between villages and cities difficult. Access to clean water systems, sanitation, and vaccination for various target groups has not been achieved according to the target.

Farming and animal husbandry production is also a natural, dispersed production, produced not for consumption within the family but as a commodity, and there is still no application of technical advances in production, resulting in low production efficiency and the implementation of some SDG goals are not achieved yet.

Condition for future development

The advantage of the district is that it is a transit district with a border with the Republic of Vietnam. The infrastructure system has been developed; there are roads

connecting to many cities within the province; the roads to the countryside have been developed; and there are roads to the production areas of the people in almost every village.

Within the district, there is a policy to promote and attract domestic and foreign private-sector involvement. There are economic activities in agriculture, livestock, trade services, silk-weaving, tourism, and others in which some villages and groups of villages have the main strength in socio-economic development with prominent characteristics as follows:

- Sop Bao and Meung Hung village group along Road 6A: Rice cultivation, trade services, large animal husbandry, fish farming, low-level handicrafts, khasan, and various non-permanent crops.
- Sop Bao and Meung Long village groups: rice cultivation, trade-service business, handicrafts, raising large and small animals and fruit trees, and growing various non-permanent crops.

Development of agriculture and forestry sectors

By 2024, there will be 6,598.84 hectares of cultivated land. Among them, rice planting in 2024 will have a total of 4,262.64 hectares planted with a yield of about 17,619.733 tons. The total area of crops other than rice in 2024 will be 2,336 hectares, yielding 47,702 tons of crops such as bananas, peanuts, watermelons, etc. By 2024, the district will have 13,968 cows; 6,932 buffaloes; 1,413 goats; 15,189 pigs; 112,254 poultry; and 5,431 kg of fish.

Encourage people to raise animals on farms, raise them in areas, and turn to other raising techniques. Simultaneously, train village veterinarians to cover all villages throughout the district and advertise and mobilize people to vaccinate their animals so that 85% of all animals are kept.

To achieve the general direction set according to the plan for developing agriculture, forestry, and rural development at the provincial level and the Ministry of Agriculture and Forestry (MAF). The SB district has a vision to "ensure food security; promote the production of agricultural products that are potential, profitable, clean, preserve the environment, and are produced sustainably; contribute to comprehensive rural development; and create the economic base of the city in the direction of industrialization and modernization."

The focus work plan has been determined according to the structure of programs and focuses tasks as follows:

Pillar 1: Agriculture

1.1 *The Food Security Program:*

The Food Security Program, including the Food Security Guarantee Plan as a whole, can be guaranteed on a basic food requirement, and the rest can be sold as goods, especially rice production, animal husbandry, and fisheries of each type as follows:

Rice production: The 5-year rice production plan (2020–2024) expects a total area of 20,241 ha (dry-season rice at 3,260 ha, rainy-season rice at 11,481 ha, and upland rice at 5,500 ha), with an estimated total yield of 77,088 tons.

Table 1: Total area and productivity estimates for rice production (rainy and dry season rice)

Years	Estimate the total area (ha)	Estimated productivity (tons)
2020	3,854	13,813
2021	3,854	14,021
2022	4,110	15,634
2023	4,160	16,349
2024	4,262	17,269

Crop production: focusing on upgrading and expanding production to reduce the import of things that we can produce ourselves, such as sweet corn, sweet potatoes, various types of vegetables, peanuts, ginger, garlic, chillies, cucumbers, eggplants, guavas, papayas, chickpeas, long-pod beans, tomatoes, and cucumbers. The 5-year plan 2020–2024 has a total area of 2,965 ha with an estimated yield of 7,630 tons.

Table 2: Estimate the total area and productivity for crop production

Years	Estimate the total area (ha)	Estimated productivity (tons)
2020	555	1,434
2021	560	1,448
2022	594	1,519
2023	610	1,570
2024	646	1,658

Animal husbandry and fishing production are accelerated for: 1) consumption; 2) veterinary medicine; and 3) the growth of the herd. The details are as follows:

- ❖ The consumption of meat, fish, and eggs in the 5-year plan (2020–2024) is 59 kg/person/year. In order to ensure safe consumption and cleanliness and meet the target, the district is focusing on promoting animal health and veterinary services to gradually improve the growth of livestock.
- ❖ Veterinary: Vaccinate animals (cows, buffaloes, goats, pigs, and poultry). The 5-year plan until 2024 is to vaccinate 151,800 animals.
- ❖ animal herd growth (according to national herd balancing technical standards), more details as follows:
 - ✓ Cattle: 5-year plan until 2024 to have 62,375 animals: 2020 expected 11,066 cows, 2021 expected 11,730 cows, 2022 expected 12,433 cows, 2023 expected 13,178 cows, 2024 expected 13,968 cows.
 - ✓ Buffalo's 5-year plan until 2024 is to have 33,329 animals: 6,405 in 2020, 6,533 in 2021, 6,663 in 2022, 6,793 in 2023, and 6,932 in 2024.
 - ✓ Pigs' five-year plans call for 67,301 animals: 10,751 in 2020, 13,120 in 2021, 13,776 in 2022, 14,465 in 2023, and 15,189 in 2024.
 - ✓ By 2024, goat 5-year-olds intend to have 6,545 animals: 1,209 in 2020, 1,257 in 2021, 1,307 in 2022, 1,359 in 2023, and 1,413 in 2024.
 - ✓ Poultry 5-year plan until 2024: 82,504 animals expected in 2020; 89,112 animals expected in 2021; 96,240 animals expected in 2022; 103,939 animals expected in 2023; and 112,254 animals expected in 2024.
 - ✓ Fish farming until 2024: 2020 expected fish release of 4,470 kg; 2021 expected fish release of 4,693 kg; 2022 expected fish release of 4,927 kg;

2023 expected fish release of 5,173 kg; 2024 expected fish release of 5,431 kg.

1.2. Agriculture and Forestry Production Program

a) *Commodities from agriculture and forestry production*

Agriculture crops produced as primary products include: fodder corn, melons, oranges, passion fruit, taro, and cassava, estimated to have a total area of 7,808 hectares with an estimated yield of 47,702 tons.

For general product production crops, including white sesame, mango, tamarind, soybean, longan, sugarcane, and lime, a total area of 580.5 hectares and an estimated yield of 1,162 tons.

Table 3: Estimates the main products according to the 5-year plan (2020-2024).

Years	Estimate the total area (ha)	Estimated productivity (tons)
2020	1,559	9,553
2021	1,561	9,554
2022	1,561	9,537
2023	1,563	9,547
2024	1,564	9,552

Table 4: Estimated for general products based on a 5-year plan (2020-2024).

Years	Estimate the total area (ha)	Estimated productivity (tons)
2020	123,7	227,3
2021	123,2	227,3
2022	105,2	230,8
2023	121,2	233,3
2024	126,2	243,3

b) *Commodities from Animal husbandry and fisheries production*

The Sob Bao district is focused on livestock production for export and sale outside the country, such as:

- Cattle export plan (five years plan): Export 163 cattle.
- Buffalo export plan (five years plan): to get 124 buffaloes.
- Goat export plan for 5 years to get 72 goats.
- Pig export plan for 5 years to get 545 pigs.
- Poultry (chickens, ducks) export 5-years plan to get 96,000 birds.

There is also an operational plan to support the two main programs mentioned above: the operation plans for managing and developing agricultural land. By determining the specific production areas for growing rice, plants, fruit trees, raising animals, raising fish, and determining the production potential of each locality, encourage and follow up on the census of agricultural land for 10 villages of 100 plots.

Pillar 2: Forestry

2.1 *Forest management and protection programs*

Upon determining the extent of the forest to protect and the forest coverage rate to be 75%, forest land to promote tree planting for tourism, create a forest to provide environmental

services to maintain water sources and land for the lower plains to be a rehabilitation area. Planting more to sell carbon credits means specifying the forest area, forest land, and water area land to be used, developed, and managed not to exceed the standard. Forest and resource inspection work, in general, is focused on suppressing wildfires, controlling weapons by removing stun guns and hunting weapons for 60% or more, and preventing theft of wood, forest products, and aquatic animals in the forest.

Pillar 3: Develop the countryside and eliminate poverty

3.1 Rural Development and Poverty Alleviation Program

Action Plan for Rural Development and Poverty Eradication is focused on solving poverty, especially improving the living conditions of people in rural areas. Sob Bao District is speeding up the action plan to prevent and solve the effects of the disaster. Change to a new production system that adapts to changing weather conditions, such as the rice planting calendar, how the plants will change and need to be adjusted in terms of varieties, must be new techniques and technologies, such as: change to machinery to reduce the time of soil preparation, planting, care, harvesting, warehouse system, and value-added processing.

In addition, for the organization of groups and cooperatives, it is to strengthen and have access to livestock and markets by continuing to encourage and monitor the establishment of crop-livestock production groups to six groups.

In addition to the three main pillars mentioned above, Sob Bao District also accelerates two projects that support the above programs, such as: 1) work to improve the organization and develop human resources; and 2) cooperation with foreign countries.

For the development of human resources, SB strive for employees to upgrade and expect the following:

- Master's degree: according to the plan until 2025, there will be 3 people. Currently, there are 0 people.
- Bachelor's degree: according to the plan until 2025, there will be 15 people. Currently, there are 10 people.
- Diploma: according to the plan until 2025, there will be 16 people; currently there are 15 people.
- Under diploma: According to the plan, by 2025, it will be reduced to 0 people. Currently, there is 1 person.

Gender roles in agriculture, forestry, and rural development. Pay attention to the implementation of gender roles at each level to follow the policy guidelines of the upper level. Strive for employees to receive training in specialized and diverse fields at least 2-4 times per year. Striving to contribute to the creation of 1-2 village-level agriculture and forestry developers per village.

Cooperation with foreign countries: paying attention to implementing the management mechanism of cooperation with foreign countries and using official aid for development strictly aimed at managing projects in the agriculture and forestry sectors in a centralized manner. Determining and allocating production areas (economy of scale) is related to resolving the dragging problem of land reservation, promoting production in a broad circle,

cooperation and economic relations between cities (Vietnamese Republic of Vietnam) in each area.

In order to follow the action plan above, the district has implemented measures such as:

Measures in implementation:

- 1) Continue to implement the ninth 5-years agriculture and forestry development plan until 2025 and the vision until 2030. First of all, it is speeding up the creation of an annual operation plan to determine the detailed development focus.
- 2) To transition into an organic market, pay close attention to establishing and structuring production groups, including farming, animal husbandry, and cooperative groups as well as service units or procurement service providers.
- 3) Increasing the effectiveness of promotion efforts in the improvement of planting-breeding for farmers, concentrating on the creation of a diverse variety of model families.
- 4) In order to share lessons learned with the model for improving the plan into a system fit for the actual environment of each locale, monitor and re-evaluate the outcomes of previous policy implementations.
- 5) Accelerate the area survey; gather data to identify the precise division of production areas, including agricultural production areas, conservation areas, each type of animal husbandry area, agricultural crop areas, and industrial crop areas to match the unique features and environmental conditions of each area.
- 6) Accelerate the cultivation of N-87 and N-97 rice since the Xieng Khor district has a small production area, with the goal of improving the quality of output to compete with the needs of the international market and the markets in neighboring nations.
- 7) Accelerate measures to deal with offenders of the Law on Forests, Water Animals, and Wild Animals and Order No. 15/MN strictly in accordance with the offender's case, including education, disciplinary measures, fines, anticriminal measures, and measures to increase punishment in accordance with each provision written in the law.

Xiengkho district

The Xiengkho (XK) District is another district that is similar to the other two districts in that it uses the strategic plans of the MAF and the province to evolve a strategic plan for the district in accordance with the conditions of the production area of the district itself. In general, the direction of the agricultural development plan of the district is focused on 3 pillars, 4 programs, and 10 operational plans. The details are as follows:

Overview

The agriculture and forestry sectors have continuously focused on the development of agriculture and forestry by developing an annual operational plan, achieving a good level of growth covering 68% of the district's GDP.

As a result, in order to achieve the objectives and the expected level, the Agriculture and Forestry Office has determined the action plan for agricultural and forestry development with focus, detailed measures, and a comprehensive support policy by identifying three

plans, four programs, and ten action plans of the Ministry of Agriculture and Forestry. Related to Plan VIII and the Strategic Plan for Agriculture and Forestry in accordance with the actual local conditions are as follows: three pillars (1. agriculture; 2. forestry; and 3. developing the countryside and eliminating poverty); four programs (1. the Food Security Guarantee Program; 2. agriculture and forestry production as a commodity program; 3. forest management and protection programs; and 4. the Rural Development and Poverty Alleviation Program); and 10 supporting works.

Details on the pillars and the program

Pillar 1: Agriculture

1. The Food Security Guarantee Program

1.1 An action plan to ensure food security

A. Rice production

In the five-year plan (2020–2024), 11,463.45 ha of the total area are planned (dry season paddy rice = 1,170 ha, rainy season paddy rice = 4,163.45 ha, and upland rice = 5,530 ha), with an estimated yield of 47,427.32 tons/ha.

Table 5: Estimated area and productivity for rice production

Years	Estimated the total area (ha)	Estimated productivity (tons)
2020	2,278.69	8,899.11
2021	2,378.69	9,526.47
2022	2,338.69	9,653.64
2023	2,268.69	9,787.45
2024	2,198.69	9,560.65

B. Crop production

There are 22 types of food crops: sweet corn, sweet potato, various types of potatoes, beans, cabbage, lettuce, onion, garlic, peanut, ginger-garlic, chilli, cucumber, eggplant, guava, papaya, green bean, long pod bean, tomato, cucumber, and watermelon. The 5-year plan 2020–2024 has a total area of 2,609 ha with an estimated yield of 17,890 tons.

Table 6: Expected area and yield for crop production

Years	Estimated the total area (ha)	Estimated productivity (tons)
2020	463	3,057.5
2021	476	3,253
2022	517	3,554
2023	555	3,849.5
2024	598	4,176.5

C. Livestock production

- The consumption of meat, fish, and eggs has increased to 50 kg per year per person and above. Based on the 5-year plan (2020–2024), it will be 46.76 kg/person/year by 2024. Currently, it can reach 44.25 kg/person/year. In order to guarantee consumption and cleanliness and meet the target, we focus on promoting animal health and veterinary services to gradually improve the growth of livestock.
- Veterinary: Vaccinate animals (cows, buffaloes, goats, pigs, horses, and poultry). The 5-year plan until 2024 is to vaccinate 271,070 animals: 2020 to

52,609; 2021 to 48,356; 2022 to 52,246; 2023 to 56,204; and 2024 to 61,655 animals.

- animal herd growth (according to national herd balancing technical standards).

Table 7: Expected number for livestock production

Species	2020	2021	2022	2023	2024
Cattle	12,125	12,489	12,863	13,249	13,647
Buffalo	3,302	3,335	3,368	3,402	3,436
Horse	138	145	152	160	168
Pig	15,850	16,642	17,474	18,348	19,265
Goat	3,083	3,237	3,400	3,568	3,747
Poultry	96,292	101,107	106,162	111,470	117,044
Fish	482,675	506,808	532,150	558,756	586,694

2. Agriculture and Forestry Production as a Commodity Program

The main commodity crops production

The main products of the district have been determined to be 15 types of crops to be produced and exported according to the 5-year plan (2020-2024) with a yield of 115,535.6 tons and divided into 2 categories: perennial crops and annual crops, as follows:

- There are 13 types of crops in the perennial-long-life crop category: Oranges, sweet plums, Job's tear, Mak Kao, coffee, bananas, mangoes, cassava, longan, cardamom, pears, sweet peaches, and taro. Production and export expanded to a total area of 1,551.74 hectares. The area that has already yielded fruit is 1,114 hectares. The expected total yield is 46,705.6 tons.

Table 8: Expected area and yield for the main commodity crop production

Years	Estimate the total area (ha)	Estimated Yield (tons)
2020	823	6,102.9
2021	989	7,545.8
2022	1,165	9,027.6
2023	1,353	10,984.6
2024	1,551	13,044.6

- There are two types of non-perennial crops: maize and watermelon. Production and export according to the 5-year plan: the expected total area is 11,387 ha, and the yield is 68,760 tons. For more details, see the table below:

Table 9: Expected area and yield for non perennial crops production

Years	Estimate the total area (ha)	Estimated Yield (tons)
2020	2,272	13,668
2021	2,275	13,710
2022	2,278	13,758
2023	2,280	13,800
2024	2,282	13,824

The general commercial crops production

There are 17 types of general commercial crops. The 5-years plan covers a total area of 1,406 ha with a yield of 11,433 tons and is divided into 3 types: leafy, fruit, and stem plants as follows:

- There are 3 types of leafy plants: tea, tobacco, and mulberry. for a total of five years in an area of 112 ha with a yield of 323 tons.
- There are 12 types of fruit crops in the district: soybeans, white sesame, cotton, pineapple, tamarind, jack fruit, peach, lemon, star fruit, coconut, star apple, and custard apple. In total, 5 years, the area is 849.8 ha and the yield is 5,400 tons.
- There are 2 types of plants for stems: black sugar cane and sugar cane. For a total of 5 years, the area is 445 ha, and the yield is 5,100,00 tons.
- Separate production of general commodity crops from 2020–2024 (17 species in total)

Table 10: Expected area and yield for general commocial crops production

Years	Estimate the total area (ha)	Estimated Yield (tons)
2020	280	2,213.75
2021	270	2,188.85
2022	279.5	2,267
2023	291	2,356
2024	286	2,407.5

Livestock production for export:

Most of the animal products for export are sent to Vietnam, and the district has a plan to produce and sell animals for export. The 5-year plan focuses on large animal species and a few small animals, as shown in the table below:

Table 11: Expected number for livestock production for export

Species	2020	2021	2022	2023	2024
Cattle	157	94	100	120	250
Buffalo	89	175	212	240	394
Pig	325	352	380	424	487
Goat	288	288	288	288	288
Poultry	5,230	5,430	5,595	5,670	5,770

In addition to the main programs, it also includes the action plan that supports two main programs:

Action plan for agricultural land management and development

- Continue to manage, protect, and develop the agricultural land of the district in an area of 9,741 hectares to ensure the production of food and products.

- Agricultural land use management activities: Continue surveying and surveying agricultural land throughout the district until 2024 to get 10 villages that can allocate agricultural land for people to manage and sustainably use for a long time.

Agricultural and Forestry Infrastructure Development Action Plan

- Continue to develop and improve the irrigation system throughout the district, with a total of 139 irrigation facilities.
- By 2024, there will be 36 permanent irrigation sites. to be able to irrigate 850 ha of rainy-season paddy rice and 350 ha of dry-season paddy rice.
- Encouraging farmers to expand and clear new lowland rice fields lying in the area. Further irrigation construction and repair projects are: the Huaisan-Ban Bao irrigation construction project (new construction worth 30.05 billion kip) is planned to be completed in 2021. The project to build an agricultural technical service station in the Ban PhiengSa cluster group is worth 1.67 billion kip. The construction plan will be completed in 2019.

Agricultural and forestry experimental research plan

Continue to promote and attract grant projects from international organizations to become partners in the development of agriculture and forestry, such as focusing on research, experimenting with planting trees for crops, and projects to improve the maize cultivation system. It is also sped up to: 1. expand the traditional banana (Saniong banana) to generate income for the families of Sob Koi village, with a target of 82 families; they planted 26.86 hectares of banana trees, with 10,172 trees planted, and harvested the produce for consumption and sale as regular products; 2. conserve and expand the natural forest tea as well as the protection of wild varieties in two villages, Kong Kham, Kak Xay, and Nong Kieng; and 3. manage and preserve the reserve.

Action plan for supplementary fertilizers and agricultural and forestry technical services

Continue to organize production groups in terms of cultivation groups (5 groups) and livestock groups (30 groups).

Pillar 2: Forestry

2.1 Forest management and protection programs

2.1.1 Forestry and Forest Resource Management Action Plan:

The district will continue to manage and protect forests in a total forest area of 47,164 hectares. By 2024, the rate of forest coverage in the whole district will be 51% (currently 47%); continue to implement and enforce Order No. 15/MT and other strict laws. By focusing on forest management and the timber business, we promote tree planting, manage village-level forests and NTF products, Inspect the forest, and manage forest resources.

Pillar 3: Develop the countryside and eliminate poverty

3.1 Rural Development and Poverty Alleviation Program

3.1.1 Rural Development

A. Development target

Continue to build the remaining 21 development villages until 2024 to get 13 more villages. Continue to monitor the focus on rural development and eradicating poverty related to the work being done, including the focus on allocating land and fixing occupations. The focus on developing small villages to become big villages and building large villages to become colorful small districts in the countryside is related to three tasks: building three villages according to the potential of each village.

B. Poverty

Poor villages in 2019 are expected to have 12 villages for every 190 families. The plan will continue to clear the poor villages in 5 years to get 8 more villages by 2024, bringing the total district to 4 villages with poor families totaling 50 families.

C. Focus on developing rural areas and eradicating poverty

Continue to follow up on the project to build an agricultural technical service center for Phieng Sa village with a total value of 1.667 million kip. Propose government investment projects in the agricultural sector to get three projects worth 3.667 million kip.

In addition, the district is focusing on the work of allocating land and permanent livelihood, creating a village development fund, the district's small livestock fund, and the district's development fund.

In order to achieve this plan, the district has the following measures to implement in the future:

8. Continue to implement the 8th 5-year development plan for agriculture and forestry until 2020, develop the strategic plan for agriculture and forestry until 2025, and develop the vision until 2030. Accelerate the creation of annual action plans to determine the detailed development focus.
9. Pay attention to creating and organizing production groups such as animal husbandry groups, cultivation groups, production cooperative groups, and service units or service providers to transform into an organic market.
10. Improve the efficiency of promotion work for farmers in the development of planting and rearing, with a focus on creating a diverse range of model families.
11. Monitor and re-evaluate the outcomes of previous policy implementations in order to share lessons learned with the model of improving the plan into a system appropriate for each locality's actual environment.
12. Accelerate the survey of the area; collect various information to determine the detailed division of production areas such as agricultural production areas, conservation areas, each type of animal husbandry area, agricultural crop areas, and industrial crop areas. suitable for special points and the natural conditions of each area.
13. Accelerate the cultivation of crops and rice (N 87, N 97) because Xieng Khor district has a limited production area, aiming to raise the quality of production to compete with the international market and the needs of the markets of surrounding countries.
14. Accelerate measures to deal with violators of the Law on Forests, Water Animals, and Wild Animals and Order No. 15/MT strictly according to the offender's case, such as

education, disciplinary measures, fines, criminal measures, and measures to increase punishment according to each article of the law.

10.3.4 Et district

Overview

Boundaries and locations

Et district is one of the 10 districts of Houaphan province, with a total area of 1,330 km². It is located at 104.49 longitude and 20.81 latitude, 324 meters above sea level, 132 kilometers away from the provincial municipality. It has borders with 5 districts: the north is adjacent to Songma District, Son La Province, Vietnam; the south is adjacent to Sam Nua District; the east is adjacent to Xiengkho District; and the west is adjacent to Son and Sobkob Districts, Son La Province, Vietnam.

Most of the people are settled along the roads and rivers in places suitable for production, such as rice fields, which may be the source of hydroelectric power in the future. There are beautiful mountains and forests, such as bamboo trees, and various animals. There are abundant natural resources, such as soil suitable for cultivation such as maize, soybeans, fruit trees, and animal husbandry, which are the basis for the livelihood of the people of the district and are gradually improving day by day. In addition, the Et district has a border with Vietnam, which has made it easy to come and go, to exchange goods, and to be a district that has entered into tourism and services.

Special points and landscapes

The Et district is characterized by a landscape of high mountains and slopes with little production area and low production efficiency. Most of the people live along the rivers, but from north to south there is little land for farming and animal husbandry, which is an obstacle to socio-economic development. It has a height of 324 meters above sea level. There are two seasons: the dry season from November to May with cold weather and the rainy season from June to October with hot and humid weather.

Problems and conditions of villages and focus areas

Problems

In the past, the infrastructure system of the district has not been developed as it should be and is not enough to meet the requirements, such as: although there are access roads to the villages, among them, there are 26 villages in the two seasons and 51 villages in the one season.

The education-health network is not yet universal, and the production area is still limited as it is a highland area. The use of technical techniques in production is low, the people of some villages still have confused beliefs, and there is still a traditional, narrow, and dependent mindset.

The aforementioned issues have an impact on goods transportation; traveling from village to village and between urban and rural areas is difficult; access to clean water systems, urinating; vaccinations for various target groups have not been achieved in accordance with the goals; the knowledge and skills of health center staff are still low; there is a lack of medical equipment; some villages are located far from the health center; and the village education and development committee is ineffective.

Conditions for future development

It is a district bordering Vietnam, and the infrastructure system has been developed with roads connecting to many districts within the province. Roads to rural areas have also been developed. There are model branches in agriculture, livestock, trade, services, silk-weaving, tourism, etc. Some villages have the most potential for socio-economic development because of the following characteristics:

- District area: trade, business, tourism, handicrafts, fruit trees, paddy cultivation, various vegetables;
- Meung Van area: cultivation of rice paddies, fruit trees, industrial trees, corn, various vegetables, raising large animals, raising fish in ponds, and handicrafts.
- Nakham area: upland and lowland rice cultivation, vegetable planting, raising fish in the pond, raising large animals, handicrafts, and tourism.
- Long hoi zone: rainy and dry paddy rice cultivation; fruit trees; melons; vegetables; raising large animals; and handicrafts.
- Na Phieng area: handicrafts, rice cultivation, animal husbandry, corn cultivation, fruit trees
- Meung Xum area: planting rice, coffee, MaK nod, and cardamom; raising animals; raising fish in ponds; and making forest products.
- Nam Kuong area: rainy and dry paddy rice cultivation, corn, animal husbandry, handicrafts, etc.
- Chiang Khun area: rainy and dry paddy rice cultivation, fruit trees, various vegetables, melons, an industrial forest, corn, fish farming, handicrafts, animal husbandry, and industrial plants.
- Na Kai area: rainy and dry paddy rice cultivation, fruit trees, industrial trees, handicrafts, corn, fish farming, and raising large animals.
- Dan village area: cultivation of rice paddies, fruit trees, industrial trees, raising fish in small craft ponds, producing mattresses, pillows, and sofas; animal husbandry; industrial trees; watermelons; corn; and various vegetables.
- Ban Na area: rainy and dry paddy rice cultivation, fruit trees, raising large animals, corn,
- Meung Sum area: focus on raising large animals, raising fish, and planting fruit trees.

The direction for the socio-economic development plan (2020-2024) at the district level

The vision of the district is to develop the city to become an agricultural production city and a commodity related to services and tourism. by accelerating the district's main potential for socioeconomic development: 1) agricultural potential; 2) animal husbandry potential; 3) border trade; and 4) services-tourism. In addition, five programs and 69 development focus projects were identified, such as: 1. a program to develop agriculture and animal husbandry; and 2. program for product development; and 3. Development of services and tourism; 4. infrastructure and facility construction program, and 5. strengthening in relation to the three tasks of the program.

Development of agriculture and forestry sectors

The Et district has the vision and potential to develop the district into an agricultural production district to become a product related to services and tourism. The main way forward in the socio-economic development of the district is to speed up: potential 1: agriculture; potential 2: livestock; potential 3: commercial; and potential 4: tourism at the district level (District Planning and Investment Office, 2021).

Agriculture: Trying to restore the new farmland to 460 hectares from the current 1,099 hectares to 1,559 hectares. There will be a total of 26,102 hectares of cultivated land to harvest a total of 139,823 tons of produce, which includes 12,455 hectares of rice planting area and a total yield of 50,925 tons in this: a total of 5,495 hectares of rainy paddy fields yielded a total yield of 25,826 tons with an average yield of 4.7 tons per hectare; a total of 2,860 hectares of dry rice paddy fields yielded a total of 14,014 tons with an average yield of 4.9 tons per hectare. And there are 4,100 hectares of upland rice plantations with a total yield of 10,250 tons and 13,647 hectares of various crops with a total yield of 88,898 tons, including 2,830 hectares of food crops with a total yield of 11,603 tons. The area required to grow the main crops for 5,000 hectares and harvest 25,000 tons is: 5,000 hectares of corn and harvesting 25,000 tons. They cultivated 2,607 hectares of common crops, yielding a total of 13,632 tons. Of these, 561 hectares of fruit trees produced 8,785 tons, of which 227 hectares of mango produced 5,575 tons. It grew to 334 hectares of longan, yielding 3,210 tons, and issued a land census of 23 villages.

Livestock: Accelerate the raising of cattle, buffalo, goats, pigs, poultry, and fish, totaling 11,021 cattle, 7,035 buffalo, 1,924 goats, 22 horses, 17,171 pigs, and 60,140 poultry; release approximately 2,062,431 fish in the pond, yielding a total of 170 tons; vaccinate against cow-buffalo disease with 125,025 needles; and remove the cow-buffalo nail. Cholera produced 54,737 needles. Fowl cholera had 1,418,566 needles and provided 6,271 vaccines against various animal diseases.

Irrigation: A total of 63 irrigation projects are expected by 2024. Among them, there are 40 permanent irrigation systems to provide 500 hectares of land; 20 tree plantings to provide 129 hectares of rice land; 1 reservoir system to provide 15 hectares of rice land; and 2 water pumps to provide 31 hectares of rice land. The remaining 6 irrigation projects provide 103.5 hectares of rice fields and continue to install and repair 18 irrigation projects.

Forestry and inspection: It is expected that there will be an import and export of various forest products into the district of around 120 tons, and they will also collect 1,200 kg of seeds, plant 60,000 seedlings, and plant trees in 55 hectares. Land use planning and divide the land into 10 villages.

Rural development and poverty alleviation work: By 2024, build 10 more developed villages, covering 12.98% of all villages; create 371 more families to develop, accounting for 7.60% of all families. There are 53 poor villages, accounting for 68.83% of the total number of villages, and 1,174 poor households, accounting for 24.18%.

From the results of the ToC meeting and based on the strategic plan of MAF for the agricultural development plan of the Et district, it can be summarized as the Agriculture and Forestry Development Plan for 2022–2024, according to three main pillars, four programs, and 13 support tasks as below:

Pillar 1: Agriculture

1.1 The goal of the food security program is to accelerate agriculture or crops mainly by: 1) raising the productivity of rainy and dry season rice as the first and second priorities; and 2) planting vegetables as the third priority, and more in detail as below:

Rice production

It is expected to produce 12,455 ha of rice with a yield of 50,925 tons, including dry and rainy season paddy rice.

- Rainy season paddy rice improves productivity in 29 villages with a total area of 5,495 ha, an expected yield of around 25,826 tons, and a total expected budget of around 1,450 million Lak.
- Dry-season paddy rice improves productivity in 27 villages with an expected total area of 2,860 ha, a yield of 14,014 tons, and a total budget of 1,350 million Lak.
- Upland rice: expected total area is 4,100 ha, with an expected yield of 10,250 tons.

Crop production: focusing on vegetable production in 77 villages with a total area of around 2,837 ha, an expected total budget of 770 million LAK, and an expected yield of 11,608 tons.

Livestock production: It is promoting poultry egg breeding and accelerating local pig, fish, and poultry raising (duck and chicken). Local pig farming in 77 villages, totaling 11,113 pig's Local poultry production (duck and chicken) in 77 villages with an expected number of 631,000 head. Fish production is in five villages, with a total output of about 25 tons, and poultry egg breeding is promoted in only one village, with a total production of around 20,000 heads.

1.2 Agriculture and Forestry Production as a commodity Program:

The Et district focuses on growing feed maize as a top priority in 42 target villages with a total area of 4,500 ha; cassava cultivation in 43 villages with a total area of 4,500 ha is the second priority; and mango cultivation in 17 villages in an area of 330 ha is the third priority. And also, there are various activities that the district wants to do. The details of each activity or project under this program are shown below.

Crop production:

- Maize production is expected to cover approximately 5,000 ha across 42 villages, with a total yield of 25,000 tons.
- Cassava production with an expected total area of 4,500 ha in 43 villages
- Mango production with a total area of 330 ha and an expected yield of 5,575 tons in 17 villages.
- Long-term production in 17 villages covering 350 ha with an expected yield of 3,210 tons.
- Coffee is grown in eight villages covering a total area of about 25 ha.

Livestock production:

- Promote livestock production (cattle, buffalo, and goats) in 15 villages, including 11,021 cattle, 7,035 buffaloes, and 1,924 goats.
- Promote the cultivation of mulberry in 5 villages with a total area of 5 ha.

Pillar 2: Forestry

2.1 Forest management and protection programs

The second pillar of the 2.1 program, the forest protection management plan, includes a total of seven activities or projects, including three that are top priorities: 1) register property and issue title deeds; 2) establish a system for monitoring the implementation of forest law and land use planning; and 3) support capacity development and implementation to improve land use planning, monitoring, and enforcement. Details of each activity or project are shown below.

- Implement the land registration process and issue land titles in 15 villages.
- Develop a system for monitoring the implementation of forest laws and land use planning in 77 villages.
- Support capacity development and implementation in 10 villages to improve land use planning, monitoring, and enforcement.
- Develop the capacity and organize training for government employees on participatory land use planning (PLUP) for 10 villages.
- capacity building and training for government employees to assist with land registration and the issuance of land titles to five people.
- Develop the capacity to manage and prevent wildfires for government employees and residents of 10 villages.
- Implementation of the village forest management allocation plan in five villages

Pillar 3: Develop the countryside and eliminate poverty

For the pillar 3 in plan 3.1 of the rural development and poverty alleviation program, this plan includes all 4 main activities: 1) to build a development village according to Decree 348; 2) Develop the village focus of Meung Seum village to become a small and colorful village and 3) Form agricultural production groups. The details are as follows:

- Build villages developed according to Decree 348 by 2024, there are ten villages recover from poor village, 619 families recover from poor family, developed village in three villages and with develop family in the total number of 371 families
- Focus on developing Meung Seum village to become a colorful small town in the area.
- Create five distinct agricultural production groups, including two livestock groups.
- Provide advance budget support for the construction of an irrigation system and the expansion of ten new lowland rice fields.

In order to be able to follow the road map mentioned above, the Et district has implemented measures such as:

1. increase in protection and repair of existing infrastructure among government sectors, business entities, village level authorities, as well as ethnic groups. Within the Et district, they must be responsible for the creation and development of offices, business units, and villages. They must be strong in terms of organization and technology. At the same time, offices, shops, community-public areas, and villages must be orderly and clean.

2. The offices within the district and the village administration must pay attention to integration, strengthening, and transformation of the fifth 5-year socio-economic development plan. The resolution of the general meeting of the party committee and the policy guidelines of the party are issued as a detailed plan and project, as well as increasing the responsibility and ownership in the implementation to make it a reality.
3. focusing on mobilizing and raising funds from the public sector; seeking assistance from the friendship districts (Song Ma and Sob Kok District) in Vietnam and various international organizations to develop the economy and society of the Et District; and creating the necessary infrastructure, special policies, and a good environment to favor and attract domestic and foreign private sector investment more than before.
4. Improvement of the coordination mechanism and division of management between the province and the district according to the three directions: be absent, be clear and convenient, and explore and create new revenue bases more than before. Raising awareness of the role of politics, the role model of employees (civil servants), fighting against crime and various scandals that occur in the financial sector, implementing measures against violators, disciplinary measures against offenders, and strict financial regulations
5. The banking service units within the district must be responsible for providing credit to meet the goals of the city's socio-economic development plan in each period. This is to accelerate the cultivation and raising of people and the investment projects of the business units according to the potential of the district.
6. To be efficient and highly effective, the government sectors must be responsible for implementing their roles and for the management of state investment projects in accordance with the law. To ensure three interests—the general interests of the people, the interests of the government, and the interests of business entities—at the same time, the village administration must increase its responsibility to a higher level, and the people of the ethnic groups within the district must increase their self-reliance and build their own strength in building and developing their families.
7. Continue to implement the Sustainable Development Goals (SDGs) goals that have not yet been achieved as expected to be completely completed, especially some goals related to poverty reduction in the development of education and public health.

10.3.3 Consultation with businessmen and traders (Lao and Vietnamese traders)

The results of the discussion between representatives of business operators and traders, both Laotian and Vietnamese, at the ToC meetings showed that the main problem in trading along the Lao-Vietnamese border, especially the maize trading between the two countries, as a whole, the basic structure, especially the routes that export goods along the border, is not standard, and the transportation of goods back and forth is difficult. Currently, production factors have high prices, especially maize varieties and fertilizers, and most farmers import these factors from Vietnam.

Difficult access to capital makes it difficult for businessmen or traders who want to expand their businesses to be bigger because there is no place to lend money to expand their activities. For the sake of the conflict between traders and farmers, most of the maize selling price in the contract is a fixed price. Sometimes the farmers produce maize that is not of the quality agreed upon in the contract. In addition, some farmers steal maize and sell it to other traders who offer higher prices than the traders they contract with. Details of the main problems, conflicts, and requests are shown in the table below:

Table 12: Summarize the main problems, conflicts, and requests from the trader

Main problems		Conflicts		Requests from traders
Trading along the Lao-Vietnam border	Maize trading	Trader and Farmer	Contract farming on Maize	
Transportation is challenging, and the roads are bad for exporting products. It is difficult to access villages. The border closure during COVID still has residual negative effects.	<p>1) Poor roads, a distance from the market, high input (fuel costs), and inflation</p> <p>2) Poor quality maize, such as picking it while it is still raw and not retaining moisture, causes the maize to rot.</p> <p>3) The cost of growing is considerable since expensive seeds and fertilizers are used.</p> <p>4) Accessing capital is difficult when expanding a business.</p> <p>5) It is still not possible to build a maize drying</p>	<p>1) The fixed prices in the contract and the untimely collection often result in pests destroying the yield and causing losses.</p> <p>2) Some farmers steal maize and sell it to other traders who offer greater and more enticing rates, breaking the agreements made in the contracts.</p>	<p>Most farmers create two types of sales contracts. The first type is a monopoly contract, where the trader will set the price of the product himself, and the second type is a contract based on the market price..</p>	<p>1) The producing areas' access road needs to be repaired, so stakeholders are being asked to contribute money.</p> <p>2) appealing for money to develop a facility that dry maize and separate seeds from cobs and expand commercial operations.</p> <p>3) requesting that important participants in the maize trade make it easier to issue different documents, such as those for export, tax collection, and taxes, in</p>

	<p>facilities to added value to the product, and prevent spoilage due to high moisture.</p> <p>6) Farmers produce less corn and do not harvest corn at the same time due to high production costs (fertilizers, seeds, fuel, pesticides).</p>			<p>compliance with the law, and to control the price of goods so that it remains stable.</p>
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10.3.4 Consultation with village authorities and farmers

The ToC meetings with village authority and farmer representatives provided similar feedback. Most of the time, representatives from both sides wanted to focus on two main activities: agriculture, which primarily involves maize and fruit tree plantations, and livestock production, which involves raising large animals such as cattle and buffaloes.

In addition, in order to meet the needs of the farmers mentioned above, there are many convenience factors, difficulties, and suggestions, and the details of each are shown in the table below:

Table 13: Result of ToC workshop of village authorities and farmers' representatives

Activity	Priority	Convenience	Difficulty	Requestment	
Agriculture	Maize	1	There are some companies that are interested in investing in crop planting and market support.	Far from production areas, insect pests, and low prices	Farmers want the relevant sector to re-examine the contract with the company in the village.
	Orange	2	Suitable areas and flat land, with market support	Maintenance and crop planting techniques	Farmers want the experts to introduce the technique of applying fertilizer and to provide care and maintenance; they also want the experts to be trained in pruning.
	Mango	3	easy to grow and easy to care for. There are a lot of land areas.	There are no crop planting techniques supporting	Training on pruning

	Chili	4	Suitable area	Not enough water	
	cucumber	5	suitable area	Not enough water	
	watermelon	6	suitable area	There are no crop planting techniques supporting	
	longan	7	This crop can be grown easily on flat land.	There are no crop planting techniques supporting	Training on pruning
Livestock	Cattle-Buffalo	1	There is a suitable area and enough grass to eat.	Diseases that occurred in animals. There is no technique supporting animal management and production.	Farmers want government officials to take the lead in vaccinations and introduce breeding techniques and other links to animal care.
	Pig	2	There is a feeding area.	lack of resources and techniques supporting	Training on livestock production
Trade	trade		A village near the Lao-Vietnam border is closed during COVID-19.	Bad road and hard to travel	It needs the relevant sectors to repair or build the road and find markets.

10.4 Appendix 4: Analysis of strategies, development plans, policies, laws and legislations supporting agricultural development

10.4.1 Introduction

Analysis of policies, laws, and legislation is considered an important task in the implementation of the national agenda, according to the IX 5-year agriculture, forestry, and rural development plan (2021–2025) to create a new turning point for the transformation of the economic structure from traditional agricultural production to a modern agricultural-industrial production structure with quality, balance, and sustainability. The Ministry of Agriculture and Forestry has seen the need to review and research, define strategies and policies, and implement programs for agricultural production and forest management by identifying four programs: 1) food security and nutrition; 2) agricultural production; 3) forest protection and management; and 4) rural development and poverty alleviation.

After review, it was found that the Ministry of Agriculture and Forestry passed a total of 199 strategies, development plans, policies, laws and legislations, of which only 85 documents support agroecology (AE) and safe food system (SFS) Table 1.

Table 14: Documents related to agriculture, especially AE and SFS

Document type	Total document number	Total document number support AE and SFS
1. Strategy	31	12
2. Development plan	23	14
3. Policy	48	20
4. Law	24	12
5. Legislation under the law	73	27
Total	199	85

Source: DOPC and DALaM report, 2022

10.4.2 Strategy

In general, in the Huaphan Province (PAFO), it is based on the strategy of agricultural development until 2025 and the vision of 2030 of the MAF, No. 023, dated May 2022, to be based on and developed as a 5-year agriculture and forestry development plan (2021–2025) at the provincial and district levels. The results of the analysis of 12 strategic documents, on the basis of 10 elements related to the support of agricultural activities, especially AE and SFS, show that the strategy is the overall direction, which strategies will focus on diversity, which covers 92%, followed by human and social values (83%), and 75% synergies. In addition, it is also seen that efficiency, resilience, recycling, and responsible government account for 67%, but it is interesting that the strategy does not focus on the importance of co-creation and sharing of knowledge, culture, and food traditions, or the circular and solidarity economies, which account for only 50% and 42%, respectively (Figure

1). Report on policy analysis to support the agricultural ecosystem and food security in the Lao PDR (Department of Planning and Development and DALaM, 2022)

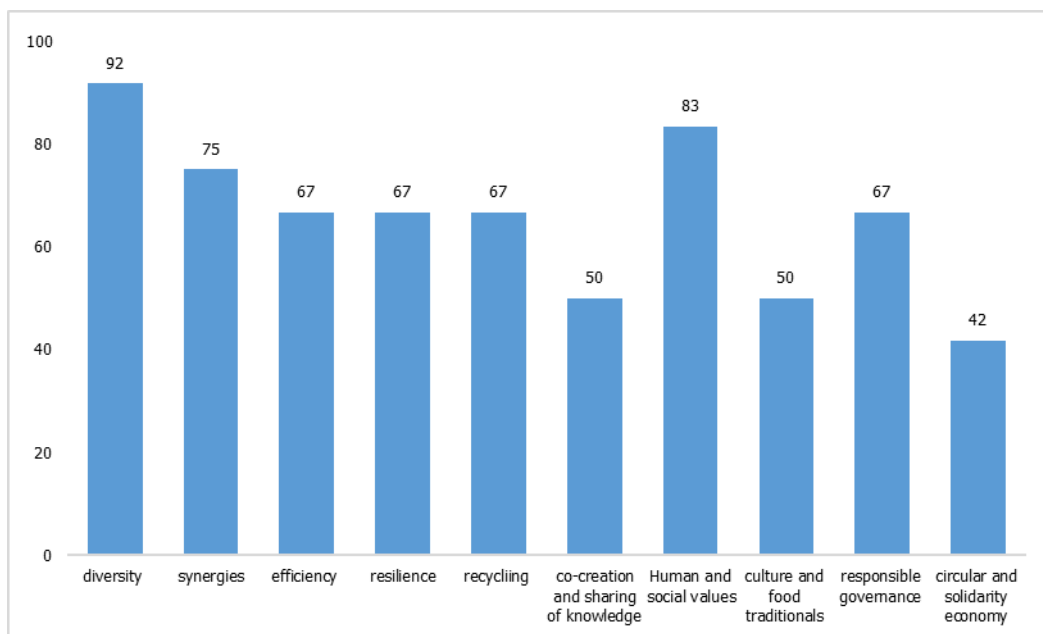


Figure 1: Strategies that support Agroecosystems (AE)

From the analysis of the strategy, a total of 12 versions at the central/government level will focus on production, consumption, and health, covering 58%, followed by processing at 33% and transport aggregation storage at 25%, but it is noteworthy that the strategy will not mention the distribution component (Figure 2). (Report on policy analysis to support the agricultural ecosystem and food security in the Lao PDR, Department of Planning and Development and DALaM, 2022).

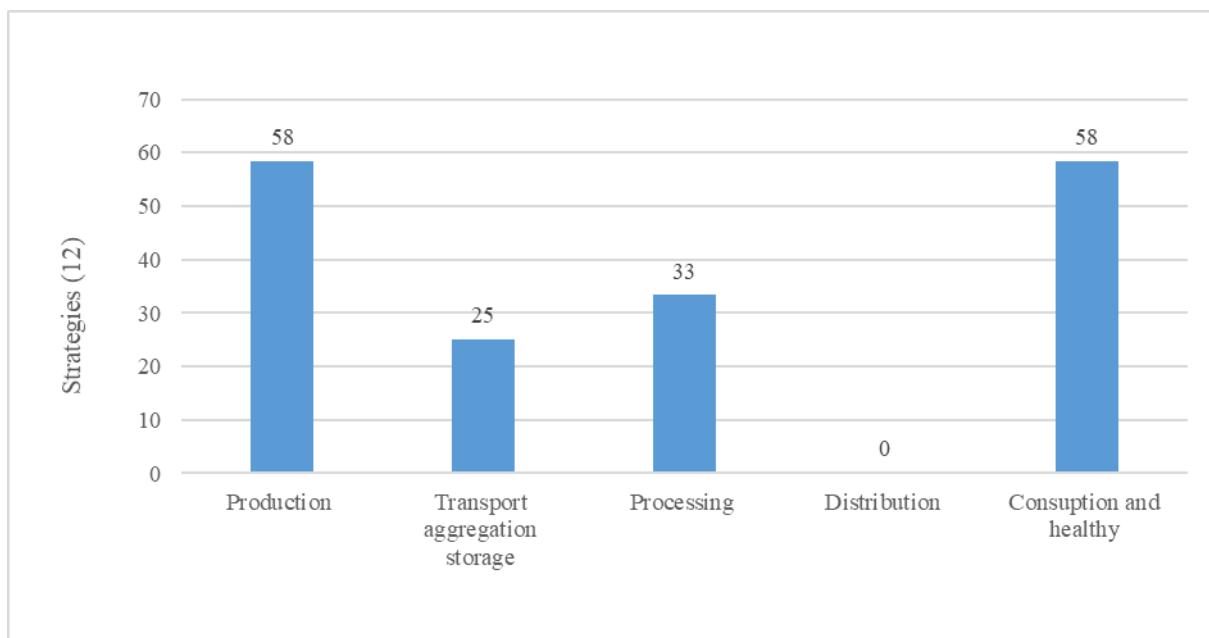


Figure 2: Strategies that support Safety food Systems (SFS)

10.4.3 Development and action plan

The results of the analysis of 14 development plans at the ministry/central government level that provide support for agriculture and forestry activities, especially AE, have the most support with three main elements: synergy, human and social values, and responsible

governance, which accounted for 93% of the total, followed by diversity and a circular and solidarity economy (86%), resilience and co-creation and sharing of knowledge (79%), and efficiency (71%). In addition, culture and food traditions were at 64% and recycling at 21%, respectively (Figure 3).

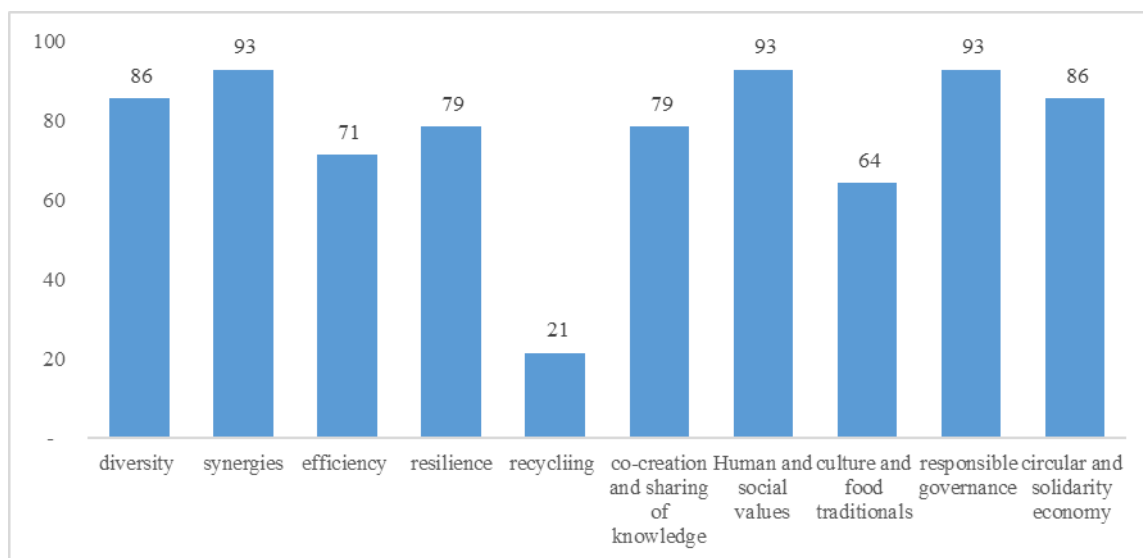


Figure 3: Results of the development plan review

10.4.4 Policies that support agriculture and agroecosystem

Overall, many policies support agriculture at the central level, but at the provincial level, it can be seen that the number of policies that support agriculture is small, which causes the development of the agricultural sector to be delayed and not supported by various parties, especially the government sector.

The results of the policy analysis of 20 issues that support agricultural work, especially the agro-ecological system, are diversity, covering 90%, followed by efficiency, co-creation and sharing of knowledge, 70%, a responsible government, 65%; synergies, 60%, human and social values, covering 55%, and circular and solidarity economics, culture and food traditions, and resilience recycling, which cover 50%, 45%, 40%, and 30%, respectively, as shown in Figure 4.

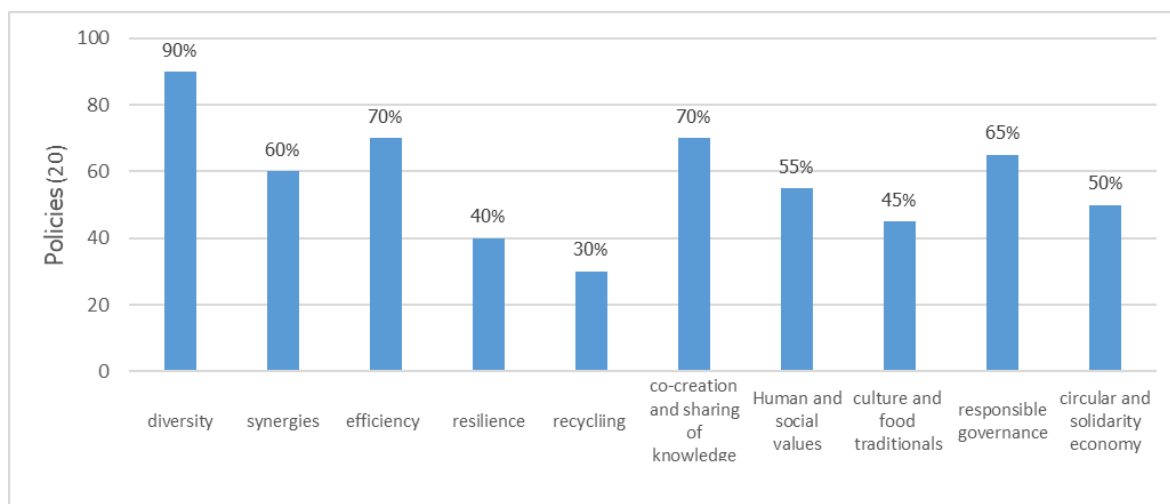


Figure 4: Results of a review of policies that support agroecosystems

10.4.5 Policies that support safe food systems

The results of the policy analysis of 20 issues, which support food safety the most, are production, covering 50%, followed by consumption and health at 40%, storage in transportation and processing at 30%, and distribution at only 25%, as shown in Figure 5.

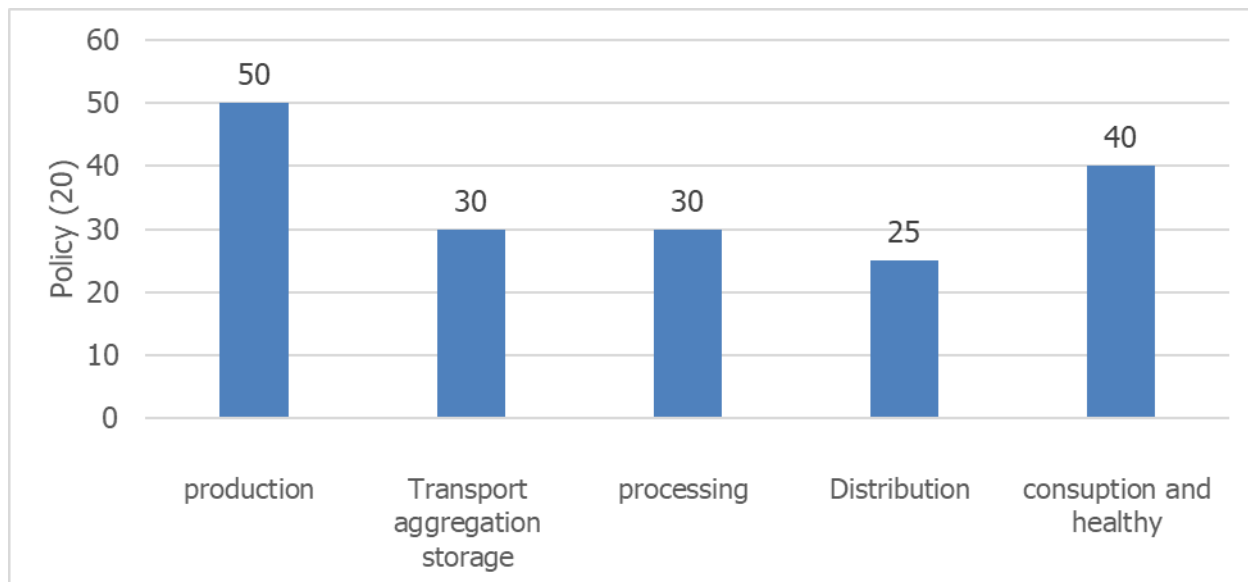


Figure 5: Results of a review of policies that support a safe food system

10.4.6 3.4.1 Laws that support Agroecosystems (AE)

The results of the analysis of the 12 legal documents that provide the most support for the agricultural ecosystem are responsible administration-governance, accounting for 92%, followed by resilience (75%), synergies and co-creation and sharing of knowledge for 67%, and efficiency (58%). In addition, it is noted that human and social diversity, culture and food traditions, and the circular and solidarity economy account for 42%, 33%, and 25%, respectively. But recycling is not supported in the work area of the express law, as in Figure 6.

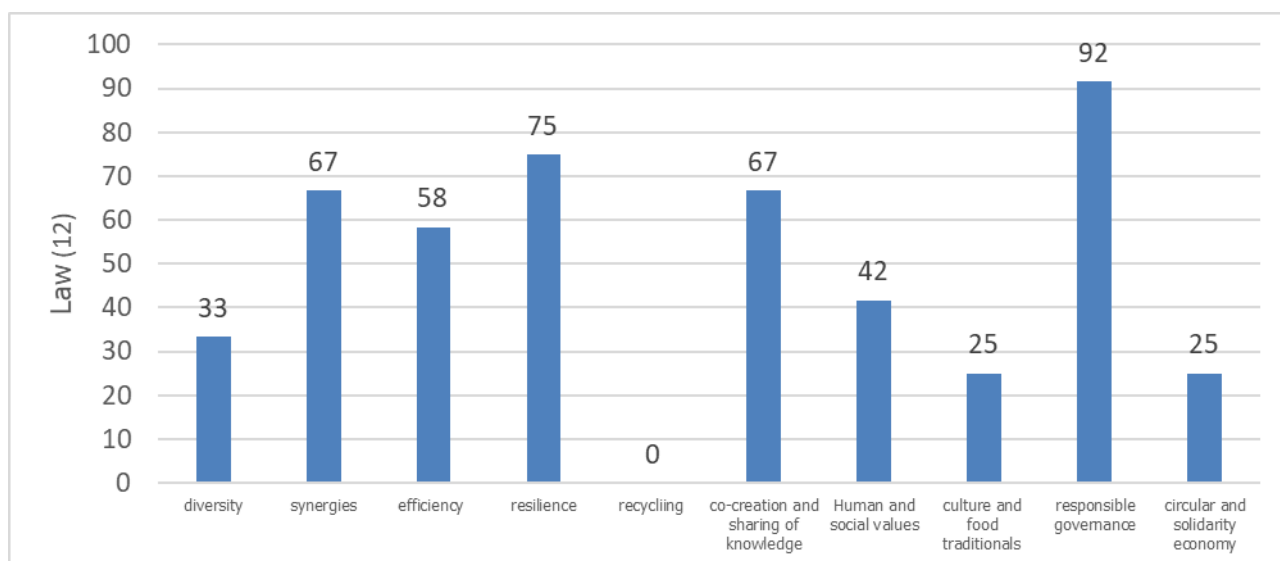


Figure 6 Results of a review of laws supporting agroecosystems

10.4.7 Laws that support safe food systems

The results of the analysis of the 12 legal documents that support the safety of the food system the most are processing, covering 58%, followed by production, 50%, storage and transportation, 33%. In addition, consumption, health, and distribution are covered by only 25% and 17%, respectively, as shown in Figure 7.

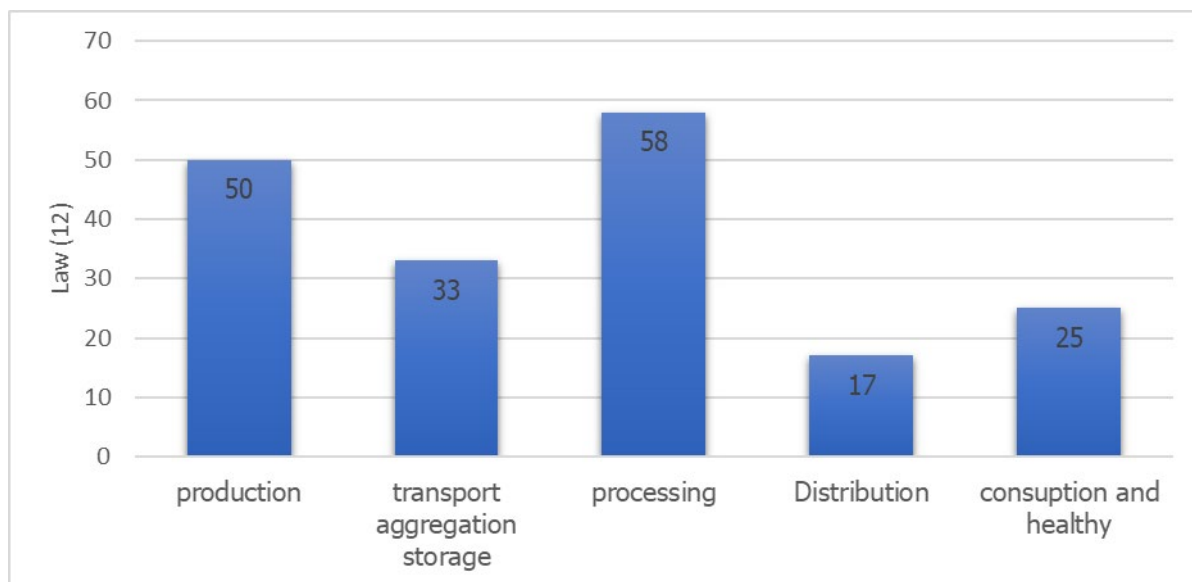


Figure 7: Results of a review of laws supporting a safe food system

10.4.8 Legislation that supports agroecosystems

The results of the analysis of 27 legal documents, which are information about decrees, orders, agreements, and recommendations that support the agricultural ecosystem the most, are synergies, covering 52% of the total, followed by responsible administration and governance (41%), co-creation and sharing of knowledge (33%), human and social values, and a circular and solidarity economy (26%). In addition, diversity, efficiency, recycling, and resilience accounted for only 15%, 11%, 7%, and 4%, respectively. As for culture and food traditions, there is no support in the field of legislation under the law, as shown in Figure 8.

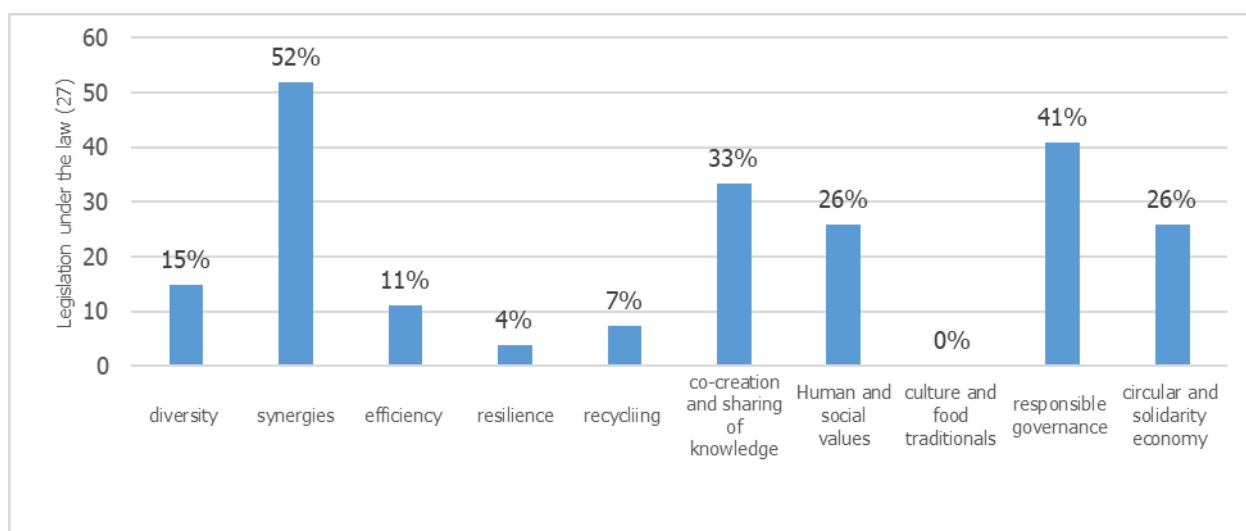


Figure 8: Results of review legislation under the law supporting AE

10.4.9 Legislation that supports a safe food system

The results of the analysis of 27 legal documents, which are information about decrees, orders, agreements, and recommendations, show that the activity that supports food safety the most is production, covering 41%, followed by storage and transportation at 30%, processing, consumption, and health at 15%, and that distribution is the least supported by only 7%, as shown in Figure 9.

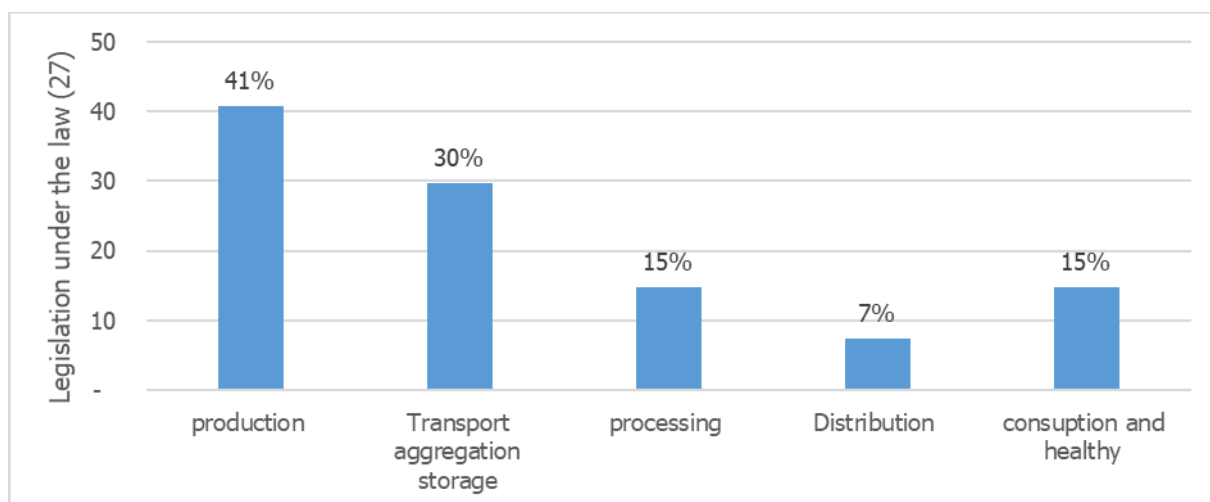


Figure 9: Results of a review of legislation under the law supporting SFS

10.4.10 Conclusion

According to an analysis of policies in the Lao PDR that support agriculture and forestry, particularly agroecology and food security, the development plan accounts for 93% of the total, followed by strategy (92%), policy (86%), Legislation, and Legislation under the law (67% and 52%, respectively).

If compared to the 5 components of food safety, it should be noted that it is still the development plan that provides support for food safety, which accounts for 86%, followed by strategy, which accounts for 58%, policy and legislation, 50%, and finally, in terms of legislation under the law, it is only 30%.

Overall, the 5-year agriculture and forestry development plan (2021-2025) at the provincial and district levels is based on the Ministry of Agriculture and Forestry's strategic plan, which focuses on 1) the food security program to accelerate the production of rice, food crops, and animal husbandry and fisheries; 2) the agricultural and forestry production program focuses on crop cultivation as a commodity; animal husbandry and fisheries; and 3) forest products as a commodity.

The relevant sectors should develop operational plans based on the 5-year agriculture and forestry development plan (2021-2025), creating a detailed project plan over a period of 1 year with a focus on being effective, dividing responsibilities and management levels clearly by clearly defining the duties of each part, defining production and research areas, improving the necessary policies to facilitate entrepreneurs and businessmen, both domestic and foreign, to invest in potential areas appropriately in order to stimulate and support the production plan as a commodity to follow the strategy of the agricultural sector, coordinating with related parties such as industry-trade, public works and transportation, planning and investment, etc., and coordinating with related parties such as industry-trade, public works and transportation, etc. In order to make the overall development of the organization go in the same direction and as a condition to facilitate the promotion of

agricultural production, strict monitoring, inspection, and evaluation are required to evaluate the strengths and weaknesses, outstanding issues, and solutions to make the implementation of the work more effective.

All of this is an analysis to support the design of different approaches for agricultural work, especially the transformation of the agricultural production system and the guarantee of nutritious food and clean and safe products. This will facilitate the decisions of policymakers, operators, entrepreneurs, manufacturers, and other related parties in different circumstances at each level and help develop policies that support agriculture, agricultural ecosystems, and food security in the Lao PDR to become a story that describes the Theory of change that leads to the production of a sustainable agricultural ecosystem and a safe food system.

In addition, it is seen that the various policies are not yet able to be implemented as well as they should be in terms of actual implementation at the local level regarding providing knowledge and understanding of strategic documents, development plans, policies, laws, and legislation under various laws.

10.4.11 References

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