



Agroecology and  
Safe Food System  
Transitions

# SCOPING STUDY REPORT

Potential of Dien Bien Province as flagship site for  
agroecology and safe food system transitions in  
Vietnam

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## 1. Introduction

The Agroecology and Safe food System Transitions (ASSET) project is a five-year regional project funded by the *Agence Française de Développement* (AFD), the European Union (EU), and the *Fond Français pour l'Environnement Mondial* (FFEM). The overall objective of the project is to harness the potential of agroecology to transform food and agricultural systems into more sustainable systems, notably safer, more equitable and inclusive, in Southeast Asia (SEA). The project intervenes in four countries (Cambodia, Laos, Myanmar, and Vietnam).

The project is structured in two operational components and six sub-components (Figure 1).

Flagship sites are pilot administratively managed territories where efforts and resources are concentrated to support and document agroecological and safe food system transitions. They are seen as key instruments of the sub-component 2.1 “Knowledge production and support to innovations”.

ASSET project will support innovations and knowledge production in four flagship sites, one per country. Fourteen potential flagship sites have been pre-identified during project feasibility, with four potential sites in Cambodia and Laos respectively, three potential sites in Myanmar and Vietnam respectively (Figure 2).

The present report describes the potential of Dien Bien Province as flagship site for agroecology and safe food system transitions in Vietnam.

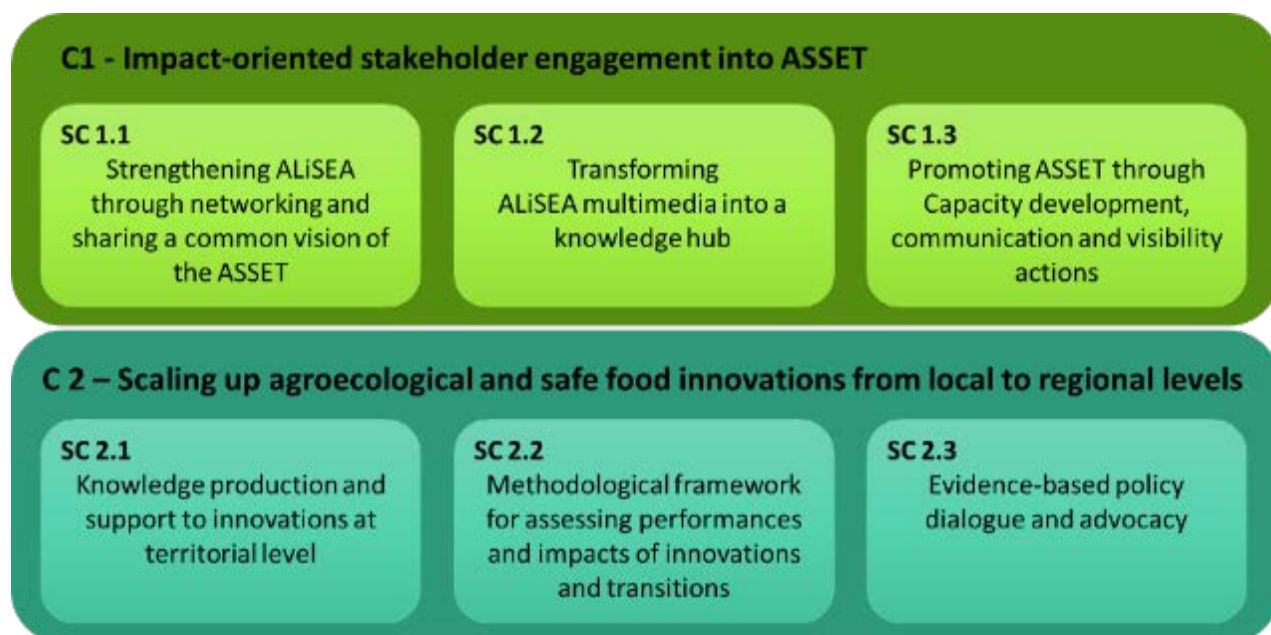


Figure 1. Asset project structure



Figure 2. Potential flagship sites in the four targeted countries

## 2. Scoping study process

### 2.1 Scoping study methodology

Scoping study in Dien Bien Province followed a 5-step process:

- **Step 1: Data preliminary collection and field studies preparation (Aug 2020 – Jan 2021)**
  - Preliminary list of projects and actors established using online platforms e.g. ALiSEA online library, CIRAD Open library, ACIAR website, Google and Google scholar etc.
  - Preliminary list of projects and actors completed during a participatory workshop organized in Hanoi on 11 November 2020 to map the initiatives and actors related to agro-ecology and safe food systems in the different pre-identified sites (14 participants)
  - 15 projects and initiatives pre-listed (Annex 1) and mapped (Figure 3)
  - 21 online interviews conducted with project managers and key informants to get additional information and documents about pre-identified projects (Annex 2)
  - 6 projects described using common description forms template (Annexes 3 to 8)
- **Step 2: Field study (1 – 4 March 2021)**
  - Meetings and field visits organized in three sites: Dien Bien Phu city, Dien Bien and Tuan Giao districts, where most of the projects were identified (Figure 3).
  - 44 stakeholders met: 23 public institutions, 8 cooperatives, 7 companies, and 6 projects (Annex 9)
  - Notes from interviews and field visits are presented in Annexes 10 to 33
- **Step 3: Restitution to Dien Bien Province (27 March 2021)**
  - Scoping studies preliminary results and identified knowledge gaps were presented to Dien Bien Department of Agriculture and Rural Development (DARD), Agriculture Extension Service Center (AESC), and Crop Production and Plant Protection (CPPP) Department
- **Step 4: Restitution at the occasion of the Vietnam consultation workshop (31 March 2021)**
  - Scoping studies preliminary results incorporating feed backs and adds-on from Dien Bien Province officials were presented to the 38 participants of the consultation workshop
- **Step 5: Data analysis and reporting (Nov 2020 – May 2021)**
  - Several loops of data analysis and consolidation incorporating feedbacks from participants of the consultation workshop
  - Final scoring and note attribution to the site

### 2.2 Scoping study team

- 1 French Msc student (Clémence de Villiers, ISTOM) involved in data preliminary collection
- 10 experts from 6 institutions (Table 1) involved in field study, data analysis and reporting

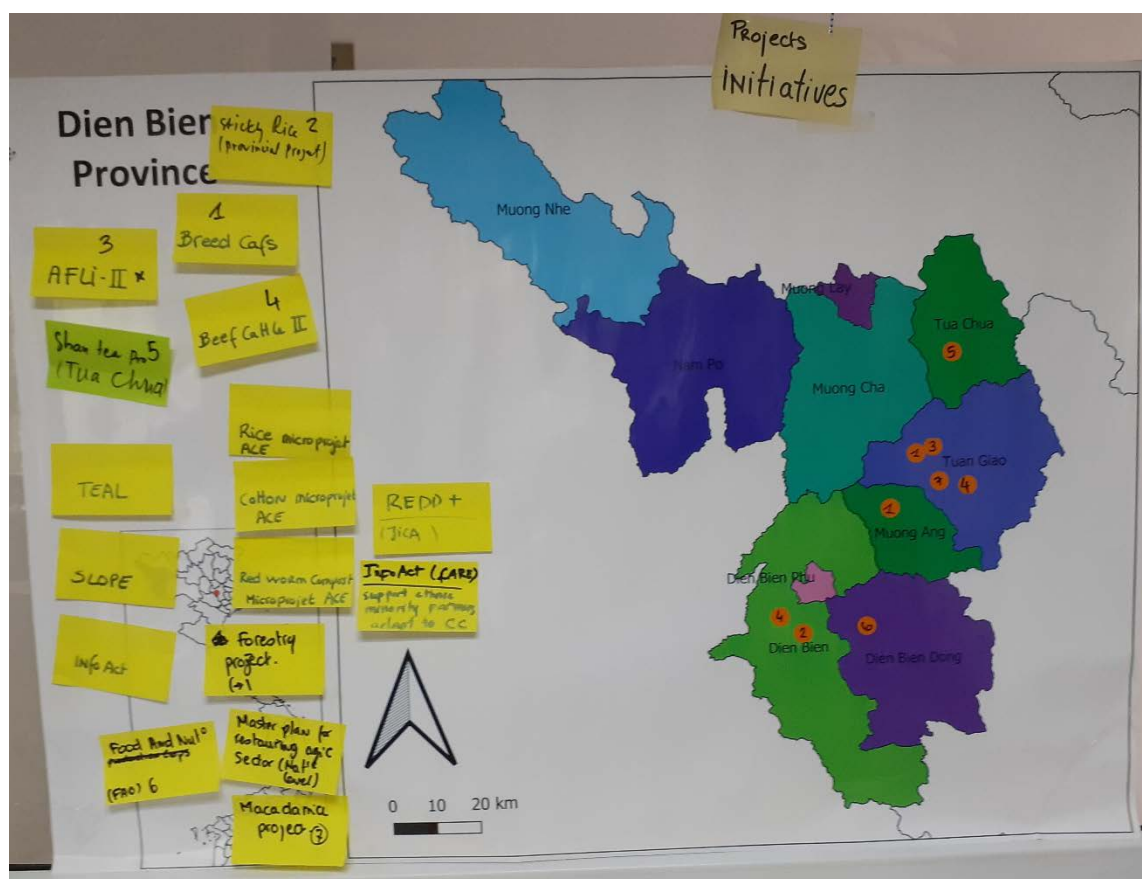


Figure 3. Participatory mapping of main identified projects in Dien Bien Province

Table 1. List of experts who participated to field study in Dien Bien Province

N°	Full Name	Profile	Organization
1	Mrs Le Thi Thanh Huyen	Animal scientist	NIAS
2	Mr Hàn Anh Tuấn	Animal scientist	NIAS
3	Mr Trong Hieu Do	Agronomist	NOMAFSI
4	Mr Le Khai Hoan	Agronomist	NOMAFSI
5	Mr Pham Cong Nghiep	Socio-economist	CASRAD
6	Mr Hoang Minh Huy	Policy specialist	IPSARD
7	Mrs Nguyen Ngoc Mai	GIS specialist	AGI
8	Mrs Estelle Bienabe	Economist	CIRAD
9	Mr Pascal Lienhard	Agronomist	CIRAD
10	Mrs Mélanie Blanchard	Animal scientist	CIRAD



### 3. Site brief description

Table 2. Dien Bien Province at a glance

<b>Total area (km<sup>2</sup>)</b>	9,500
<b>Forest area (ha)</b>	400,000 (42%)
<b>Agriculture area (ha)</b>	360,000 (38%), 96% rainfed, 80% steep slope
<b>Population (millions hab.)</b>	0.6
<b>Main ethnic group</b>	Thai (39%), Hmong (35%) 19 groups in total
<b>Population density (hab/km<sup>2</sup>)</b>	63
<b>Rural population (%)</b>	86
<b>Poverty rate (%)</b>	40
<b>Main economic sector</b>	Agriculture
<b>Main cultivated crop</b>	Paddy rice (29,000 ha) Upland rice (23,000 ha) Maize (28,000 ha)
<b>Main farmers sources of income</b>	Maize, fruits, vegetable Pigs, poultry

#### 3.1 Location

Dien Bien Province is located in the northwest mountainous region of Vietnam (Figure 4). The name "Điện Biên" means "stable border" in reference to the position of the Province in the extreme northwest of the country. This is a recent Province created in 2004 from a separation of Lai Châu Province into two provinces. The Province is difficult to access with about 12 hours drive from Hanoi up to Dien Bien city. An airport allows to fly daily from Hanoi to Dien Bien.

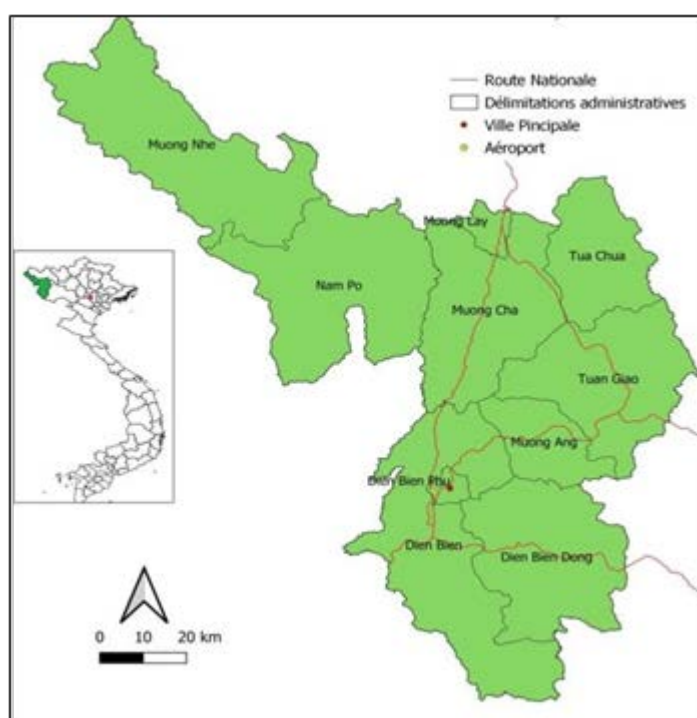


Figure 4. Dien Bien Province location map

### 3.2 Biophysical characteristics

The Province is characteristic of north-western mountainous regions, with mountains and plateaus covering 70% of the province, from 100 to 2200m asl (Figure 5).

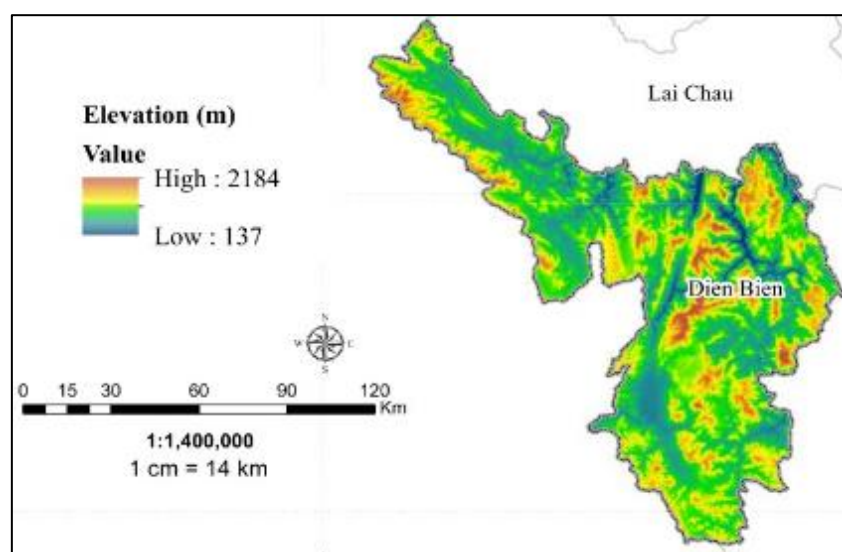


Figure 5. Dien Bien Province topographic map (Nguyen et al., 2020)

Dien Bien Province covers a total area of 9,500 km<sup>2</sup> including 42% of forest land and 38% of agricultural land (about 360,000 ha; GSO, 2019), a large part of this agricultural land (about 260,000 ha) being yet not attributed for land use (Figure 6, hatched parts on the map). Travelling within the Province is still difficult (many remote districts). Climate in Dien Bien is both tropical and mountainous with two distinct seasons: a rainy and hot season from April to September (with temperature of 27.4°C in May), and a dry and cool season from October to March (with temperature of 17°C in January and frequent frost events due to freezing winds). Total mean annual precipitation varies from 1,500 to 1,900 mm/year. Rainfall is mostly concentrated from April to September.

This climate allows the cultivation of both tropical and temperate crops (e.g. temperate fruits).

### 3.3 Population characteristics

Dien Bien Province has a total of 0.6 million inhabitants. Mean population density is 63 Person/km<sup>2</sup> (GSO, 2020). The majority of the population (86%) lives in rural areas. There are 19 different ethnic groups in Dien Bien province, with a majority of Thai people (39%), H'mong (35%), and Kinh (20%; GSO Dien Bien, 2019).

### 3.4 Socio-economic data

Province GDP was of 19,500 billions VND in 2019 (GSO Dien Bien, 2020), for an average income per capita of about 1.6 Million VND.

Dien Bien is the poorest Province in Vietnam even if poverty rates are decreasing (33% in 2020, 40% in 2019; GSO, 2020). Infant mortality rate is high (32.5 ‰; 50 ‰ for kids <5 years; GSO, 2020).

Cash crop cultivation depends on market access but also elevation (Figure 7). Globally, rice, maize, and in a lesser extend rubber and coffee are the main cash crops (Table 4). Pigs and buffalo are also important sources of income for households (Blanchard *et al.*, 2018).



Figure 6. Dien Bien Province land use map (Dien bien office, 2012)

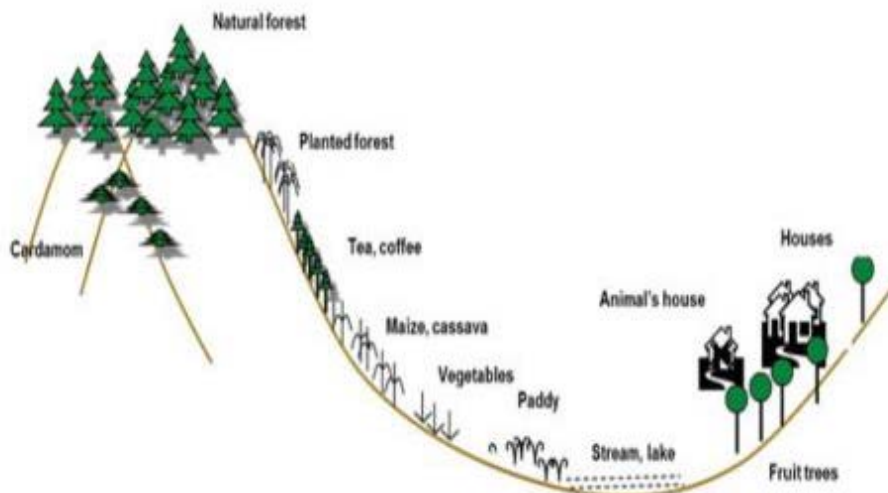


Figure 7. Crop distribution according to elevation (stall et al., 2014)

### 3.5 Main past-recent transformations

#### Cropping systems: paddy rice as farmers favourite agricultural investment; early changes regarding fruit and industrial crops sector development

No aggregated data were found before 2015, certainly due to the administrative restructuring of Lai Chau Province into Lai Chau and Dien Bien Provinces in 2014. No dramatic change in agricultural land use and production can be observed during this past recent (2015-2020) period, except for soybean whose cultivation dropped from about 5,000 ha in 2015 down to 200 ha in 2020 (Figure 8). Decreasing prices and the lack of suitable soybean varieties/cycles (local varieties are short-cycle varieties harvested while the rainy season is not over, leading to fungal attacks, grain losses and/or poor grain quality) are the main factors given to explain this trend. Paddy rice increased both in surface and production, confirming paddy rice as farmers' favourite agricultural investment where possible. Upland rice area increased from 18,100 ha in 2005 to 23,700 ha in 2012.

Figures regarding fruit cultivated area are contradictory according sources: Dien Bien DARD reports about 5,000 ha of fruits in 2020, while Dien Bien statistical office only mentions 1,820 ha (Table 3). However, fruits production has been increasing strongly during the past 6 years (+80%) due to the combination of increased cultivated area and increased production maturity of fruit tree plantations. Fruits are expected by the local authorities to play an increasing role in farmers' income generation in the coming years even if at the moment low prices (e.g. Son Tra –Hmong apple not being harvested because of low price 2,000 VND/kg) seem to hinder this expected impact.

The status of rubber plantations (5,000 ha in 2020) is still unclear (notably the share between private land/private farm and smallholders plantation) but the trees planted in the early 2010's have reached maturity stage. Tapping has started in 2017 with production increasing steadily to reach 3,000 tons in 2020 (Table 4). Similarly, Macadamia plantations (3,000 ha in 2020), are still mostly at immature stage. First harvest occurred in 2020. Macadamia planted area is expected to increase in the coming years with Macadamia playing an increasing role in local economy. Coffee cultivated area has been slightly decreasing during the past years (from 4,000 ha in 2015 down to 3,300 ha in 2020, Figure 8). Low current prices (in 2019, farm gate prices were of 2,000 VND/kg of cherry, the price of labour cost for harvest; some farmers removed coffee to cultivate upland rice in 2020) and coffee variety (Catimor) sensitivity to drought (coffee production varied from about 8,000 tons in 2017 to less than 3,500 tons in 2020, Table 4), explain the decrease in coffee cultivated area.

Besides paddy rice, upland rice, maize and cassava are the other main cultivated crops with no major change in cultivated area production over the past recent years (Table 4 and Figure 8). There is no data on vegetable production, despite an increasing number of farmers, and farmers organizations (cooperative) engaging into this sector.

#### Livestock systems: Pigs, between local needs and epidemic disease threats, and the steady growth of large ruminant population

Pigs are the main source of meat produced and consumed in Dien Bien Province (Table 5). The number of raised pigs is currently insufficient to meet local demand with the Province importing pigs from the Red River delta (Duteurtre *et al.*, 2016). Since 2015, the Province is partnering with CP company to develop pig production. However, African Swine Fever (ASF) is a major threat for pig production, with ASF epidemic event that occurred in 2019 and impacted pig stocking rate (Figure 9). With more than 135,000 heads in 2020, buffalos are the main large ruminants in the Province (Figure 9). Dien Bien Province is the second Province in North West Vietnam regarding buffalo population. The province has the objective to develop buffalo raising as there is a strong demand from Chinese market, limited disease on buffalo, and provincial wish to develop buffalo-related tourism (buffalo ride, horns, skin, dry meat etc.).

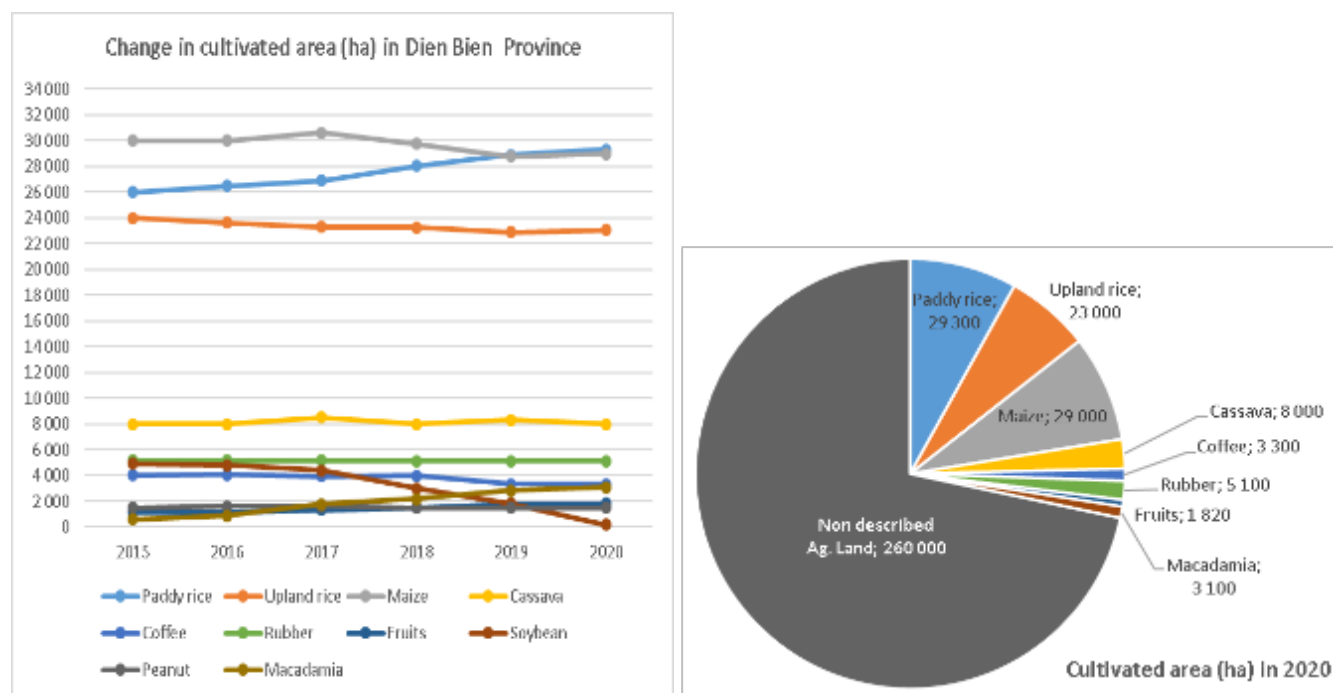


Figure 8. Change in crop cultivated area in Dien Bien Province (GSO Dien Bien, 2021)

NB: Tea (600 ha), Forage grass (780 ha) and vegetable production area (nd) are not represented

Table 3. Change in fruit cultivated area in Dien Bien Province (GSO Dien Bien, 2020)

Ha/Year	2016	2017	2018	2019	2020
Mango	343	347	372	447	448
Pineapple	110	214	301	318	358
Longan	293	303	305	322	326
Pomelo	80	96	148	290	306
Orange	213	201	204	226	226
Litchi	118	126	125	124	126
Jack fruit	20	20	21	29	30
<b>Total</b>	<b>1 177</b>	<b>1 308</b>	<b>1 476</b>	<b>1 756</b>	<b>1 820</b>

Table 4. Change in main crop production in Dien Bien Province (GSO Dien Bien, 2020)

Tons/year	2016	2017	2018	2019	2020
Paddy rice	140 946	144 181	150 970	156 904	159 503
Upland rice	34 475	33 935	34 380	30 121	31 718
Maize	78 514	80 090	79 251	78 211	79 299
Cassava	nd	nd	nd	nd	64 000
Fruits	4 950	6 455	7 299	8 301	8 808
Coffee	3 760	7 965	3 273	4 547	3 350
Rubber		443	1 167	2 138	3 077

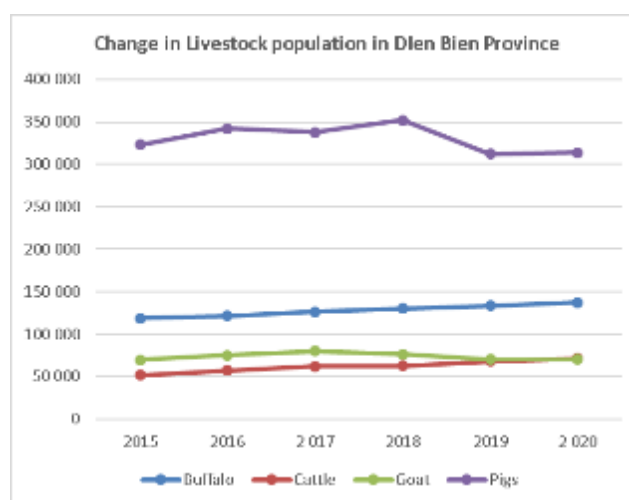


Figure 9. Change in livestock populations in Dien Bien Province (GSO Dien Bien, 2020)

Table 5. Live-weight meat production in 2019 in Dien Bien Province (GSO DB, 2020)

Livestock	Heads (Nb)	Living weight (tons)
Buffalo	137 391	2 600
Cattle	71 469	2 000
Goat	70 388	660
Pigs	314 000	12 400
Poultry	4 500 000	4 400

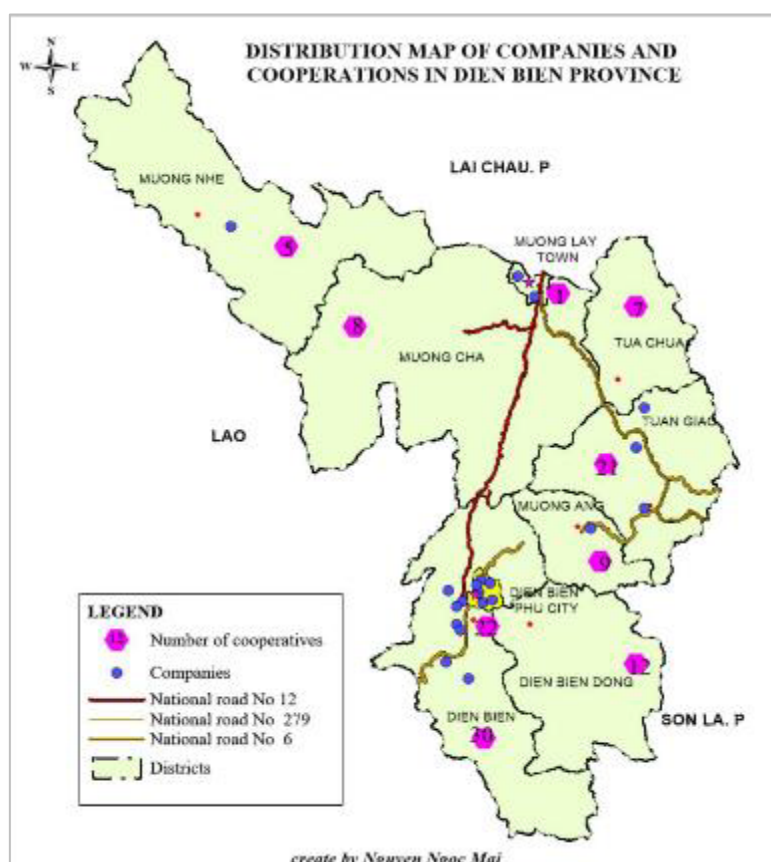


Figure 10. Distribution map of cooperatives and companies in Dien Bien Province (Nguyen Ngoc Mai, 2021)

## A recent focus on value chains development

During the maize boom period (in the 2000's), different Sloping Agricultural Land/ Soil Conservation Technologies (SALT) have been tested and promoted with farmers to reduce soil erosion and land degradation in maize cultivated sloping areas. These models included intercropping systems, reduced tillage with mulching, mini-terraces, forage grass strips or maize canes strips. Since 2015, sloping agriculture is no longer a priority and provincial authorities have been focusing their support to the development of priority value chains through four main levers: support farmers access to inputs and knowledge, support farmers organizations, support local processing of agricultural products, support agricultural products certification and increased visibility.

*Support farmers' access to inputs and knowledge:* priority crops (e.g. fruits and industrial crops) seedlings and fertilizers are subsidized; model farmers are supported by farmers unions; training for farmers capacity building are organized by provincial and district agricultural service centres. For livestock systems, low interest credits are proposed for priority livestock systems (e.g. cattle), technical models development & capacity building are supported (e.g. cattle in stalls, silage, forage technology); free vaccination campaigns are organized (e.g. Bovine pasteurellosis for cattle and Foot and Mouth Disease (FMD), twice a year). But progresses are slow, due to limited governmental support funds (2 billions per district and per year, Annex 15) and external supports (limited number of projects).

*Support to farmers organizations:* the number of registered cooperatives has been booming since 2015, shifting from 77 in 2014 to 242 in 2020 (GSO Dien Bien, 2021; cooperative distribution in Figure 10). These cooperatives are still fragile with 56 of them that were no longer operating in 2020. Among the 186 cooperatives still operating, 121 are working in the field of agriculture (plus 10 in the field of aquaculture). Being organized in cooperative is a prerequisite for farmers to receive supports from the province (e.g. subsidized seedlings and fertilizers).

*Support to local processing of agricultural products:* Dien Bien Province struggles attracting companies to establish in Dien Bien Province. In 2020, 25 companies were operating in the fields of Agriculture, Agro-processing and forest products commercialization (GSO Dien Bien, 2021). These companies are mainly concentrated in Dien Bien Phu city, Dien Bien and Tuan Giao districts (Figure 10). Some cooperatives are also involved in local processing e.g. RAZA coop (Annex 18) which produces concentrated juices (orange, sugarcane, pomelo, fruit wine).

*Support agricultural products certification and increased visibility:* in line with MARD policy to increasingly engage farmers into certification (VietGAP, GlobalGAP, Organic; MARD ARP, 2015), the Province is also supporting VietGAP certification of farmer cooperative, but with limited success so far (high price for certification, limited related premium, difficulty to sell due to Covid situation, etc). The Province favours at the moment other visibility schemes: a provincial recognition (for safe and good product), which is not a formal certificate but a document delivered by provincial authorities once linkages between producers, processors and retailers are estimated as effective. This recognition helps producers to attend market festivals to introduce their products and for admin procedures (stamps, cover letter etc.). 20 Value Chains (VC) are presently recognized: mainly rice and safe food; also dry meat and coffee. The province also follows the national strategy of One Commune One Product (OCOP). 35 OCOPs registered (4 with 4 stars, 31 with 3 stars). However, the impact of OCOP on products visibility is still limited so far due to limited production area and quantities.

## The temptation of High Tech agriculture?

There are no data about the use of bio-products in agriculture. Some producers are using Efficient microorganisms (EM) commercial brands to treat manure, and/or *Trichoderma* for the biological control of pest in vegetable production. The Province supports models of vegetable production in net house, with use of plastic mulch, artificial growing media, drip irrigation and Temperature control.

Some visited farmers are already using high-tech inputs (e.g. micronutrients, calcium nitrate, nano silver, Manganese Oxid etc.) for vegetable production. Most of the information is taken on internet (YouTube) with technical advices also taken from VNUA university and experts from Dalat.

### Forest conservation and forest economy development

This is certainly one of the major past recent transformation in the Province in terms of land and natural resources management.

In the past, forest conservation was a task falling under the mandate of Provincial Department of Natural Resources and Environment (DoNRE). Since 2012, forestland certificates are given to farmers, which receive payments for forest conservation: in 2020, about 8,900 contracts, 270,000 ha, and 270 billions VND were disbursed by the Province to insure forest conservation.

Funds are coming from the private sector (hydropower Companies, Tilapia farms) for water resource conservation (quantity and quality) and managed by the Forest Management Unit under DARD at provincial and district levels

There is a Provincial plan to develop forest medicinal plants.

### Tourism and agro-tourism

There is an historical tourism in relation with France (Dien Bien Phu battle museum).

The Province would like to develop tourism by taking advantages of local landscape beauty: Hoa Ban (local tree), peach-blossoms (e.g. RAZA cooperative), and agro-tourism to promote local agriculture products (e.g. honey, dry meat, coffee), animal by-products (e.g. products made from horns, skins etc.) or animal-based services (e.g. riding cow/buffalo). But still a plan at that stage.

Some on-going tourism private initiatives to link landscape beauty to local products (e.g. waterfall/ forest / fish production model from Tilapia fish company in Annex 29).

## 3.6 Agricultural systems

*Crop production:* Crop distribution is different according to elevation with 3 major agroecologies identified (adapted from Thi *et al.*, 2017):

- **< 400m asl:**
  - Rice, vegetable
  - Fast growing timber on degraded soils (e.g. acacia, eucalyptus, *Manglietia*, *Styrax*)
- **400m - 800m asl:**
  - Maize, upland rice, cassava, cana
  - Rubber, fruits
- **> 800m asl:**
  - Coffee, tea, temperate fruits
  - Cardamom under natural or planted forest

Difference in crop distribution are also observed according to districts (different ecologies and market opportunities):

- Paddy rice mainly in Dien Bien District (Muong Thanh valley is with 13 000 ha the largest rice-growing valley in northern Vietnam), DBP city, Muong Ang, and Tuan Giao districts
- Maize mainly in Tua Chua, Tuan Giao and Dien Bien Dong Districts
- Cassava mainly in Tuan Giao, Dien Bien, Dien Bien Dong districts
- Rubber in Muong Cha, Dien Bien, and Tuan Gia districts
- Coffee in Muong Ang and Tuan Giao districts
- Macadamia mainly in Muong Ang and Tuan Giao districts
- Shan Tea in Tua Chua district



With 190,000 tons produced in 2020 (Table 4), rice (lowland and upland) is the main agricultural production in the Province. Dien Bien is well known at national level for its high quality rice e.g. Hana, Sheng Cu, aromatic rice Bac Thom N°7, IR64, glutinous rice. A Geographic indication (GI) was registered for Bac Thom Not variety. The Province is supporting paddy rice cropping system improvement through the promotion of rice transplanters (50 units subsidized) that are expected to improve labour productivity, better rice density and growth homogeneity (DARD Dien Bien, 2021).

With about 80,000 tons produced in 2020 (Table 4) maize is the second largest agricultural production. Main constraints to maize production are decreasing prices and Fall Army Worm (FAW, *Spodoptera frugiperda*) whose pressure is increasing in north western region (MARD 2021).

Coffee is presented by local authorities as a major cash crop despite decreasing cultivated area (Figure 8). Main constraints for coffee production are: fluctuating and globally decreasing prices, local variety (Catimor) sensitive to water shortages/stress, poor coffee quality, pest pressure (borers, nematodes), water and equipment for coffee processing (beans washing and drying; Rigal, pers. communication). Preliminary results from BREEDCAFS project show that new varieties could help reducing sensitivity to water stress, improve productivity and quality of coffee production (Marraccini, pers. communication).

*Livestock systems:* Pigs, poultry and buffalo, are the main source of animal-related income (Table 5).

Provincial plan to intensify big livestock feeding systems through forage technology development. DARD is promoting the planting of King elephant grass VA06 (high yielding), Mulato II, Guinea Grass plots near animal stalls/houses, winter season forage maize cultivation in lowlands, and silage production in partnership with various partners (e.g. ACIAR, NIAS, TUA, TBU, CIRAD, Aus partners, JICA) through notably the Beefcattle II project (Annex 5).

This promotion targets all districts. 780 ha of planted forage grass so far (GSO Dien Bien, 2021) with forages need estimated to 5,800 ha (DARD Dien Bien, 2021).

Little connections are observed so far with projects/partners working on Agroforestry systems with forage grass strips (e.g. AFLI II project).

Connections are existing between large pig farms and CP, Macadamia and TH Milk (in Son La Province) companies for pig manure use.

## 4. Status against selection criteria

### 4.1 Site relevance regarding targeted challenges

Sub-criteria	Score
1.1 Challenge #1: Agriculture systems connected to urban areas: Feeding booming cities through safe and fair food circuits	2
1.2 Challenge #2: Rice-based systems in lowlands: Sustaining rice production as the cornerstone of food and farming systems	2.5
1.3 Challenge #3: Crop-livestock-forest in rainfed uplands: Preserving uplands from social and environmental degradations	3

*Scoring options: 0. Not relevant; 1. Little relevant; 2. Relevant; 3. Highly relevant.*

Due to its location (mountainous area, mountainous agriculture under steep slopes), current land cover (42% forest land), and population (ethnic minorities), the preservation of upland crop-livestock-forest systems (challenge 3) appears as highly relevant in the Province. However, the absence of clear local objectives and policy to reduce the impacts of annual crop-based sloping agriculture (e.g. maize, cassava, upland rice) on soil erosion and land degradation is a constraint to tackle this challenge.

Agricultural product value chains development and support for increased connections with national and international markets is a major challenge in the Province. Province distance to surrounding urban areas (remote area) makes it challenging, but still, an increased and better connection of local agricultural systems to cities (challenge 1) seems relevant.

Lowland paddy area covers about 30,000 ha in the Province which is small as compared to total agricultural land (about 360,000 ha). However, paddy rice is the favourite farmers investment strategy when and where possible, and challenges to improve paddy rice production sustainability and increased visibility are relevant.

## 4.2 Opportunity for change and for impact

Sub-criteria	Score	Remark
2.1 Local perceptions of agricultural and food systems limits	2	<i>0 is eliminatory</i>
2.2 Level of interest from local authorities	2	<i>0 is eliminatory</i>
2.3 Level of interest from producers	2	<i>0 is eliminatory</i>
2.4 Level of interest from other market system actors	2	
2.5 Potential for market innovations	2	

- Local perceptions of agricultural and food systems limits

Scoring options:

0. Limits are perceived by producers or local decision makers but not by both.

1. Limits are perceived and acknowledged by producers and local decision makers but solutions and/or levers are not yet identified

2. Limits are perceived and acknowledged by local stakeholders, solutions and/or levers are identified but not yet mentioned in local rural and agricultural development plans

3. Limits are perceived and acknowledged by local stakeholders, solutions and/or levers are identified and mentioned in local rural and agricultural development plans, with set objectives and related strategy

The limits from current agricultural systems (e.g. remoteness, fluctuating and decreasing prices for maize and coffee, soil erosion in sloping areas) are well perceived. However, the potential limits from the current agricultural development strategy (support to fruit and industrial crop sector development) are not discussed e.g. Investment costs to shift from annual to perennial cropping systems and supporting mechanisms? Profits and return on investment of fruit tree plantations in a context of decreasing prices? Water, pesticides, and plastic use for fruit and legumes production?

- Level of interest of local authorities

Scoring options:

0. Limited interest of local authorities for the project and project objectives

1. Some interest but no resources identified to support the project implementation

2. Local authorities are interested and plan to allocate human resources for the project

3. Local authorities are interested and plan to allocate both human and financial/logistic resources for the project

Local authorities are interested and willing to allocate human resources for the project.

- Level of interest of producers

Scoring options:

0. Limited interest from farmers for AE and SFS innovations

1. Some farmers interested but implementation of AE systems rely on external support (project)

2. More farmers interested. Some of them are implementing AE systems without external support

3. Many farmers interested in the same location (village/village cluster. district). Farmers are organized to support the AE and SFS development process (cooperative, association, committee)

Some farmers and local entrepreneurs are already implementing AE practices without external supports (e.g. plum-coffee agroforestry systems, safe vegetable, high-quality rice and honey). Many farmers are organized into cooperatives, but the way these cooperatives are operating can still be improved. In addition, farmers motivation for engaging into quality practices is still uncertain.

- Level of interest of other market system actors

Scoring options:

0. Beyond producers, no off-takers (e.g. traders, processors, service providers, wholesaler, retailer, consumers)

1. Some off-takers but passive

2. More off-takers, including active ones

3. Many off-takers, including active ones. Existing (or under-construction) local platform supporting increased linkages between market systems actors

The motivation of market system actors others than producers was difficult to assess and appear highly variable between value chains and actors. Macadamia company provides support and minimum guaranteed price for farmers transitioning to Maca production. Entrepreneur du monde is working with ACE to develop short and quality-based value chains for ethnic minorities.

- Potential for market innovations

Scoring options:

0. Limited possibilities of market diversification, market extension, complementary products development and placement; 1. Some possibilities but little explored yet; 2. Possibilities under exploration (existing feasibility studies) up to pilot testing – small scale initiatives are in place

3. Market innovations are existing. New and/or complementary products are already placed, and certification, labelling and quality management mechanisms are in place. Actions are taken to gain in visibility and efficiency.

Geographic indications have been successfully tested (e.g. Bac Thom Not variety) but still remain limited. OCOP (One commune One Product) existing strategy but with limited impact so far. Online sales supported by the Province but poor implementation so far. Some successful models of agroecotourism with waterfall and fish production (but niche market).

### 4.3 On-going innovations and dynamics related to agroecology and safe food systems (ASSET)

Sub-criteria	Score
3.1 Technical innovations	2
3.2 Organizational innovations	2
3.3 Institutional innovations	2

A total score <3 is eliminatory

- *Technical innovations: AE practices (OA, AF, CA, SRI, AECF, crop-livestock etc.), on-farm and on-station experiments, post-harvest processing, waste management, bio-products, innovative agricultural machinery etc.*

Scoring options:

0. No initiatives/projects working on technical innovations

1. Existing technical innovations but not aligned/relevant regarding flagship main targeted challenges

2. Existing technical innovations that are relevant with flagship challenges but the level of adoption/adaptation by farmers is low

3. Existing relevant technical innovations that are applied and visible in outstanding sites

Dien Bien Province has some past experience in promoting sloping agricultural land technologies (SALT; e.g. ADAM and/or EU projects in the mid-2000's). Those initiatives allowed developing technologies for maize and cassava cultivation on slopes, including intercropping, minimum tillage combined with mulching, establishment of forage grass strips and/or mulch strips. But the dissemination of these sustainable land management practices was overall limited.

Agroforestry systems have also been supported by various partners e.g. ICRAF, NOMAFSI, CIRAD, VNUA. The AFLI (Agroforestry for livelihoods of smallholder farmers in northwest Vietnam) project has tested different AF models notably in Tuan Giao district:

- Son tra- forage grass strips,
- Acacia - mango - forage grass strips,
- Longan - maize - forage grass strips,
- Shan tea - forage grass strips,
- Acacia - longan – coffee – soybeans – forage grass strips,
- Teak – plum – coffee – soybeans – forage grass strips,
- Macadamia – coffee – soybeans.

Despite positive results regarding AF systems profitability (Figure 11), impacts on soil erosion prevention, fertilizers and nutrients losses reduction (Figure 12, 10-30T of soil retained/year/ha as compared to maize mono-cropping), AF systems adoption is still limited (about 80 ha of model farmers). Labour requirements for the cut& carry of forages, distance from field to animal stalls, and access to plant material (forage cuttings) seem to be the main constraints for adoption.

Different partners are working on livestock system sustainable intensification, notably working and fodder systems. Existing models and data related to animal raising in pens, durum maize production, silage production and use as complementary animal feed.

Other technical innovations including the use of e.g. new varieties with higher quality and different growth cycles (late vs early ripen) have also been mentioned (notably for Son Tra apple, collection) but their adoption status is not known.

- *Organizational innovations: Participatory land use planning, farmer's access to market and services, farmers interactions with consumers, private and public actors, quality management, etc.*

*Scoring options:*

*0. No initiatives/projects working on organizational innovations*

*1. Existing organizational innovations but not aligned/relevant regarding flagship main targeted challenges*

*2. Existing organizational innovations that are relevant with flagship challenges but the level of institutionalization and/or autonomy of the organizations and platform that emerged is still low, fragile, and highly dependent on external/project support*

*3. Existing relevant organizational innovations. The organizations and/or platforms are operational and autonomous (or have a strategy towards autonomy)*

There is a strong support and trend for farmers organizing into cooperatives to favour access to inputs, knowledge and markets. However, this process is still recent (> 2015) and many of these cooperatives need to be strengthened.

- *Institutional innovations: Access to inputs (seeds, bio products, machinery), visibility of AE products (branding, certification, marketing), sensitization campaigns, local entrepreneurship, policy dialogue mechanism, Incentives etc.*

*Scoring options:*

*0. No initiatives/projects working on institutional innovations*

*1. Existing institutional innovations but not aligned/relevant regarding flagship main targeted challenges*

*2. Existing institutional innovations that are relevant with flagship challenges but that are still under way and highly dependent on external/project support*

*3. Existing relevant institutional innovations that led to the definition of new policies and/or support mechanisms. Supports for the enforcement/application of these policies are set or planned*

Existing institutional strategy for value chain development (branding, certification, promotion of local products in national fairs) and incentives (subsidized inputs for priority value chains) but policies related to quality management (production, waste management, processing and packaging) can still be improved. Policies and incentives related to livestock systems development are still unclear (e.g.

animal feed need assessment and feeding systems development strategy, animal health management).

#### 4.4 Opportunity for partnerships

Sub-criteria	Score
4.1 Number and diversity of potential partnerships	2
4.2 Flagship accessibility	1

- Number and diversity of potential partners that could be associated through the intervention

Scoring options:

1. Local decision makers, farmers, and research institutions are the main partners
2. The partnership could involve other stakeholders but who have little leverage power on the transition process
3. The partnership could involve other stakeholders with potentially high leverage power (e.g. consumers groups, private company)

Limited number of stakeholders involved in the field of agroecology and safe food systems (Figure 13) but still the possibility to build partnership between national and local governmental institutions, NGOS (e.g. ACE, CCD, CARE, SNV), national universities (TBU, VNUA), and the private sector (farmers groups, companies working in the field of coffee, livestock, fruit and macadamia development).

### Profitability analysis of agroforestry systems compared to maize monoculture

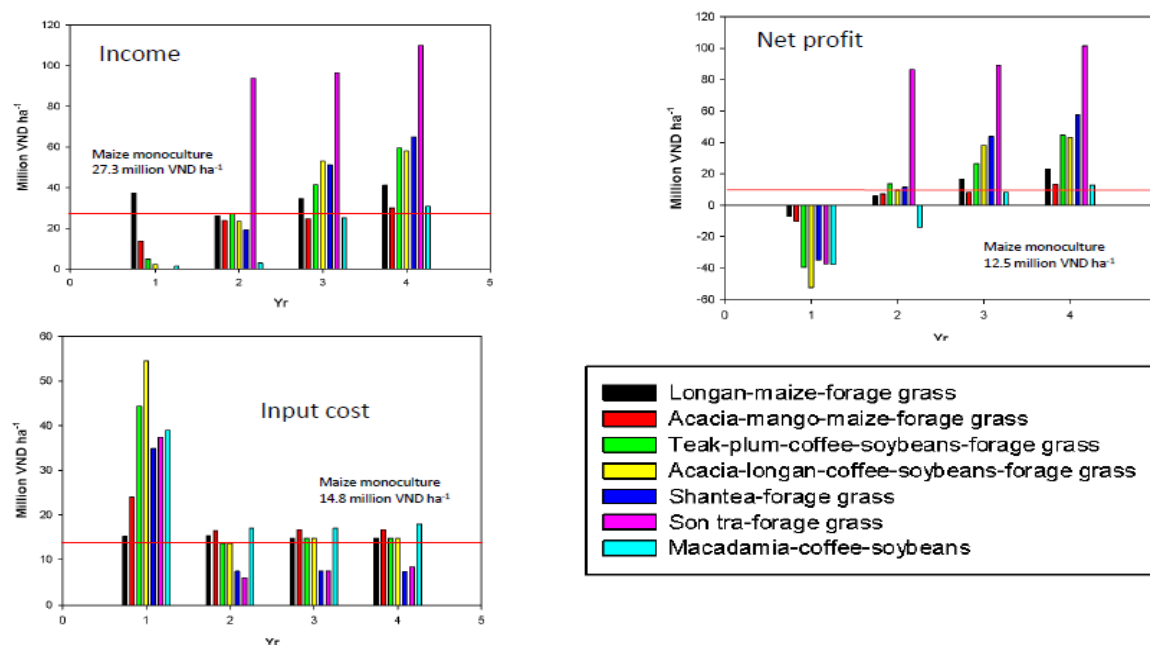


Figure 11. Profitability analysis of agroforestry systems (Icraf, 2019)

## Soil erosion control

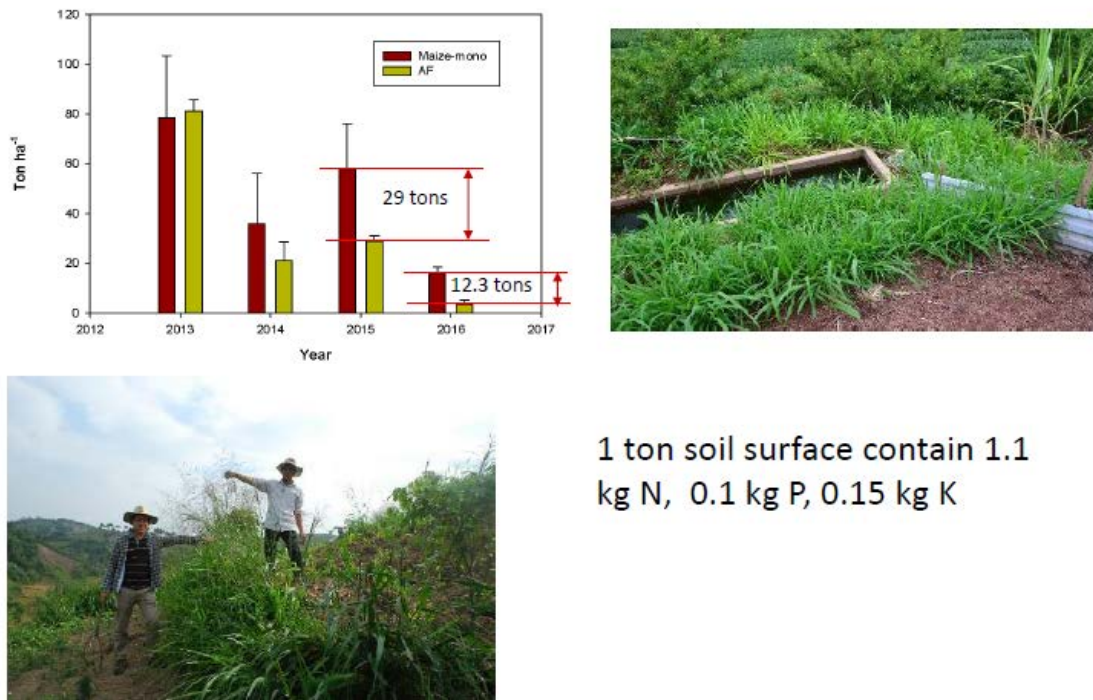


Figure 12. Soil erosion control under agroforestry systems (Icraf, 2019)

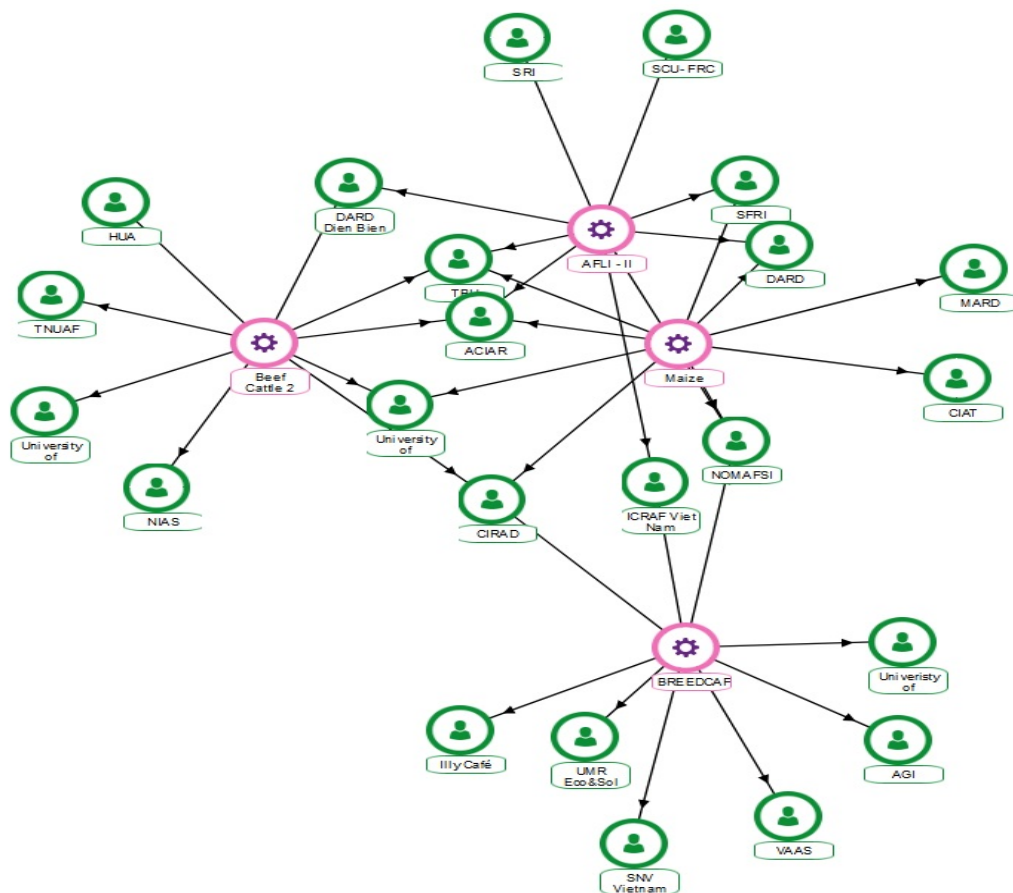


Figure 13. Mapping of the main stakeholders intervening in Dien Bien Province (De Villiers, 2021)

- *Flagship accessibility: the accessibility of the site may affect the frequency and cost of interventions, as well as the opportunities for strengthening and improving the connections to market.*

Scoring options:

0. *The flagship is at more than 8 hours driving distance from national capital and cannot be reached by air transportation;*
1. *The flagship is at more than 8 hours driving distance from national capital but can be reached by air transportation;*
2. *The flagship is at more than 4 hours but less than 8 hours driving distance from national capital;*
3. *The flagship is at less than 4 hours driving distance from national capital*

#### 4.5 Opportunity for co-funding of field activities

Criteria	Score
5. Opportunity for co-funding of field activities	1

Scoring options:

0. *The opportunities for co-funding of field activities are limited to nul*
1. *Other initiatives would agree to contribute to the funding of joint-activities (e.g. training, workshops, exchange platform etc.)*
2. *Other initiatives would agree to support the funding of out-scaling activities but below a maximum total contribution of 50,000 euros/year*
3. *Other initiatives would agree to support the funding of out-scaling activities beyond a contribution of 50,000 euros/year*

This aspect was difficult to assess at that stage. But opportunities of co-funding activities at minima with Dien Bien DARD and ACIAR projects.

#### 4.6 Local expertise/champions that can be mobilized to support the transition process

Criteria	Score
6. Local expertise/champions	1.5

Scoring options:

0. *Little to no local experts to support the transition process*
1. *Some local experts/champions but not available or interested to support the transition process*
2. *Some local experts/champions interested and ready to engage but having limited recognition/leverage power*
3. *Some local experts/champions interested and ready to engage, having strong experience in exchanging with other stakeholders and benefiting from a good recognition/reputation at local level*

Some experienced farmers and/or cooperative leaders that could be mobilized in farmer-to-farmers (F2F) or training of trainers (ToT) processes

#### 4.7 Existing data and knowledge

Sub-criteria	Score
7.1 Current land cover and land use, LULC changes and land use trajectories	1
7.2 Local food systems	1
7.3 Agricultural value chains and quality	0,5
7.4 Local livelihoods and livelihood development strategies	1
7.5 Situation of youth, women, and ethnic minorities	1
7.6 Local policies and rural development strategies	1
7.7 Agricultural extension facilities and strategy	1
7.8 Actors and investment in the agribusiness sector	1
7.9 Performance and impact of conventional agricultural systems	0
7.10 Performance and impact of innovative AE and SF systems	0,5

Scoring options:

0. Data not existing or available;

1. Data existing, available but partial and/or fragmented

2. Data existing, available; recent and comprehensive review of the situation

See literature review in chapter 6.

## 4.8 Intervention area and number of potential beneficiaries

Criteria	Score
8. Number of potential beneficiaries	2

Scoring options:

1. <500 ha and/or 500 smallholders

2. From 500 to 2,000 ha and/or smallholders

3. > 2000 ha and/or 2000 smallholders

Difficult to assess at that stage.

## 4.9 Environmental and Social Risks

The status of the site regarding five main environmental and social risks are presented in Table 7 (next page).

# 5. Conclusion

## 5.1 Scoring results

Table 6. Recap scoring against selection criteria

Criteria	Flagship score	Maximum Score	Flagship score_%
1. Site relevance	6,5	9	0,83
2. Opportunity for change and impact	11,5	15	0,67
3. On-going innovations and dynamics related to AE and SFS	6	9	0,67
4. Opportunity for partnership	5	6	0,50
5. Opportunity for co-funding	1	3	0,33
6. Local expertise and champions	2	3	0,50
7. Existing data and knowledge	11	20	0,40
8. Number of potential beneficiaries	2	3	0,67



Table 7. Main environmental and social risks in Dien Bien Province

	YES	NO	Comments
1. Location: Does the site include or is it in close proximity to:			
<ul style="list-style-type: none"> <li>A protected area</li> </ul>	X		<ul style="list-style-type: none"> <li>Muong Nhe Nature Reserve, located in Sin Thau, Muong Nhe, Nam Ke, Chung chai and Leng Su Sin communes, in Muong Nhe district (45 581ha)</li> <li>Muong Phang-Pa Khoang Species and Habitat Conservation Area in Dien Bien District</li> <li>Protective forest 210,000 ha (2018)</li> <li>Biodiversity Corridor: Muong Nhe - NamKhanh - Muong Tung (26.65 km), The Nam Khan - Muong Tung - Huoi Leng - Na Tau (10.86 km); The Huoi Leng - Na Tau - Pa Khoang - Muong Phang (7.12 km), The Pa Thom - Muong Nha (7.67 km)</li> </ul>
<ul style="list-style-type: none"> <li>A sacred or cultural site</li> </ul>	X		<ul style="list-style-type: none"> <li>Martyrs Cemetery A1 is located in Muong Thanh Ward, Dien Bien Phu City</li> <li>Ban Phu citadel is located in Noong Het commune, Dien Bien district</li> <li>Temple of Hoang Cong Chat in Chieng Le citadel</li> <li>Linh Son Pagoda, in Thanh Luong commune, Dien Bien district</li> <li>Dien Bien Phu battle sites and artefacts (memory of Indochina war) in Dien Bien Phu city, DB district, and Tuan Giao district</li> </ul>
<ul style="list-style-type: none"> <li>Wetlands, mangroves</li> </ul>		X	
2. Is the project require (land use)			
<ul style="list-style-type: none"> <li>A change in land rights (formal or traditional)</li> </ul>			Not relevant: flagship site not yet selected
<ul style="list-style-type: none"> <li>Economic losses for all or part of the target populations (including informal uses)</li> </ul>			Not relevant: flagship site not yet selected
<ul style="list-style-type: none"> <li>Increase deforestation</li> </ul>			Baseline: Forest cover of 39% in 2018 (Dien Bien Statistical yearbook) with three forest categories: Special use forest (13%), Protection forests (57%), production forests (30%) in 2018
3. Site Context			
<ul style="list-style-type: none"> <li>Are indigenous peoples or traditional local communities present in the project area?</li> </ul>	X		19 different ethnic groups; Thái (39%), Mông (35%), Kinh (20%), and others (7%) with Khơ Mú, Dao, Kháng, Lào, Ha Nhi, Hoa, Xinh Mun, Tay, Mường, Cống, Nùng, Thổ, Phu La, Si La, Sán Chảy and others.
<ul style="list-style-type: none"> <li>Are there any protected species or critical habitats in the site?</li> </ul>	X		41 local floral species listed in Vietnam’s Red Book and IUCN Red List, 1 fish species (milkfish recorded in the Red Book of Vietnam in 2007). The Muong Nhe nature reserve planning scheme, the action plan on biodiversity conservation and Decision on Muong Phang historical relic site management are policies and legal documents on biodiversity conservation in Dien Bien
4. Would the project likely to cause			
<ul style="list-style-type: none"> <li>Loss or restriction of access to natural resources (water, timber, gathering)</li> </ul>			Not relevant: flagship site not yet selected
<ul style="list-style-type: none"> <li>Increases in :                             <ul style="list-style-type: none"> <li>o Water requirements,</li> <li>o Erosion risks,</li> <li>o Flooding risks</li> <li>o waterborne diseases</li> </ul> </li> </ul>			
5. Have local changes due to climate change been taken into account in the project design?			Not relevant: flagship site not yet selected; but CC is an issue in the Province (increased frost event negatively impacting crops, notably coffee)

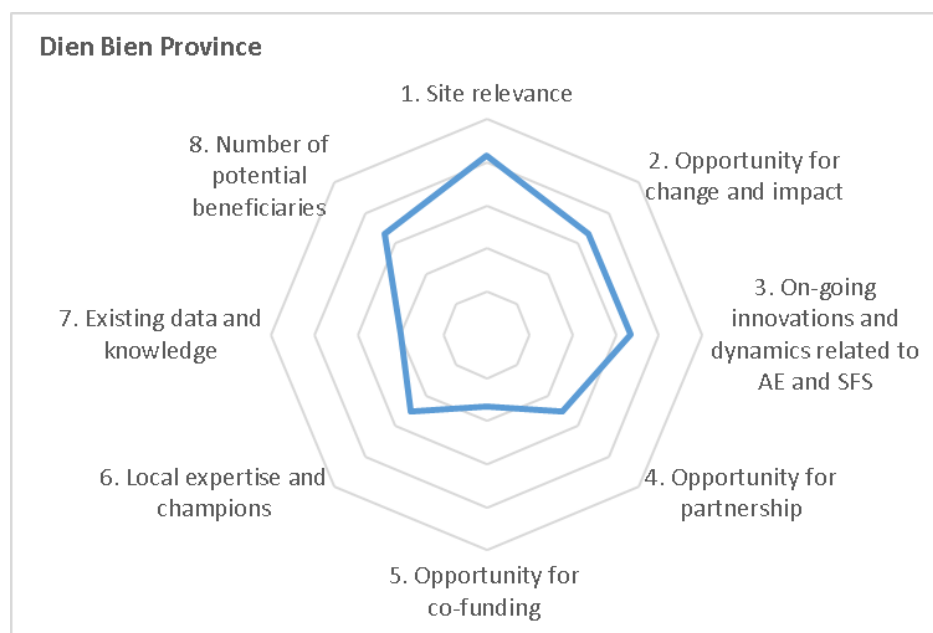


Figure 14. Spidergram representation of scoring for Dien Bien Province

## 5.2 Site average note

Table 8. Site average note

Criteria	Coefficient weighting	Site
1. Site relevance	1	0,83
2. Opportunity for change and impact	5	3,33
3. On-going innovations and dynamics related to AE and SFS	4	2,67
4. Opportunity for partnership	1	0,50
5. Opportunity for co-funding	2	0,67
6. Local expertise and champions	3	1,50
7. Existing data and knowledge	3	1,20
8. Number of potential beneficiaries	1	0,67
<b>TOTAL</b>	<b>20</b>	<b>11,4</b>

## 5.3 Global assessment: Advantages and drawbacks for selecting the site as flagship site in Vietnam

### Main advantages

- Possibility tackling simultaneously the three identified main challenges:
  - uplands preservation from degradation
  - food circuit safety improvement (fruits, vegetable, meat)
  - Sustainability and visibility of high-quality paddy rice production
- Existing models/ research results: Agroforestry (AFLI 2), Coffee (BREEDCAFS), livestock (Beef Cattle II)
- Strong willingness from local partners (DARD, local NGOs) to support and collaborate with the project
- Potentially strong impact of interventions (early stage of innovation process – fruit and industrial crops development and livestock intensification)
- Possible co-funding of activities with ACIAR (fruit, livestock)

### Main drawbacks

- Distance from Hanoi (12h drive, airport but cost/flight uncertainties); travelling within the Province is still difficult (remote districts)
- Few on-going development projects (some large-scale e.g. macadamia, rubber; few small-scale e.g. ACE, CARE, SRD)
- Limited outstanding success stories so far
- No clear objectives/strategies for areas/village communities distant from the main roads
- No clear objectives/strategies to sustain agriculture in sloping areas
- No clear development strategies for not-yet used areas (~250,000 ha): support to large-scale private investment vs smallholder farming?

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## Annex 1: List of the main projects and initiatives identified in Dien Bien Province

N°	Project name	Acronym	Main topic / objective	Main crop /Ag. product	Implementing institution(s)	Project Partner(s)	Funding agency(ies)	Period
1	Breeding Coffee for Agroforestry Systems	BREEDCAFS	Agroforestry develop, Plant material selection	Coffee	CIRAD	NOMAFSI, AGI VAAS, SNV UoC, Illy Café	H2020	2017 - 2021
2	Sticky rice	Sticky rice		Rice	DARD		Province	
3	Developing and Promoting Market-based Agroforestry and Forest Rehabilitation Options for Northwest Vietnam	AFLI-II	Agroforestry develop, Value Chain development, Sustainable NRM		ICRAF	SCU, DARD SFRI, NOMAFSI VAFS	ACIAR	2017 - 2021
4	Intensification of beef cattle production in upland cropping systems in Northwest Vietnam	BEEFCATTLE II	Livestock systems improvement	Cattle	UoT	CIRAD, NIAS HUA, TNUAF TBU, DARD, UQ	ACIAR	2017 - 2022
5	Shan tea Production		Shan tea processing and tracability	Tea	Private Cie	DARD		
6	Food and nutrition						FAO	
7	Macademia Project		Public and private intervention, Macademia production, certification	Macademia	Private Cie			2015
8	Rice microproject		Alternative use of chemical and pesticides Use of lime	Rice	Anch Chi Em	DARD Dien Bien district	EdM	2019- ...
9	Weaving microproject	Weaving project	Organic cotton production Traditional dying technics Marketing skills and value chain linkages	Cotton	Anch Chi Em	Trend Ethics	EdM	2019
10	Red worm compost microproject		Vermicomposting development and animal waste transformation and spreading for the 2 <sup>nd</sup> phase	Worm compost	Anch Chi Em	Agricultural extension service, People Committee	EdM	2019- 2021



11	Microfinance		Production of Maize silage Loans for animals (chickens, pigs), for crops (coffee, industrial crops, Cana...) or input	Animal, crops and input	Anch Chi Em	Women union, farmer union, Agricultural extension center	Edm	2019 - ...
12	Scaling Landscape Options through Provincial Engagement	SLOPE	Agroforestry development		ICRAF	DARD PAEC	CIFOR- ICRAF	2020 - 2021
13	Information for adaptation in Vietnam	InfoAct	Improvement of farmers access to climate information, Risk insurance		CARE	CCD Lai Chau DARD Lai Chau WU	BMZ	2018 - 2021
14	Technologically Enhanced Agricultural Livelihoods	TEAL	Post harvest processing improvement	Coffee	CARE	Điện Biên CCD Sơn La DARD Coffee Cies	Aus-DFAT	2017 - 2021
15	Master plan for restructuring agricultural sector	ARP				Gov Vietnam		> 2015

## Annex 2: List of the on-line interviews with key informants (Aug- Dec 2020)

Nom	Organisation	Fonction	Projet	Zone d'intérêt	Date
Thanh Huyen Le Thi	NIAS	Senior Researcher	Beefcattle 2	Dien Bien	19-août
Dao The Anh	VAAS	Vice President		Vietnam	26-août
Guillaume Duteurtre	CIRAD	Senior Researcher		Vietnam	31-août
Hai Thanh Hoang	Rikolto	Program Coordinator		Hanoi	01-sept
Oleg Nicetic	ACIAR - UQ	Senior Researcher	vegetable, maize, temperate fruits	Nord-Ouest	03-sept
Clément Rigal	CIRAD - ICRAF	Senior Researcher	BREEDCAFS, Ecoffee	Vietnam	04-sept
Denis Sautier	CIRAD	Senior Researcher	SRA café poivre	Vietnam	04-sept
J.-C. Castella	IRD	Research Directeur		Vietnam	07-sept
Tan Loc Nguyen Thi	FAVRI	Researcher	Filière légume	Vietnam	09-sept
Linh Hoang Nguyen	CASRAD	Researcher	Filière légume	Vietnam	09-sept
Nguyen Thi Thanh Hai	NOMAFSI	Researcher	AFLli	Nord-Ouest	18-sept
Tu Tuyet Nhung	PGS Vietnam	President of PGS Vietnam		Vietnam	21-sept
Mayu Ino	Seed to table	President of Seed to Table		Vietnam	28-sept
Alice Carton	Entrepreneurs du monde	Référente Technique Agricole	Anh Chi Em	Dien Bien	29-sept
Amelie Germette	Entrepreneurs du monde	Responsable de l'Appui Technique Vietnam	Anh Chi Em	Dien Bien	29-sept
Pierre Ferrand	FAO	Agricultural Officer (Agro-ecology)	TAPE	Vietnam	01-oct
Ha Thi Lan Anh	Fresh Studio	Business Development Manager	Filière légume	Son La	02-oct
Mai Huong Nguyen	IPSARD- RUDEC	Deputy Director	Projects gov.	Vietnam	07-oct
Martina Spisiakova	APAARI	Knowledge Management Coordinator		Vietnam	12-oct
Fed Unger	ILRI	Senior Scientist	Safe Pork	Nord	09-déc
Hung Nguyen Phi	NOMAFSI	Senior Scientist	Maïs	Nord-Ouest	10-déc

### Annex 3: Project Description form – AFLII

Name of the project : Developing and Promoting Market-based Agroforestry and Forest Rehabilitation Options for Northwest Vietnam

Project acronym : AFLII

Documents or web page introducing the project / initiative :

<https://www.aciar.gov.au/project/FST-2016-152>

<https://reachout.aciar.gov.au/impacts-through-agroforestry-in-northwest-vietnam>

Contact persons :

Name : Nguyen La

Email : [l.nguyen@cgiar.org](mailto:l.nguyen@cgiar.org)

Telephone :

Name : Nora Devoe

Email : [nora.Devoe@aciarc.gov.au](mailto:nora.Devoe@aciarc.gov.au)

Telephone :

Project presentation :

The expansion of the mono-cropping systems through shifting cultivation and forest conversion has degraded forests and caused losses in yield and stable food supply for thousands of farmers in Northwest Vietnam. Moreover, lucrative markets for livestock feed is driving a transition to maize mono-cropping in this steep, sensitive terrains. As a result, the region is experiencing severe soil erosion.

One solution to the region's growing, interconnected challenges is the right mixture of forest rehabilitation and market-based agroforestry systems, which revitalizes the soil, forests, and performance of smallholder farming systems. Recognizing the potential of agroforestry, ICRAF Viet Nam, with support from the Australian Centre for International Agricultural Research (ACIAR) and the Research program on Forests, Trees and Agroforestry of Consultative Group on International Agricultural Research (CGIAR), is implementing a comprehensive agroforestry and forest rehabilitation research with local partners in Northwest Viet Nam.

o Main objectives :

This project aims to develop and promote market-based agroforestry options to improve livelihoods and enhance forest and landscape management. The specific objectives are to:

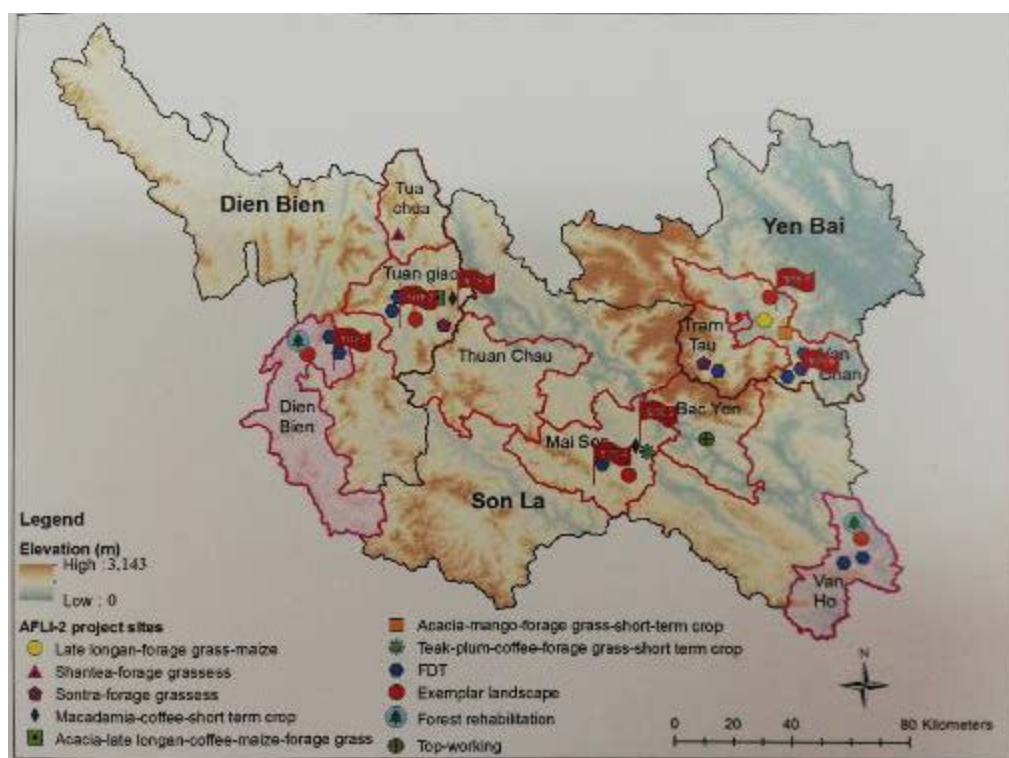
- Quantify and evaluate the performance of generic agroforestry options and tree species to underpin investment in promoting agroforestry. Understand the suitability of different agroforestry options in relation to different contexts and develop markets and policy to scale up adoption
- Understand the ecological and economic values of degraded forests and co-develop appropriate forest rehabilitation methods with local communities to enhance them.
- Understand drivers of land use change and develop cross-sector planning approaches for landscapes, integrating forests and agroforestry land uses.
- Develop local capacity for agroforestry, forest rehabilitation and integrated landscape management

o Main expected scientific results :

- Analysis of the interactions among components of multi-strata agroforestry practices (in terms of resource capture) and their long-term economic and ecological performance compared with simpler alternatives greatly enriching the growing body of agroforestry knowledge in the tropical world.

- Knowledge from participatory monitoring on the network of farmer demonstration trials enabling novel inference about the suitability of different agroforestry options over the range of contexts encountered in northwest Vietnam.
  - Suitability maps for various agroforestry options in three provinces, incorporating social, cultural, ecological and market aspects.
  - New knowledge on the economic and environmental benefits arising from alternative approaches to forest rehabilitation on degraded sites.
  - Greater knowledge on scaling up approaches for agroforestry.
  - Increased agroforestry research and teaching capacity by Tay Bac University lecturers, consequently helping to build the capacity of future agroforesters in the region
    - o Expected outcomes :
      - Increased productivity, income and farming systems' resilience, resulting from adoption of appropriate agroforestry systems, components and practices by farmers.
      - Increased research and extension capacity, resulting from formal and non-farm trainings, peer learning and mentoring, as well as capacity of women farmers to utilise agroforestry information.
      - Better targeting of policy incentives and rural development interventions at province, district and/or commune levels, consequently stimulating agroforestry investments by farmers.
      - Improved conditions of remnant natural forests, as a result of adoption of appropriate forest rehabilitation techniques by forest communities.
      - Increased livelihood opportunities for farmers and forest people from agroforestry products and sustainable extraction of non-timber forest products.
      - Improved capacity for integrated landscape planning by the Department of Agriculture and Rural Development and the Department of Natural Resources and Environment and other relevant stakeholders, leading to better programming of forest rehabilitation and agroforestation efforts in the focal provinces
- 
- 🍃 Project starting date : April 2017
- 🍃 Project ending date : August 2021
- 
- 🍃 Implementing institution(s) : World Agroforestry Center - ICRAF
- 🍃 Project Partner(s) :
  - o Southern Cross University
  - o Vietnam Department of Agriculture and Rural Development - DARD
  - o Soils and Fertilizers Research Institute - SFRI
  - o Northern Mountainous Agriculture and Forestry Science Institute - NOMAFSI
  - o Tay Bac University
  - o Vietnamese Academy of Forest Sciences - VAFS
- 
- 🍃 Budget : AU\$2,700,000
- 🍃 Funding agency(ies) :
  - o Australian Centre for International Agriculture Research – ACIAR
  - o Consultative Group on International Agricultural Research- CGIAR
- 
- 🍃 Localisation  
Country : Vietnam

State/Province	District	Village
Son La	Thuan Chau	
	Mai Son	
Yen Bai	Tram Tau	
	Van Chan	
Dien Bien	Tua Chua	
	Tuan Giao	



● Area of intervention

- Promoting agroecological systems

- Organic agriculture
- Agroforestry
- Conservation agriculture
- System of rice intensification
- Home garden / permaculture / integrated farming
- Integrated Pest Management / Agroecological Crop Protection
- Crop-livestock farming systems
- Other :

- Supporting farmers access to :

- Seeds and breeds
- Appropriate scale mechanization
- Bio-products
- Market / Labelling
- Land
- Credit / Finance

- Information
- Other :

- Promoting environmental protection :


- Alternative to pesticide use
- Sustainable natural resources management
- Resources use efficiency
- Biodiversity conservation
- Waste reduction and recycling
- Use of renewable energies
- Other :

- Promoting safe food systems :

- Improving food safety quality in response to consumer health concerns (less pesticide residues, less bacterial contamination...)
- Improving food nutritional quality
- Setting up and promoting short and/or local food supply chains
- Standard setting and third party certification (public and private labels) / Branding
- Participatory certification (Participatory Guarantee Systems) / Community supported agriculture
- Traceability / quality management along the chain / contractual arrangements
- Processing of agricultural products
- Other :

- Improvement of advisory / training systems :

- Development of training materials for farmers and field workers
- Reinforcement of agro-ecological curricula in education
- Farmer exchanges of experiences and innovations across sites / farmer field schools
- Innovation platforms
- Strengthening public-private partnerships on agriculture/vocational training
- Other :

 Project activity(ies) :

- Training
- Awareness
- Advocacy
- Technical support
- Financial support
- Support to local entrepreneurship
- Market development
- Value chain management
- Reinforcement of organizational capacities / support to farmer organizations
- Infrastructure construction
- Networking
- Research / Trials
- Other :

## Annex 4: Project description form – BREEDCAFS

● Name of the project : Breeding Coffee for Agroforestry Systems

● Project acronym : BREEDCAFS

● Documents or web page introducing the project / initiative :

- <http://agritrop.cirad.fr/592828/>
- <https://www.breedcafs.eu>

● Contact persons :

Name : Pierre MARRACCINI

Email : marraccini@cirad.fr

Telephone :

Name : Clement Rigal

Email : clement.rigal@cirad.fr

Telephone :

● Project presentation :

- Main objectives :

Devise new ways of tree breeding, leading to productivity and sustainability for perennial tree crops :

- Address coffee adaptation to current and future climate conditions
- Provide a Bioinformatic toolkit
- Research Arabica F1 hybrids and Arabusta hybrids grown in the end-user environment

Improve sustainable coffee production and profitability at farmer and industry level :

- Assess the agronomic performance, profitability and cup quality
- Promote a large-scale production, distribution and use of elite Arabica Hybrids
- Develop a scaling-up plan of the novel BREEDCAFS breeding strategy that ensure dissemination beyond the timeframe of the project
- Manage, communicate and disseminate work carried out and project activities outcome

- Main expected / achieved results :

- Less resource intensive systems
- Less pesticides
- Price stability
- Improved living conditions of farmers/producers
- Higher productivity
- Stability of coffee supply
- Market growth
- Better regulation
- Avoid risks and production losses

● Project starting date : June 2017

● Project ending date : May 2021

● Implementing institution(s) : CIRAD

● Project Partner(s) :

- NOMFASI Northern Mountainous Agriculture and Forestry Science Institute,
- AGI agricultural genetics institute

● Budget : 4,200,00 €

Funding agency(ies) : Horizon 2020 of European Union

Localisation

Country : Vietnam

State/Province	District	Village
Son La	Mai Son	
	Thuan Chau	
Dien Bien Phu	Tuan Giao	

Area of intervention

- Promoting agroecological systems

- Organic agriculture
- Agroforestry
- Conservation agriculture
- System of rice intensification
- Home garden / permaculture / integrated farming
- Integrated Pest Management / Agroecological Crop Protection
- Crop-livestock farming systems
- Other :

- Supporting farmers access to :

- Seeds and breeds
- Appropriate scale mechanization
- Bio-products
- Market / Labelling
- Land
- Credit / Finance
- Information
- Other :

- Promoting environmental protection :

- Alternative to pesticide use
- Sustainable natural resources management
- Resources use efficiency
- Biodiversity conservation
- Waste reduction and recycling
- Use of renewable energies
- Other :

- Promoting safe food systems :

- Improving food safety quality in response to consumer health concerns (less pesticide residues, less bacterial contamination...)
- Improving food nutritional quality
- Setting up and promoting short and/or local food supply chains
- Standard setting and third party certification (public and private labels) / Branding
- Participatory certification (Participatory Guarantee Systems) / Community supported agriculture




- Traceability / quality management along the chain / contractual arrangements
- Processing of agricultural products
- Other :

- Promoting :

- Gender equality
- Youth in agriculture
- Cultural diversity / ethnic empowerment
- Market / Value chain inclusiveness

- Improvement of advisory / training systems :

- Development of training materials for farmers and field workers
- Reinforcement of agro-ecological curricula in education
- Farmer exchanges of experiences and innovations across sites / farmer field schools
- Innovation platforms
- Strengthening public-private partnerships on agriculture/vocational training
- Other :

 Project activity(ies) :

- Training
- Awareness
- Advocacy
- Technical support
- Financial support
- Support to local entrepreneurship
- Market development
- Value chain management
- Reinforcement of organizational capacities / support to farmer organizations
- Infrastructure construction
- Networking
- Research / Trials
- Other :

## Annex 5: Project description form – Beefcattle II

● Name of the project : Intensification of Beef Cattle Production in Upland Cropping Systems in Northwest Vietnam

● Project acronym : Beef cattle II

● Documents or web page introducing the project / initiative :  
<https://www.aciar.gov.au/project/LPS-2015-037>

● Contact persons :

Name : Anna Okello      Email : [anna.okello@aci.gov.au](mailto:anna.okello@aci.gov.au)      Telephone :  
Name : Stephen Ives      Email : [Stephen.Ives@utas.edu.au](mailto:Stephen.Ives@utas.edu.au)      Telephone : +61400586163

● Project presentation :

Vietnam's north-west is one of the country's poorest regions, with 80% of households' income from agriculture and forestry. Livestock production is a pathway out of poverty.

Increased production in the region is constrained by feed and forage availability and animal exposure through long cold winters. Grazing-based livestock systems compete for land with expanding crop production. This in turn has increased soil erosion and sedimentation of waterways, making the current crop-livestock system unsustainable.

Current cattle husbandry practices and sales are linked to culture, ethnicities and the isolation of communities. This isolation is often synonymous with poor linkages to urban markets, misunderstanding of demand/supply dynamics and limited information exchange along the beef value chain. Smallholders are not capitalising on increased demand. Increased beef cattle production in the highlands is seen as a priority to alleviate poverty and address environmental issues of intensified cropping, such as erosion.

○ Main objectives :

This project is improving the income of smallholder cattle producers through intensification of beef cattle production and increased market linkages in mountainous crop-livestock systems in the north-west of Vietnam.

- Understand the transition from extensive to more intensive beef cattle production.
- Develop production technologies and practices that support more intensive, integrated crop-livestock systems.
- Improve farmers' linkages to urban beef markets. Build capacity of beef value chain stakeholders to support and out-scale sustainable cattle production systems in the north-west highlands.

○ Main expected / achieved results :

- Adoption of innovative practices by farmers.
- Increased growth and reproduction of cattle, and increased sales will improve household incomes by at least 32%.
- Improved market understanding and linkages between farmers and traders.
- Profitable cattle feeding systems, integrated with cropping.
- Improved environmental sustainability.
- Improved gender equity and education for children.
- Increased market access and understanding of demand and opportunities.
- Improved information exchange leading to a resilient beef value chain.
- Increased technical knowledge among farmers on integrating cropping and livestock forage and feed production and animal management.

- Project starting date : January 2017
- Project ending date : Jun 2022
- Implementing institution(s) : University of Tasmania
- Project Partner(s) :
  - Centre de Cooperation Internationale en Recherche Agronomique pour le Developpement - CIRAD
  - Department of Agriculture and Rural Development, Dien Bien
  - Hanoi Agricultural University
  - National Institute of Animal Sciences - NIAS
  - Swinburne University of Technology
  - Tay Bac University
  - Thai Nguyen University
  - University of Queensland
  - Vietnam National University of Agriculture
- Budget : A\$1,724,225
- Funding agency(ies) : Australian Centre for International Agriculture Research - ACIAR
- Localisation  
Country : Vietnam

State/Province	District	Village
Dien Bien		

- Area of intervention
  - Promoting agroecological systems
    - Organic agriculture
    - Agroforestry
    - Conservation agriculture
    - System of rice intensification
    - Home garden / permaculture / integrated farming
    - Integrated Pest Management / Agroecological Crop Protection
    - Crop-livestock farming systems
    - Other :
  - Supporting farmers access to :
    - Seeds and breeds
    - Appropriate scale mechanization
    - Bio-products
    - Market / Labelling
    - Land
    - Credit / Finance
    - Information
    - Other :

- Promoting environmental protection :
  - Alternative to pesticide use
  - Sustainable natural resources management
  - Resources use efficiency
  - Biodiversity conservation
  - Waste reduction and recycling
  - Use of renewable energies
  - Other :
  
- Promoting safe food systems :
  - Improving food safety quality in response to consumer health concerns (less pesticide residues, less bacterial contamination...)
  - Improving food nutritional quality
  - Setting up and promoting short and/or local food supply chains
  - Standard setting and third party certification (public and private labels) / Branding
  - Participatory certification (Participatory Guarantee Systems) / Community supported agriculture
  - Traceability / quality management along the chain / contractual arrangements
  - Processing of agricultural products
  
- Promoting :
  - Gender equality
  - Youth in agriculture
  - Cultural diversity / ethnic empowerment
  - Market / Value chain inclusiveness
  
- Improvement of advisory / training systems :
  - Development of training materials for farmers and field workers
  - Reinforcement of agro-ecological curricula in education
  - Farmer exchanges of experiences and innovations across sites / farmer field schools
  - Innovation platforms
  - Strengthening public-private partnerships on agriculture/vocational training
  - Other :

- Project activity(ies) :
  - Training
  - Awareness
  - Advocacy
  - Technical support
  - Financial support
  - Support to local entrepreneurship
  - Market development
  - Value chain management
  - Reinforcement of organizational capacities / support to farmer organizations
  - Infrastructure construction
  - Networking
  - Research / Trials

## Annex 6: Project description form – TEAL

- Name of the project : Technologically Enhanced Agricultural Livelihoods
- Project acronym : TEAL
- Documents or web page introducing the project / initiative : <https://www.care.org.vn>
- Contact persons :

Mr Le Xuan Hieu            Email: [lexuan.hieu@care.org.vn](mailto:lexuan.hieu@care.org.vn)  
 Mr. Manh An (Son La)            Tel : 0977958968

- Project presentation :

Vietnam is among top coffee exporters in the world. Coffee accounts for around 15 to 20 per cent of the country’s total export of agricultural products and provide jobs for over half a million farmers. Across the industry, however, there is a stronger focus on production and productivity rather than postharvest, quality and access to markets. Smallholder farmers, particularly ethnic minority producers, are yet to fully benefit from the export revenue and remain at the bottom of the value chain.

In the northern mountainous provinces of Dien Bien and Son La, ethnic minority women and men work hard in the Arabica coffee value chain. However, they are taking part in the production process as individual household units rather than collectively. This leads to low bargaining power, challenges in accessing inputs (such as fertiliser, seeds, or pesticides) and a lack of opportunities to jointly improve production, processing and profits.

At the same time, household livelihoods, coupled with the traditional concepts of the roles that men and women should have, make it difficult for ethnic minority women to access markets and make decisions, ultimately preventing them from gaining a strong collective voice in the value chain.

- Main objectives :
- Main expected / achieved results :
  - The contribution, role and voice of ethnic minority women farmers are respected in the coffee value chain
  - Ethnic Minority Women benefit from increased income from the coffee value chain
  - Ethnic minority women in the coffee value chain have access to formal financial services and are supported by policy implementation.

- Project starting date : 2017
- Project ending date : 2021
- Implementing institution(s) : CARE
- Project Partner(s) :
  - Dien Bien Centre for Community Development (CCD);
  - Son La Department of Agriculture and Rural Development (DARD);
  - Private coffee companies
- Budget : AUD 3 million
- Funding agency(ies) : The Australian Department of Foreign Affairs and Trade - DFAT
- Localisation: Country : Vietnam

Province	District	Commune
Dien Bien		
Son La		

## Annex 7: Project description form – Anh Chi Em

### **Mission: A social microfinance offering**

Anh Chi Em (means Brothers and Sisters), a social microfinance programme, was launched in Dien Bien, in 2007, by Entrepreneurs du Monde to support entrepreneurs with very limited income or assets, weak voice in the community or high exposure to natural disasters.

Anh Chi Em’s team call them “partners” because they consider them as key actors of the social change. To do so, ACE provides loans and savings services adapted with their characteristics, improves their social awareness, technical information and skills.

### **Methodology: The group of partners, heart of the methodology**

ACE promotes strong group ties among members, who meet on a regular basis to save money, repay their loans, take part in trainings and share skills, knowledge and information. There is no jointly financial liability among members, but instead the social link is promoted and strict rules of regular meeting, savings, group leaders election, etc., are required.

Furthermore, this structure allows both ACE and its partners to reduce transport costs and enhance their mutual understanding through frequent meetings.

### **Incubation: A solid base**

From start-up to independence, the Anh Chi Em team has been supported by the technical team at Entrepreneurs du Monde, working on nine key points: governance, social performance, strategic planning, human resources management, information and management systems, operation management, administrative and financial management, risk management, advocacy and fundraising. Anh Chi Em has reached a 118% operational viability and is now recognized as a Microfinance Programme by the Vietnamese State Bank.

### **Activity dimensioning**

ACE is currently operating in 3 districts/city with 19 communes as below:

- Dien Bien district (11 communes): Thanh Luong, Thanh Yen, Thanh An, Noong Het, Noong Luong, He Muong, Nua Ngam, Thanh Xuong, Sam Mun, Pom Lot, and Thanh Nua
- Dien Bien Phu city (3 communes): Muong Phang, Pa Khoang, and Na Tau
- Muong Ang district (5 communes): Ang Cang, Ang Nua, Bung Lao, Xuan Lao, and Nam Lich

### **Highlights: Two specific projects in craft and agriculture**

Cotton and indigo planting project in Nua Ngam: ACE has collaborated with TrendEthics to empower its partners by making their traditional weaved fabrics marketable and sold, so that they can preserve their culture while improving their income without using any chemical.

Rice cultivation project in Muong Phang: Besides, ACE has implemented a project of rice cultivation that aims to improve the awareness and practice of cultivation using pH control as a way to improve the appropriateness of land to make rice plant stronger and grow better. The project is a success. It has not only improved income for the farmers (through increase of yield and decrease of cost on fertilizer and pesticide), but also raised awareness on practices of sustainable agriculture and environment protection. In 2020, ACE will conduct waste transformation and organic cotton plantation projects.

### **Contact**

Nguyen Duong (DB) Email: [duongnguyen@anhchiem.org](mailto:duongnguyen@anhchiem.org)

### **Discussion with Anh Chi Em (Hien, Think, Duong; 3<sup>rd</sup> March)**

The main focus of the NGO is on microfinance and they work in the rural areas, hence mainly with farmers, and are focusing on supporting women (more than 85% of their beneficiaries worldwide).

They do not only provide loans and services but they also build capacity to support livelihoods, notably business and financial literacy.

They are now operating independently: the interest from the loans is covering their operating expenses. They work in Dien Bien district, DB city and Muong An. Their vision is to expand to increase their outreach to poor people, who are still lacking access to opportunities and resources.

Their staff includes 4 agricultural workers: 2 in crops and 2 in veterinary services. They work with all vulnerable people, having small scale production (e.g. 1000 m<sup>2</sup>). They mainly work with black Thai, which is the dominant ethnic group. They work under group methodology.

From 2011 to now they have managed to increase from working with less than a thousand to more than 4000 borrowers; and beyond that, farmers are also depositing savings and attending trainings. Farmer interest groups include on average about 10 members.

Farmers are working in networks of beneficiaries. They attract farmers to join training through combining it with the loan activity. And they follow up with on farm visits and on farm capacity building. = 3 ways of working that they combine: capacity building/ field visit/ networking

Weaving project: like a value chain. They have motivated a group with traditional expertise and introduced them to customers in France = Trendethics. This customer has high expectation on organic products, from the raw material to the fabrics, including dyeing material, all needs to be organic. That has created motivation to revive their tradition because of the existence of a demand for it. Weavers from the groups were already producing organic cotton but it was not enough. They got seedlings from Ninh Tuan province, with seeds that were initially given for free to the weavers. They are also recovering their techniques for using indigo leaves and other natural dyes and all is produced hand made with traditional techniques. They are also connected to a Canadian NGO to develop the group marketing skills so that they do not depend on Trendethics. A comprehensive training on marketing has been done last year. ACE is supporting the group to become a cooperative.

Possibilities for developing the weaving project are restrained by the lack of interest of the ethnic groups in their traditional products at the moment. They prefer to buy cheap products from the market as own fabric production is considered as too time consuming. Only a group of 7 women farmers who are Lao people have been willing to engage with this project. They are producing cotton on a 800 m<sup>2</sup> plot. They have organized an exchange with artisans from Lao Cai with very good skills in dyeing indigo. They are still receiving support from Trendethics for training on the importance of organic planting and dyeing.

Regarding rice cultivation, they promote the use of limestone by farmers to achieve an appropriate soil pH and help the rice plant to grow stronger, and hence rely less on chemicals or pesticides. Sometimes however, they still need to use chemical fertilizers. They work with 30 farmers in 3 groups. They ensure a lot of follow up. They work with groups of people doing the same thing in the same village. SSF are still using the techniques after the project ended its support regarding lime. SSF have been connected with traders to buy lime and worked as a group. One of the agricultural worker from ACE with good knowledge on crop production has been the one promoting the use of lime. They hope to get a grant from the US embassy to replicate this model. The support is organized over the duration of one season. They worked first in Muong Thanh in 2019. In 2020, they worked in 2 places.

They are also developing a project on waste transformation with 60 farmers. However, Covid situation is making it more difficult with regarding finding inputs, at least at an affordable price. They are recycling manure from buffaloes. Initially they were considering using gasifiers to transform waste into energy for cooking but it was not energetically efficient. It required to use a machine which is consuming a lot of electrical energy. Now they are using vermicompost with red worm to transform the manure and they then use the worm as food for poultry. They exchange with the agricultural extension service on this. For this project, they are operating in a new commune area which has problem with manure while having sufficient amount for transformation. The first phase of this project

is over the year 2021. Next year will be to expand. They have an agreement with the people's commune committee to provide training and spread resources to more people in the commune to get them to understand the benefits. ACE will not have to pay for this second year phase.

In addition, last year they identified that farmers were not valorizing the maize plants after harvesting when not used fresh and that they were burning them. Hence, this year they are starting to train farmers on how to produce maize silage. For this they have asked advice from a technical assistant from EDM and an expert in DB.

Regarding the expertise to provide technical advice and develop new projects, Lucie from Trendethics is a key partner. As an environmental engineer, she introduced a lot of models and is providing scientific knowledge (notably on waste transformation). They are also benefitting from the expertise of EDM.

Regarding the selection of groups, they have a set of criteria. They first communicate about the project in pre-targeted communes; villagers can then apply and they identified the beneficiaries using their set of criteria. They do not need to discriminate positively women but still work with women at a rate of 84% as the loans are small and require to commit to monthly meetings. Men are thus less interested as they have more opportunities to access credit. Furthermore, usually women cannot hold big amount. Small amounts make them more confident.

In terms of cooperation with agricultural extension center, they ask for support to deliver trainings. Overall, they are working with 200 solidarity groups and 2 crop production agricultural workers is not enough to offer support to all these groups. And it is not easy to recruit staff which have social goals (currently actually only have one agricultural worker left). And only when they have grants, they manage to work with agricultural workers from the communes and provide them with allowances.

A significant number of SSF beneficiaries for the loans are working with chickens and pigs though currently, there are concerns regarding ASF. These small animals provide higher profitability and are suitable to the loan capacity as the loans are very small. They can combine these loans with others.

In DB district, needs for loans are mostly for animal husbandry, notably poultry. Muong An district is not as diverse as DB district in terms of crop production. Therefore, the needs for loans is smaller. SSF are mostly producing rice for self-consumption and productivity is very low. Needs for loan may be with regard to coffee and other industrial crops as well as edible cana. For rice, loans can be used to flatten the fields and for fertility improvement. Cassava is another crop in Muong An because of the presence of a big Chinese factory which is producing cassava powder (very polluting).

The range of loans goes from 1 million to 10 million VND and for a period from 3 to 12 months. Farmers can access to higher amount progressively, cycle by cycle. ACE is going to open a 20 million VND loan for a maximum period of 18 months, which will be more suitable for cattle and buffaloes. 24 month period is too risky.

ACE works with 17 credit officers who cover 1 to 2 communes each and work directly with the SSF, not through the local authorities. They just sent the list of beneficiaries to the local authorities.

They are experiencing very few problems with recovering the loans (i.e. 0,5% of the beneficiaries have not paid back after a delayed period of more than 30 days). These beneficiaries are they considered at risk and they are categorized into 4 groups according to their willingness and capacity to pay and they take different actions accordingly (following EDM guidelines).

In Vietnam ACE is the only program of EDM.

Together with the loan operations, they also work with farmers so that they deposit at least 30000 VND month on a ACE account when they join group meetings. Last year, many farmers were desperate with agriculture in DB and migrating to other provinces (notably to work in the construction sector), with issues related to human trafficking. ACE is intending to support people to again gain faith in



agriculture for making a living. Covid time is considered as a good time in this regard as people are stuck in the region and this provides more opportunities to bring back confidence in agriculture.

On a small scale, when ACE knows that farmers producing organic are facing problems with market (through staff reporting it), they try to visit the farmers and to publicize, through photos..., the farmers' available supply within their small local network of people looking for organic products or they directly buy from them (= ACE 'market'). They are sharing the info with their local network of possible consumers in a very informal way and are looking for support in widening their network.

In total there are 40 staff in ACE including the 17 credit officers, the 4 agricultural workers and on social workers as field staff.

One of the farmers in their loan program is a member of the Tal Sang cooperative (Hana coop) but they do not have formal cooperation with the cooperative.

They are looking for support also on agronomic technics to move toward organic practices.

Any person who is to benefit from ACE loan as to follow the 5 modules of training on financial literacy provided by ACE before becoming a member. While ACE had not implemented this policy with old group, it is now enforcing this for the new group formed to receive loans. Then, groups can benefit from training on how to determine price, limit unnecessary spending and increase profits. They are also planning to provide training on marketing skills for all, based on training designed by EDM. Some trainings are specific to some projects such as the training on marketing delivered by ArtistriSud which is very intensive and includes a lot of practices.

ACE is also organizing ToT for its credit officers and then, during every meeting in the new branches, they will provide some trainings. In old branches, the focus is much more on credit while in new branches, some farmers do not even take loans and training has been improved.

In general Thai people tends to pay back loans better. Kho Mu are more working in groups but with more mimic behaviors which can include negative sides such as higher risk that if one is not paying back, others will copy and tend not to pay back also. They may also decide to apply for loans because they see others doing it without effective needs for this. On the other hand, if leaders join the group, they will attract more people in the program.

Overall in the region, the awareness over pesticide and chemical product use is very low, even for the agricultural workers that they work with. EDM is providing training to beneficiaries about the benefits of natural pesticides and fertilizers and how to use them.

Other NGOs operating in the region: World vision but they have not yet identified official collaboration deemed appropriate and Blue dragon is specialized in human trafficking which is very sensitive issue.

Else they cooperate with YSEALI = Vietnamese Alumni from the US state department.

Overall beneficiaries from the credit program have expressed their satisfaction in the survey undertaken by ACE but they would like higher loan amount, notably to invest in big livestock and fish.

However, ACE cannot expand its program at the moment as it cannot take loan under the Vietnamese law with its status as a non for profit organization. Hence, they have to depend on grants and these are difficult to access now that Vietnam has changed of status. They would like to change of status to become a microfinance institution. They also suffer from an outdated system for managing their loans and the information under the different systems cannot be integrated. Therefore, it is difficult for them to have real time information. They would like to move to a cloud based system with client Apps, for them to check easily. Their system upgrading costs 30.000 USD and currently they have only gathered 18.000 USD.

Many farmers are illiterate in the region, hence developing Apps makes sense but these should include videos... These need also not only to provide information but also to help connect people together.

## Annex 8: Project description form – InfoAct

### **Information for adaptation in Vietnam (InfoAct)**

Vietnam is among the few countries that are most prone to climate change and natural disasters, which range from storms and floods to droughts. When such events occur, poor ethnic minority people in rural and remote areas, especially women, will suffer the most. While increasingly recognising changes in weather patterns that adversely affect their livelihoods, farmers largely lack the capacities and tools to gather and interpret climate information in a way that they can adapt for more effective prevention and increased resilience. They also lack access to resources and social protection mechanisms that could help them cope with climate shocks. As they mainly live on agricultural farming, it means that it is extremely difficult for poor people to move up in the income ladder while easier for those who are near poor to fall back under the poverty line. Through InfoAct, CARE works to strengthen the livelihood and resilience of poor ethnic minority women and men in rural areas to climate change and climate shocks by improving their access to and use of climate information and resources such as insurance.

### **Key expected outcomes**

- Strengthened capacity of service providers and users to produce and to interpret and apply climate information.
- Increased ethnic minority women and men' access to relevant climate information.
- Improved social protection and climate risk insurance coverage for ethnic minority households through Village Savings and Loan Associations (VSLAs).
- Improved coordination mechanism for climate information and climate risk micro-insurance system.
- Increased capacity of local partners to develop understandable downscaled climate information and advisories, thus better supporting local farmers in articulating their climate information demand with local authorities.

### **Direct and indirect participants**

~10,000 ethnic minority farmers Government authorities & service providers

### **Locations**

Dien Bien and Lai Chau provinces

### **Co-implementing Partners**

Center for Community Development (CCD) Lai Chau Department of Agriculture and Rural Development (DARD) Lai Chau Women's Union (WU)

### **Timeframe, budget and donor**

May 2018-April 2021

1.5 Million Euro The German Federal Ministry of Economic Cooperation and Development (BMZ)

### **Contact**

Ms. Tong Thi Huong

Vice director

Centre of Community Development (CCD) Dien Bien

Tel: 0982.870.144

Email: tonghuongdb@gmail.com

## Annex 9: List of the stakeholders met and field visits during field mission

Date	Time	Activities
Monday 01/03	am	Meeting with Joint stock Dien Bien Agriculture Service Company (seeds, rice, tea...) Visit local buffalo meat drying workshop
	pm	Meeting with TEAL project Meeting with InfoAct project Meeting with UVA Company (Macadamia and livestock) Visit Dien Bien Agricultural extension Center
Tuesday 02/03	am	Meeting with DARD Dien Bien DG and following departments: veterinary, irrigation, rural development, quality management, plant protection, statistics, DONRE, DOIT, Land resource management, plant production (sub-groups meeting)
	pm	Visit Coop N°17 (NSTP Mường Thanh), safe agricultural products Visit Coop N°18 (Nông sản Hữu Cơ Điện Biên), safe vegetable and meat Visit Coop N°33 (NN Công nghệ cao RAZA), rice Visit Thanh Yen Agricultural Service Cooperative (Hana) in Thanh Yen Commune
Wednesday 03/03	am	Meeting with agriculture services Dien Bien district (DG, agricultural service center, statistics) and other organizations: farmers union, DoNRE, ACE project
	pm	Visit Dien Bien Import - Export Trading Joint Stock Company (organic fruits, vegetables and Tam Do Supermarket) in Thanh Yên Commune Visit Mien Dong Loc Bien production (OCOP) in Thanh xuong Commune Visit cooperative and field Safe vegetable Pom Lot in Pom Lot Commune Visit farmers beef cattle project (forage maize, cattle fattening) Visit ACE project beneficiaries (cotton weaving) in Sam Mun Commune Visit Dien Bien Honey Cooperative in Sam Mun Commune
Thursday 04/03	am	Meeting with agriculture services Tuan Giao district and other organizations (DoNRE, farmer and women unions, agriculture service center, statistics department) Meeting with Macadamia Dien Bien Company Meeting with Fish cooperative
	pm	Visit farmers field AFLI II project (AF coffee) in Toa Tinh Commune Visit farmers field Breedcaf project in Toa Tinh Commune Visit Nhat Long Cooperative on coffee and livestock in Quai Nua Commune Visit Macadamia Company production farm in Quai Nua Commune

## Annex 10: Notes meeting with DARD Dien Bien Province and other organizations

### Participants

N°	Name	Institution	Position	Phone Nb
1	Nguyễn Thị Dung	Dpt of Agriculture	Expert	0988135295
2	Lê Văn Hiệp	Dpt of Natural Resources and Environment	Head of the admin division	0974935374
3	Phạm Xuân Hưng	Industrial and commercial facilities	Deputy Head of Dpt	0915560125
4	Lò Văn Tại	Veterinary Dpt		0912974818
5	Nguyễn Đình Ký	Dpt of Science and Technology	Deputy Director	0912667237
6	Phạm Tư Giáo	Dpt of Statistic	Deputy Director	0917797096
7	Chu Thị Thanh Xuân	Dpt of Agricultural and Rural Devpt	Deputy Director	0912040718
8	Nguyễn Thị Phượng	Dpt of Agricultural and Rural Devpt	Chief Office	0919929578
9	Trần Sỹ Quân	Dpt of Agricultural and Rural Devpt	Deputy Head of Dpt	0919954116
10	Bùi Văn Long	Center for Agricultural Extension of Plant Variety	Deputy Director	0988368235
11	Vũ Thị Hương	Dpt of Agricultural and Rural Devpt	Expert	0988052005
12	Phạm Thị Hoa	Dpt of Agricultural and Rural Devpt	Expert	0932343112
13	Nguyễn Đình Dũng	Veterinary Dpt	Head of Dpt	0975082127
14	Bùi Ngọc Sơn	Dpt of Plant Protection	Deputy sub-Dpt	0917623155
15	Hà Thị Thúy	Quality Control Dpt	Deputy Dpt	0839086126
16	Trịnh Thị Hồng	Dpt of Livestock	Expert	0838699888
17	Nguyễn Thanh Bình	Dpt of Rural Devpt	Deputy Sub-Dpt	0918131447
18	Nguyễn Thị Nguyệt	Agricultural	Expert	0912302030
19	Nguyễn Thị Hằng	Livestock and breeding	Head of Dpt	0983159036

### Overview

Total Province area: 950.000 ha = more than 30% agricultural land and same for forest. Checking land area not used yet to see how to develop for the private companies.

Climate/ Weather: dry monsoon, max temperature 37 degrees, around 17 degrees in the winter. Dry and raining seasons. Rainy season: from May to September. Specific weather = foggy and hurricanes; very cold in mountainous area with wind from Laos in winter

Population = more than 601,659 people. Only 14.39% urban area, 63.06 people/ square km

19 different ethnic groups (Thai, Mong, Kinh, Kho Mu, Dao, Lao, Khang, Ha Nhi, Hoa, Xinh Mun, Tay, Cong, Nung, Muong, Tho, Phu La, Si La, San Chay and others). The majority is Thai with 38.9%, following by Mong (34.8%). High % of ethnic groups seen as a difficulty.

Total laborers (> 15 years) is 352,632. Average income is nearly 1,6 million VND per capita.

33% poor in 2019 according to the poor standard for the period of 2016 to 2020. GDP increased nearly 5% in the last period. 19.000. billion per year. 32,36 millions = 1385 USD

### Crop Production

**Paddy rice:** the province has about 30,000 ha of paddy fields: ~9500 ha (52,000 tons/year) of spring rice and ~20,000 ha (104,000 tons/ year) of summer rice. Objective of intensive cultivation to meet the food security of the Province. Aim for 1/3 of the area to produce high quality rice fragrant rice varieties and local varieties) to sell to big markets like Hanoi. Process change to achieve better quality

of rice: switch to organic farming (using organic fertilizer) and apply improved rice cultivation methods SRI (to decrease the pesticide use).

**Upland rice:** there are more than 20,000 ha of upland rice by remote farmers in service of areas where wet rice cannot be developed. In recent years, it has been difficult for climate change to grow upland rice (low productivity). They ask farmers to switch to fruit trees and grass production. In some areas, there are new rainy crops that can be cultivated, others must be abandoned.

**Fruit trees:** develop citrus trees, orient not to go into a specific tree, but according to the needs and the demand of companies and variety of fruit trees (short-term, long-term).

**Maize:** more than 29,000 ha under maize (~337,000 tons/year), mainly on sloping land which is difficult to cultivate. There is no orientation to develop maize on sloping land, only to encourage planting in 15ha of alluvial land with sloping land to develop fruit trees.

10 years ago, they applied intercropping with maize and grass (forage, legumes etc) and mulch. There was many options to cultivate on slope land through sustainable ways. But the investment was very high, especially labor, and the maize price is still low. This model of sustainable maize has no economic efficiency currently as low price of maize.

**Rubber tree, tea and coffee** as main cash crops.

**Rubber:** 5,104 ha; yield of 3,037 tons

**Tea:** 611 ha (with new grown area of 14 ha); 68 tons of fresh shoots

**Coffee:** 3,330ha, 2,804 tons= Muong an and Tuan Giao districts

**Macadamia** = more than 3000 ha (3,229 ha); mono cropping of 2,687 ha, and intercropping of 557 ha

#### Livestock

Mostly buffaloes, cows and pigs. One of the 10th provinces with the largest stocks and among the most important population of buffaloes (136,438 heads); cattle (81,240 heads); More than 300.000 pigs, 4.5 million poultry.

Connection with CP to develop pig production for high quality and food safety

Aquaculture = little area, 2,630 ha; 3,852 tons (Tilapia mainly, small production of salmon)

#### Forestry

Forest cover = more than 42%. Plantation = 194 ha.

#### Farm and farmers organizations

Cooperatives: total of 162 coop in the province in 2020, on which: 32 agricultural cooperatives and 32 others stopped operating in 2021.

Commercial farms = 37 according to MARD standard, in which 19 cropping farms; 3 livestock farms; and 15 mixed farms. Actually more than 100 but only 37 for the new standardized registration

#### Market and marketing strategy

Market in the province still small. Only 3 central markets in the province. Small markets with poor infrastructures.

Commercial production is still limited, still small scale production, but ambition to increase exports, notably for rice. Dien Bien rice is famous but issue related to branding. Rice sold as Dien Bien rice in other provinces is often not coming from Dien Bien.

Try to support farmers engagement into VietGAP. More than 100 ha of vegetable, fruits and rice under VietGAP. Demonstration farms for Viet GAP mainly focused on quality rice in Muong Thanh, 1800 ha. Some traceability for rice, tea and coffee.

23 food/value chains to supply food within the province and also to others, mainly Hanoi and surrounding provinces. But only 20 working effectively, the 3 others already stopped. Not yet get high quality and branding for products. Difficult to control the quality of the products.

VietGAP criteria issued by department, also local criteria but implementation still weak due to lack of resources.

Support farmers in agricultural production but with very limited capital = only 20 billion VND / year for the whole province regarding agricultural production

Strategy to move into organic farming in the future for restructuring agriculture in Dien Bien for 2025 to 2030. Some models also to develop agricultural production in net houses.

### **Small group discussions**

#### ***Discussion on markets and quality management***

VietGAP: collaborate with institutions in Hanoi (private certification bodies which are accredited, do not remember their names) for the certification. Certification is operating for tea business = organic and VietGAP

The main difficulty with VietGAP and organic is that it requires much higher quality, you need to have storage and to do record keeping. It is very difficult for individuals to follow the requirements and get the certification and this implies a much higher investment to follow VietGAP, including the cost for certification and training, quality testing. And it is hard to compete with people following conventional practices. Though products are differentiated with QR codes and stamps, the market price is not much higher.

Forming groups for collective certification is not really since as an option as the production area of agriculture is quite fragmented and hence, not easy to control.

Cooperatives: resolution 45: support for VC: linking farmers to businesses to find markets for products, also for processing.

DARD is trying to help farmers to form groups and cooperatives. Some cooperatives exist (e.g. for green tea in Tua Chua) but the scale is small.

2 VC linking small scale farmers (SSF) with businesses 1) through support with breeds and feeds and securing outlets and 2) providing safe food.

Local businesses for crops and livestock, focusing on local markets.

Purposes of VC support: 1) improve the value of the products, 2) find markets, 3) Improve exchanges between province and other provinces

When linkages between producers, processors and retailers through VC support are effective, the province is delivering a recognition (different from a certificate).

The benefits from this recognition is that VC actors can then attend market festivals to introduce their products. And they receive support for stamps and for promoting the quality of their product (safe, good).

20 VC: mostly rice; safe food → dry beef and pork (2 VC); also for coffee.

Promotion is organized in different provinces, not only Dien Bien but also Hanoi.

OCOP: coffee, macadamia. 35 OCOP in total: 4 with 4 stars and 31 with 3 stars

Have the largest valley for producing rice in the Northern region: make the rice different: because of the temperature and the wide ranges of altitudes.

They are promoting these products through the OCOP strategy but the small production area makes it not easy to meet the volumes.

Only one GI: for a variety of rice = Bac Thom Not.

Markets for products from supported VC are mainly in the province because of problems with appearance of the products and of cost of transportation. Festival markets: do it for dry pork or coffee = the ones which are easy to preserve.

The different VC are not yet fully established.

Festival markets are a major channel. Building brands for supermarkets requires a lot of investment.

Online shopping is also explored but it is difficult to control quality and producers are not interested in this channel. It is hard to get money back to reinvest in production. DOIT have been supporting online shopping since 2021 through websites. More than 100 websites have been established but that does not work. When no benefiting any more from support, actors do not maintain the website. It is mostly used for introducing products but not for actual sales.

Also helping producers selling online through online stores such as Tiki, Lazada, Sendo but there are still many difficulties to promote products through these online stores. Producers need to meet a lot of requirements.

Overall, a major difficulty is that the scale of production is very small.

Regarding pesticides, regular checking of pesticide uses is being done. The deputy head of DARD confirmed facing some problems in this regard.

Consumers are concerned about overuse of pesticides. They try to control the problem and provincial and district level. VietGAP and 'an toan' (safe) are considered as the most effective solutions.

According to the person from DOIT, no strategy to export to China is in place because the volumes are very small and there is no official border gate with China (only with Laos). To Laos, many industrial products are exported.

No statistics on local consumption versus 'export' to other provinces regarding rice but probably not much is 'exported'. Overall, they estimate that the majority of the production is consumed in the province.

They moved into a strategy to reach other provinces with their production because now they are meeting the requirements for the local food demand. They notably target coffee and tea. They just started with macadamia.

The policy to support linking cooperatives with businesses only started 2 years ago. Currently, they are starting organizing VC. They try to form farmer groups and solve all the VC steps but there are not yet many groups.

They sell UTZ certified coffee to other countries but again the volume is low so far.

Overall the priorities in the strategy are:

- 1) Rice in Muong Thanh
- 2) Raising cows and integrate with tourism: promote dry meat, also other products made from horns, skins etc.
- 3) Develop fruit trees and forest economy (big timber and medicinal crops under forestry landscape) on sloping lands

Historical tourism in relation with France. Building roads along rivers and also building markets. They are also planting flowers (roses from France) in cooperation with AFD.

Regarding biodiversity and landscape: they are building an airport and supporting agricultural tourism to explore the culture and experience activities in the local area (riding cows, ploughing, etc.).

Relation with CP company: CP provides breeds and feeds and will cover the labor cost (when paying for the pigs): they are outsourcing pig raising to small farmers = contract farming (also have a farm in Muong Thanh). CP is also sending technical experts to the field CP operating in the region since 5-6 years already. Contracted farmers did not experience problems with disease. SSF must meet specific requirements to work with CP.

Strategy in working with different ethnic groups: lots of government support to overcome poverty. Support to develop infrastructure for agricultural production. Promoting the different culture through tourism but issue with languages. They are involving people from ethnic groups to work with DARD. They also have programs under ethnic group languages to transfer information.

Networks of markets: 38 markets until 2019. In city town, no wholesale markets, only markets for consumers and meeting the requirements. They will build a wholesale market in Tang Minh commune for agricultural products only. They are calling for investment from private businesses besides government.

According to deputy head DARD, there are two types of consumers: 1) high income class ready to pay for branded products; 2) other who are not caring about brands.

The retail sector consists of 2 retailers in the city, which are local brands: one is selling its own products and importing seafood. Big companies are investigating the situation to open their branch here but not yet present.

The VC presented as the 4th in the doc given by MARD is maybe the one that can be considered as the best as it follows all the requirements.

Since 2018, the province shifted from focusing on producing enough for self-sufficiency to develop the production area, and OCOP comes as a result of this shift in policy. An illustration of this is planting grass to raise livestock, and biomass maize, and with a vision on where to sell the cows. In the past the focus was basically on growing the cows under free grazing in the province. Cows could without noticing. Now, they know how to sell effectively buffaloes and they pay for education feed. This constitutes a major transformation.

As part of the extension system, there is a lot of efforts on changing farmers' perception. Many different programs exist to support SSF.

### ***(Other) Discussion on Production groups/Production priorities***

Rice is the main crop, ensuring food security and commodity products.

There is more than 300,000 ha of available land with great potentials and priority for industrial trees and fruit trees development (coffee, tea, fruit trees, macca tree- multi-purpose tree) and short-term crops (vegetables). However, Điện Biên province is not competitive with other Provinces regarding to vegetables, due to the geographical distance of the province.

The province has a policy to support and shift from food crops such as Maize and cassava, to fruit trees on the slope lands. The province issued Decision No. 45/2018 / QD-UBND (see appendix 1) on the policy to support the development of agricultural and forestry production to restructure the agricultural sector in Điện Biên province. Department of Agriculture advises to build agricultural extension models.

### ***How to manage the impact of tree development on grazing area and livestock production?***

The province is developing production forests (rubber, macca), so the grazing grounds are increasingly narrowed, so the orientation of raising large cattle is to be kept in pen. Take advantage



of grazing under forest canopy if the animals are herded, and reserve part of the available land around the homes for forage production.

The forage grass currently has about 800 ha, meeting 30% of the demand for green forage for cattle. The DARD organizes training and communication to support farmers to store and use rice straw and other agricultural by-products (corn stalks, legumes, cassava leaves) to feed cattle.

How to handle manure from grazing to captivity? Is there a direction to organic fertilizer production?

The agricultural extension staff instructs farmers to produce compost at farm level to fertilize their cropland, and currently does not have enough fertilizer sources. There is no company producing compost. Currently, people mainly use chemical fertilizers. The coming plan of the Province is to concentrate the livestock production, with high integration with fruit tree planting (Macca + forage and a specialized commercial cattle farm).

Concentrated livestock, the problem of disease risk will be higher?

Concentrated livestock only for pig production. After the outbreak of African Swine Fever (ASF) the biosecurity is the most important and first solution (procedure for feeding, sanitation, and registration of the procedures and practices for animal husbandry).

For the large animal, kept the animal in pen and apply waste treatment technology (composting, biogas, separation liquid and solid part).

How to maintain a good price for the fruit if the production and the area increase?

Macca production belongs to a large group who manage the market access and the price. It's not the same for the other fruits. Decision 45/2018 attracts businesses to invest in the Province from purchasing and processing agricultural product, and develop short value chain, including supply and management of the Market. Currently there are businesses invest up to 200ha. Cooperatives with 10-20 ha are.

OCOP (Mr Nguyễn Thanh Bình)

2019-2020: 35 products including 31 agricultural products: tea, rice, vegetables, coffee, honey... There are 29 products with 3 or 4 stars.

Specific guidance for these products to improve the quality and the quantity of the product and meet the market demand. OCOP certified by the Province and managed by the Agricultural service center (support training etc).

Plant protection and chemical use (Mr Bùi Ngọc Sơn)

The local officer goes to the field to investigate, evaluate, and detect pest and disease. Weekly, they develop notifications, and a report from each district. The agricultural extension staff directly checked and guided the farmers.

The information transferred through many channels: through loudspeakers, bulletin boards in the cultural house in the villages, in addition to demonstration models, then invite farmers in different regions to exchange and learn. Through inspection and examination channels: specialized agencies at district and commune levels have checked the use of plant protection drugs locally, propagated and instructed.

Do farmers apply correctly the chemicals? The 2 last years, in the concentration area (paddy field) most of the farmers follow the procedure in the use of chemicals and recognize main pest and diseases. In the remote area, farmers use herbicide in short term crop in slope land, wrongly and overdose, without any plan, due to limited awareness.

Pest management IPM has been deployed for many years (15-20 years) very strongly, later on, own funding is not available. The province issues an IPM plan every 5 years.

Orientation to use probiotics, bio pesticides and trap?

There is policy orientation and technical norms, to guide the use of bio pesticides (priority for organic fertilizers) and to reduce the chemical source in the annual production. There is an expectation at Provincial level to decrease the number and the amount used of chemical pesticides, and to increase of biological origin products. The province's mass production still regularly inspects and directs the recommendation of replacing chemical products with bio-products.

The models: using green mushrooms to manage rice pests and aphids, with collaboration with private companies and research centers (such as FAVRI) that already have procedures for handover

How to monitor the use of pesticide? Every year, the Department of Agriculture and the plant protection department manage the trade of pesticides and assess the use of chemicals with i) a control of buying and selling of chemical products; ii) the amount of chemical products imported into the province; iii) data from intensive farming system.

How to increase animal feed to support livestock production if the grazing area decrease?

The animal could graze under the forest during the first years after the plantation. Later on there is not enough light. The DARD support the development silage from cattle production. It's mentioned in the Provincial development plan 2021-2030, based on the results of Beef cattle project.

They encourage organizations and individuals to introduce new grass varieties for experimentation and for the most suitable, a diffusion. JICA introduced Guatemala grass (suitable for cold and dry weather) in Tuan Giao and Dien Bien. The most popular forage grass are VA006 (high yield Elephant grass) and Guinea grass. They are not using forage tree to feed the animals. Leucena is used to provide shadow to the coffee in the remote land (not economic to bring back the leaves at home to feed the animals).

**Short discussion with the director of DARD**

Organizing the agricultural transition from early stage to avoid some traps that have been encountered by those already more engaged in the transition (such as Son La Province).

Importance of understanding the current situation including both its advantages and disadvantages and get proper information for that → openness to provide data for this including practices and behaviors, and they will combine between departments to cooperate.

They had a big JICA project (2005- 2010) during which a scoping study was also done (but no copy of the document).

## Annex 11: Notes visit Coop N°17 (NSTP Mường Thanh), safe agricultural products

Interviewer:

- Mr. Giang - 0982173625

- Pham Ngoc Khai – 0344736118

### **Dien Bien ecological farm cooperative**

The cooperative was established in 2016 at Ban Me, Thanh Hung commune, Dien Bien district. The cooperative has 12 members. The cooperative has a land area of 1 ha. In 2020, the new cooperative leases an additional 5 hectares of land. In the newly hired 5 ha cooperative to produce vegetables, build a 3300 m<sup>2</sup> greenhouse to produce high quality vegetable products. In the near future, the cooperative plans to raise more safe and specialty chickens.

The cooperative was established with the idea of realizing the potential of providing clean products for the school system in Dien Bien province.

Products of the cooperative: vegetables, tomatoes, cucumbers, cabbage, pork.

The cooperative aims to produce clean and safe products for boarding and boarding schools in the districts of Dien Bien province. Currently, the cooperative is supplying vegetables and food to about 40 schools in two districts of Nam Po and Dien Bien Dong. The number of these schools only accounts for 40% of the total number of schools in the two districts.

The cooperative delivers goods to schools on average once every 3 days because the schools are quite far from the cooperative.

The output and product range of the cooperative is not enough to supply 40 schools, so the cooperative has to cooperate with 3 other cooperatives to buy vegetables and food to put into the cooperative's supply system. Currently, the cooperative can only meet 40% of the output. Cooperatives signed contracts with schools and signed production contracts with 3 affiliated cooperatives. The cooperative plans production to ensure the output and products meet the requirements of the schools.

Supplying food to cooperative schools must ensure quality, food hygiene and safety requirements. Members of production cooperatives must comply with the requirements of isolation and use of fertilizers of the cooperative to ensure quality.

The cooperative is supported by the province to certify VietGAP for an area of 1 ha granted by Grape Grape Company to produce vegetable, tuber and fruit products. The certification is valid for 2 years and the annual re-certification cost is 20 million/ha. Cooperatives associated with cooperatives do not have VietGAP certification.

With an area of 5 hectares newly rented, the cooperative produces in a safe direction, without VietGAP certification. In the coming time, the cooperative will not have a direction to certify VietGAP because there is no request from the market, the cost of certification is relatively high. According to the cooperative, the cost of certification is about 20 million/ha.

The cooperative has not yet organized organic production and in the near future does not intend to produce according to organic standards.

The province only supports VietGAP certification for cooperatives. In addition, the cooperative has not received any other support. When doing VietGAP certification, cooperative members have been trained in production techniques and VietGAP standards.

Cooperative development orientation:

- Continue to expand food supply for the school system in Dien Bien province.

- Continue to expand the production of vegetable, fruit and meat products.
- When expanding the market, cooperatives will expand production or associate with cooperatives.
- If receiving support, the cooperative can raise more chickens with a scale of 20,000 chickens. Including 10,000 broilers and 10,000 eggs. Use earthworms for farming.
- Admission of new members to the cooperative, however, members must ensure compliance with the cooperative's requirements.

### **Production model in the greenhouse of the cooperative.**

In 2020, the cooperative invests in building 3500 m<sup>2</sup> of greenhouses to produce high-tech vegetables. The total investment cost is about 1.1 billion VND for the greenhouse and drip irrigation system. Drip irrigation systems can combine fertilizing, using soluble fertilizers. The new membrane house will come into operation around the end of 2020.

The technical consultant for the greenhouse construction cooperative is the Nguyen Dynasty Company in Da Lat. During the production process, the cooperative received advice from the Agricultural Academy 1.

In the greenhouse, the cooperative is producing baby tomatoes and cucumbers. All products are sold to traders and people in the area. Due to high quality products, high prices should not be supplied to the school system. The selling price of products grown in greenhouses is 2-3 times higher than normal products. The selling price of cucumbers in the garden is 25,000 VND/kg, tomatoes 20,000 VND/kg. Despite the high price, the current output of the cooperative has not met the market demand.

Tomatoes and cucumbers are grown on a substrate made of coconut and soil. The price can be reused within 2 years. When discarded, the substrate can be mixed with the soil to make fertilizer for plants.

Currently, the cooperative is hiring 10 employees to work regularly for the cooperative.

In farming, cooperatives use Nano silver products to treat soil and spray crops.

### **The model of Mr. Khai's livestock farm**

Farming model at home

Breeding activities: Raising meat rabbits and breeding rabbits, raising chickens and eggs, raising pigeons.

#### **Pigeon breeding**

The household started raising pigeons from 2017. The pigeon breed is a French pigeon imported from the Central Seed Company. At present, households can self-propagate to sell and raise meat. Products supplied for the system of restaurants, wedding parties in Dien Bien province. Pigeons rarely get sick.

#### **Rabbit breeding**

Currently there are a total of 700 rabbits including meat rabbits and breed rabbits. Initially, the household imported breeding rabbits from the Son Tay Rabbit Breeding Research Center. After that, the households breed themselves to raise meat and sell the baby rabbits. A common disease of rabbits is scabies. If the food source is not guaranteed, the rabbit may have diarrhea.

## Annex 12: Notes visit Coop N°33 (NN Công nghệ cao RAZA), rice

### 1. General information about the cooperative

- Cooperative was established in 2020 with 8 members but the land planning and production began from 2016.
- The location of its production area is in Bung Lao commune, Muong Ang district
- The area of the cooperative is 400 ha, of which the cooperative owns 300ha, 100 ha around the cooperative's area are of farmer households who are associating with the cooperative to develop this model.
- Chartered capital of the cooperative: 20 billion VND.
- Currently, the cooperative has just invested in electric system and irrigation system. The cooperative will begin to increase the planted area from 2021. The cooperative planted 70 ha of oranges and pomelo.
- The cooperative hires experts with many experiences in citrus trees from service companies in Hanoi to develop the production (HUST – Hanoi university of Science and Technology).
- The cooperative is still hiring machines to process products, make kinds of fruit condensed juice.

#### *Goals of Cooperative:*

- Landscape afforestation (beautiful forest): Hoa Ban, peach-blossoms.
- Growing fruit trees.
- Indigenous plants: Medicinal trees
- Develop the agricultural production combined with tourism.
- Process products: Produce the concentrated juices: Orange, sugarcane, pomelo, fruit wine
- Cooperative links with local people to develop the production: Cooperative provides techniques and seedlings for producers.

I also have 2 areas of agricultural production:

- Ha Phong cooperative in Hòa Bình province with a area of 500ha, growing orange. I cooperated with Hanoi University of Science and Technology and the Medicinal Plant Research Institute to create 8 OCOP products in Hoa Binh province. Ha Phong cooperative is applying DEVA technology which allows to maintain the original flavor of the fruit in concentrated juices. The concentrated juice products of Ha Phong cooperative have been exported to 17 countries around the world. And the cooperative has also 5 types of fruit wines.
- I have a 30ha farm in Thanh Ba district, Phu Tho province that achieved GlobalGAP certificate.

### 2. Reasons for cooperative establishment

- Want to develop the economy of Dien Bien.
- Local people lack science and technology, lack new fruit varieties.
- Cooperative is an economic model closer to the farmer.

### 3. Why do you want to develop agriculture in association with ecotourism

- Trendy: High market demand for this model, people in the city living in a stuffy environment, they like to visit the countryside.
- Visitors will buy products of the cooperative at a higher price → Increase profits, increase product value and generate good cash flow.

### 4. Plan of Cooperative

- Stabilize production areas, invest in road and electricity infrastructure. Then we will expand the production area, promote communication, but when cooperative has final products. We will do these things in the next steps. Currently, the cooperative focuses on production at the beginning phase.

- Doing agriculture combined with tourism to ensure cash flow. If it only depends on one crop or livestock, it is easy to fail when crop failure. That is why we do agriculture combined with tourism. Thai people is a main community here and so when doing agriculture with tourism, there must be indigenous culture, Thai culture such as Thai xoe dance, Bamboo dance (múa sạp) and Thai dishes.
- To do eco-agriculture combined with tourism: The cooperative will hire a group of experts from Hanoi (the leading expert is from the Hanoi University of Construction) to build this farm.

#### **5. Use pesticides and fertilizers in cooperative**

- Cooperative is using organic pesticides, organic fertilizers, biological products. The cooperative has experience in ecological agriculture from a farm model in Phu Tho that has achieved GlobalGAP.
- Biological products: Cooperative used chili, lemongrass, garlic, etc to mix together to help prevent pests and diseases.

#### **6. Target markets of cooperative**

- Export of fruit concentrated juice to Europe, Korea.
- Process and create final products to sale to consumers and tourists visiting the cooperative's farm.
- Build brandname: Cooperative will make its own brand for the products of cooperative in Dien Bien in the near future, separate from the brandname of Ha Phong cooperative in Hoa Binh province.

#### **7. Main challenges of agriculture in Dien Bien:**

- Finance: Need budget to invest, in the dry season investment in irrigation systems.
- There is no processing factory in Dien Bien.
- High transportation costs
- Transport is difficult
- Lack of quality seed, seedling system

## Annex 13: Notes visit Thanh Yen Agricultural Service Cooperative (Hana) in Thanh Yen Commune

Interview Mr. Quảng Văn Tới – Director, Chairman of director board of Thanh Yen Agricultural Service Cooperative

### 1. General information of Coop

- Cooperative has been investing in high quality rice production for 4 years since 2016.
- Cooperative established in 2016 with 18 members and currently the cooperative has 230 members with an area of 165 ha. In the coming time, more members will be admitted.
- Cooperative gradually invests in rice production such as planting machines, harvesting machines, tillage machines, etc.
- Functions of the cooperative:
  - + Organizing, processing and trading rice.
  - + The cooperative buys all quantity of paddy of members. The output of the cooperative is over 1000 tons/year, of which 70% of paddy quantity of the members is sold to the cooperative, 30% left the households keep for food.
- The rice varieties mainly produced by the cooperative: Hana, Tam Thom, Ség Cu, etc.
- Labor: The cooperative has 15 full-time workers and 50 part-time workers.
- The main production region as of the cooperative are in 3 communes: Thanh Yen, Thanh Son and Thanh Hung.

### 2. Why do you establish Cooperative?

- Cooperative is a model of collective association, mobilizing collective strengths because of small-scale agricultural production. So establishing cooperative will quickly enter people's lives, create a community of association.

### 3. Why do you choose rice?

- Dien Bien rice is ranked in the top 3 of the best rice types. Dien Bien rice has GI, so it has the advantages of brand name. In addition, Dien Bien didn't develop industrial production so it is not polluted. The weather is favorable, specific for rice production and water source is guaranteed.
- Rice of Cooperative achieved VietGAP certificate. The cost for this certificate was supported 100% by government. The agricultural service center supports Cooperative in science and technology.

### 4. Activities in cooperative

- Cooperative built a collective technical process. The cooperative has engineers to oversee the technical process implementation in the fields.
- Cooperative buys fresh baddy from its members. And then the cooperative will dry, process and pack rice. It will solve the problem of agricultural environment, reduce labor force, create quality rice products, improve people's health and higher income.
- Change organic agriculture in association with ecological agriculture
- To production and trading plan, the marketing unit of Cooperative will decide the production orientation such as kind of rice varieties, quantity, etc and after that Cooperative will organize the production and transfer the technical process to its members.

*Associating with farmers has both advantages and disadvantages:*

- Advantages: Mobilizing the community strength.
- Disadvantages: You have to more invest time, effort and money. It took the cooperative 4 years to invest and unify production infrastructure and services in the cooperative. Essentially,

farmers don't like to be managed, like to work freely according to the custom and their experiences. Those who don't comply the rule of cooperative will be reminded, fined and sent out of the cooperative after many breaches.

#### **5. Inputs of Cooperative**

- Inputs of Cooperatives are pesticides, fertilizers and seed. We are buying them from Japanese company and South Korean company. They have institutes specializing in pesticides, fertilizers and seed research. So we believe in their product quality.
- The price is 15% higher than in Vietnam but the production cost reduces because of less pests and diseases, stronger rice plants, better yields.

#### **6. What do you base on to admit the members?**

- Base on production plan, resources, production regions → We need to manage them.

#### **7. Difficulties of Cooperative**

- Infrastructure services for agricultural production are poor, the production with traditional experiences affects the environment, using pesticides makes the soil degraded.
- Organic agricultural production faces many difficulties. Need to have an overall plan for agricultural development, how will each stage develop to create good production infrastructure.
- Currently, the cooperative is facing fierce and unwholesome competition from many large enterprises that don't invest in rice production in Dien Bien but still use the brand name of Dien Bien rice to sell such as Vinafood, Bao Minh. Vinafood has a brand name of Dien Bien Tam rice.
- There are 3 rice production and trading cooperatives in Dien Bien.
- The State needs to protect consumers' interests and producers. If the producers are not protected, they will not produce according to the technical process and the quality of the product is low.

#### **8. Markets of Cooperative**

- Supermarkets in the North
- Online channel to customers.
- Sell to wholesalers and retailers in provinces in the country.

#### **9. Price**

- The selling price of the producer to cooperative: In the first years, the purchasing price of the cooperative was lower than the outside price, but after each year the cooperative bought the price increased by 10% and now the purchasing price of the cooperative is 15% higher than the outside. Value of rice when sold to supermarket and production cost evaluated in previous year are used to calculate the price of rice for the next year, and the contract is signed with members
- Cooperatives sell at the same price across the country. The selling price is 1.5 times higher than the price of the same type of rice in the free market.

#### **10. Contract with supermarkets**

- Cooperative has contracts with supermarkets. In the contracts there are 2 fixed clauses: Price and the brandname of Cooperative. The supermarket must sell rice in "Gạo Tâm Sáng" brandname (it means rice is packed by packing of cooperative).
- Cooperative want to change the price, Cooperative will inform buyers before 3 months.



## Annex 14: Notes meeting with agriculture services Dien Bien district and other organizations

*Participants: Donre (2 persons), Farmers' Union (Phuong), Statistic office, agricultural service center, Anh Chi Em (3 persons), Mr Thanh vice head office and Mr Son and Mr Phong from the office; Mr. Thang, deputy of DARD*

*Data on map for land use and other statistical data already prepared*

Total land area: 139,595 ha, in which 99,522 ha of Forestry = 54%. Natural forest more than 75,791 ha Rainforest protection policy. Forest plantation = about 26 ha/ year.

From 55 to 21 communes ← Communes combined with Dien Bien Phu city. 140.000 ha. More than 10.000 people → Thai as 55% and Kinh = 25%, Lao: 2%, H'mong = 5%

12 communes in the valley = low land = very good condition for agriculture and for market. Good accessibility = transportation easy.

Communes near border with Laos = quite large area but limited cultivation area = high percentage for forest.

More than 21,447 ha of cultivated land. About 77.000 tons/ year (70.000 tons last year)

Main crops: rice and maize. Other crops in slope lands = cassava.

Spring rice :4,120 ha cultivation= > 21.000 tons. Summer rice is 5.386ha; Upland rice of 1,780 ha

Maize = more than 3.000 ha. Nearly 20.000 tons/ year

cassava, edible cana= 2,400 ha.

Industrial crops annual crop: 61.5 ha (mainly peanuts: 60 ha); perennial crops: 2,357 ha; in which rubber = 1,107 ha, fruit trees = 1,140 ha; and macadamia of 110 ha

Vegetables = more than 2,000 ha;

Livestock and aquaculture:22,640 buffaloes, 14,763 cattle; 1.4 million poultry

Aquaculture: more than 600 ha including big lakes and small ponds.

Cooperatives: 32 coop = 26 operational, 1 stopped working = 6000 coop members. All are new cooperatives

9 OCOP (One Commune One Product) value chains: 5 rice, 2 honey, 1 dry fish products, 1 Cana DB glass noodles; 3 cooperatives with 3 or 4 stars (rice and honey).

6 markets: mainly communal markets: largest is Ban Phu. 138 shops on agricultural inputs: 128 shops having enough conditions for trading. For vet medicine and animal feed = 35 and are operating.

Rice: potential is high for branding. Many provinces know about Dien Bien rice. In the valley, focus on production of high Q rice: Hana, San Cu, Bac Thom 7 = high quality varieties

Innovations for rice production: to increase the quality of rice. Difficulties = planting pb in mixing different varieties. Use planting machines: support for farmers = 50% for buying the machine → Households (HH) can get around 10 million VND.

Some diseases = leaf blast = related to weather conditions (dev much with temperature under 30 degrees). Also problem that farmers do not follow the procedures and use mainly chemical fertilizers, even if provided with a lot of training. Use of varieties of rice also as an issue.

Market and marketing: coop. related to rice supply chain still at a small scale. Not yet built the material source region = rice source region not yet built up = need for a large production area = supply area not large enough for the cooperative. Linkage between coop and farmers not yet strong/ close enough.

Livestock production:

Potential for large ruminants. Annually, district has policy support for breeding cattle to increase the herd size, and support for the vaccination and disinfectants.

Advice for farmers in raising and animal health protection.

Difficulties: large ruminant diseases not a problem because good vaccination program.

For pig, concerns with ASF. Livestock VC = in relation to big project, build a cooperative on livestock. Built a beef VC last year.

Meat provides for domestic consumers and also Hanoi and Nam Dinh province. Dien Bien cow and buffalo = quite popular.

Focus on livestock in the valley communes to increase poultry production and pigs. Other 9 communes in the border = focus on large ruminants.

Large ruminants: use of fence or keeping pen. Not free grazing any more. Learnt from research project for dev of large ruminants. Use of biomass maize silage for winter time animal feeding.

About slope land cropping:

Do not encourage it because related to area of forest. Just maintain the old slope lands = main crops = cassava, upland rice and small areas of bean peas = just for additional income because of low productivity.

Some areas of cassava bring good income for farmers

Forestry: encourage farmers to restructure their home gardens with pomelos, mangoes, 'pomme de lait' (vu sua)

Some supply chains of fruits trees = green pomelo and vu sua

Rubber = more than 800 ha. 1500 tons. Farmers can get 10% from products when sign contracts for growing rubber.

Aquaculture:

Mainly on small irrigation lakes. Some intensive ponds. Productivity = more than 1000 t of fish = Tilapia of Taiwan. One dry fish product with OCOP 3 stars = mainly in restaurants within districts and some export to Lai Chau and Son La.

Bring quite good income for farmers

Vegetables: 2000 ha/ y over 3 seasons. Land area = 700 ha. Several large areas in Tan Luc, Po lot, Thanh Long and ... = provide vegetables all year round for DB and Lai Chau province.

Some herbs = rau thom, rau huy. Some communes concentrating on this.

Maize: maize grain and maize silage? Area including grain and biomass maize.

Winter maize season = good income = from selling the grain but also the straw/ stem ('tiges') after the harvest of the crop. 8 to 9 t of grain and 10 to 15 million from sales of the stem

Area of biomass maize still very small. Started being adopted with big project.

Want to maintain area of maize but want to increase silage part.

## Annex 15: Notes visit cooperative Safe vegetable Pom Lot

*Nguyen Van Thang – Director of the cooperative*  
*Anh Su - Board of Directors*

The cooperative was established in March 2017. Currently, the cooperative has 21 members who are vegetable farmers in the commune. The area of land for growing vegetables is 6 hectares.

The main product of the cooperative is safe vegetables. Production of vegetables. It is cauliflower, tomatoes, in addition, there are other vegetable products such as kohlrabi, beans, cabbage, etc. Vegetable output is 200-300 tons/year. After the establishment of the cooperative, the cooperative is supported once with seeds, fertilizers, and pesticides for vegetable production.

In vegetable cultivation, households use a combination of organic and inorganic fertilizers, and use pesticides of biological origin to prevent pests and diseases. Members use trichoderma mushrooms to prevent and treat some diseases on vegetables. Households use groundwater in vegetable production. Water source is from drilled wells and dug wells in the field. Households use plastic pumps and pipes for watering.

Vegetable growing households mainly rely on their own experience and knowledge from the media and mass information such as radio, newspapers, and television. In addition, households also apply new knowledge after being trained. During the cultivation process, the cooperative members shared their experiences in growing vegetables. When households have technical support needs, the cooperative asks specialized agencies of the district for assistance.

Cooperative members are self-directed in the production and consumption of vegetables by the family. Cooperatives provide regulations and incentives to produce safe vegetables, comply with isolation and use pesticides.

Vegetable products of the cooperative have been sampled and analyzed by local specialized agencies for pesticide residues. The results of the analysis of vegetable products all met safety standards, ensuring pesticide residues in accordance with regulations.

Some households have recorded the production date to gain experience in production. However, most of the other households have not kept a production diary.

Consumption of products: All products of the cooperative are sold by traders, then traders sell in the local market or neighboring provinces, Hanoi sells to Laos. Vegetable consumption increased after the establishment of the cooperative. Production cooperatives rely on market signals to control production. If the products are not sold out to traders, households sell them themselves at local markets or markets in Ho Chi Minh City. Dien Bien Phu. Products sold to other provinces and Laos account for two-thirds of the cooperative's output.

The cooperative used to work with Hoa Ba supermarket to find a way to sell products in the supermarket system. However, the output that can be imported by supermarkets is low, only a few kilograms per week, so it is not possible to consume all of the cooperative's products. Therefore, the cooperative does not cooperate with the supermarket anymore.

Some farmers applied to join the cooperative, but because the cooperative was not developed, they did not agree.

Cooperative development orientation:

- Support member households to increase income through production more efficiently.
- Wish to sign with the output off-take enterprise.

Difficulties of cooperatives:

- Difficulty in finding a business to consume products.
- Traffic is difficult, so it is difficult to sell products.

## Annex 16: Notes visit Dien Bien Honey Cooperative in Sam Mun Commune

Interviewed: Mr. Nguyễn Tiến Đạt – Director of Dien Bien Honey Cooperative

Location: Sam Mứn commune, Điện Biên district, Điện Biên province

### 1. General information about Coop

- First Cooperative was established in 2012 with more than 20 members but then stopped due to ineffective operation. In February 2019, the cooperative was re-established with 9 members, concentrated mainly in Sam Mun commune and the annual honey output of Cooperative was about 80 tons of honey.
- Members of the cooperative are typical farmers who are passionate about beekeeping.
- The reasons for the Cooperative establishment: After returning home from University, I saw that the honey in the locality had good quality, was delicious but no branding. A foreign company wanted to buy a large amount of honey, but we didn't have enough honey quantity to sell → We established this Cooperative.
- The charter capital of the cooperative is 1.5 billion VND, of which working capital is about 400 million VND.
- Cooperative has about 1600 bee colonies.
- Currently, Cooperative does not have a salary for its leaders.

### 2. Products

- Cooperative's products are quite diversified but mainly focus on 2 key products and these two products achieved 4 stars OCOP
  - + Hoa Ban Honey
  - + Colony Honey
- In addition, Cooperative has also tested new products such as beewax candle, raising domestic bees, etc
- Honey quality: Very good because bees raised in the locality often suck nectar from many kinds of flowers at the same time (multi-flowers), so the quality is better than honey with only one flower (single flower).
- The output of the cooperative is about 80 tons per year, of which 20-30 tons is sold under the brand name of the cooperative, while 50-60 tons is traded in raw honey to companies.

### 3. Access to sciences and technologies

- The cooperative has approached the science and technology of bee production from international experts (Germany) and Vietnamese experts from Research Center for Tropical Bees and Beekeeping of Vietnam National University of Agriculture, National Bee Research Center of National Institute of Animal Sciences. The cooperative has sent its members to attend bee training courses in Hanoi

### 4. Product quality management in Cooperative

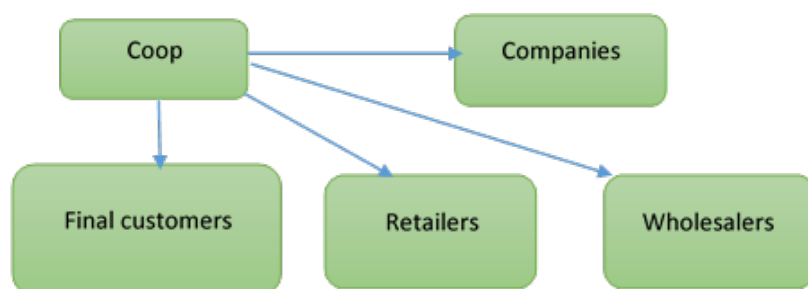
- Cooperative built a technical process to all members, then the cooperative will check the quality of the products before purchasing and the products of the members who meet the requirements will be bought. The cooperative will immediately pay the cooperative member at the purchasing time or the cooperative member can contribute to the cooperative as shares. The members will decide this.
- The quality of honey depends on 3 factors:
  - + Nectar source. Different nectar sources give different honey qualities such as with longan nectar, honey is cloyingly sweet, while with Hoa Ban nectar honey is soft sweet, its color is lighter.

- + Beekeeping techniques.
- + Technique to reduce the humidity of honey: Current techniques to reduce the humidity of honey will simultaneously reduce 80% of the honey taste. But some new technologies still retain the flavor: Vacuum technology. The price of the device is about 180 million VND. The cooperative worked with the Center of Agricultural Services to buy that machine and was supported with 50% of the price.
- Residual content of harmful substances: The honey of the Cooperative don't have residues because the cooperative has many members who have a lot of experiences in beekeeping. The cooperative was also trained by foreign experts (German) and achieved the certificate about European export standards in 2009.

## 5. Market

- The main market of the cooperative is the domestic market, in addition, the cooperative also exported 500 colony honey boxes to Dubai through Tam Dao Bee Company. However, the selling price is still lower than the retail price in the domestic market.
- In the domestic market: The cooperative sold raw honey to companies such as Hanoi Bee Company, wholesalers, etc in other provinces. In addition, the cooperative also sells products to consumers under its brand through online channels, product introduction shops, fairs, etc
- The main markets of the cooperative: Dien Bien and some other provinces such as Thai Binh, Hung Yen, Lang Son, Hai Phong, Dak Lak, Son La, etc...

### Market channels of Cooperative:



- The cooperative didn't meet the requirements of Vinmart system in Ha Noi because The Cooperative has no warehouse in Hanoi, meanwhile Vinmart requires the cooperative to have its warehouse in Hanoi so that when Vinmart needs products, the cooperative must immediately provide products to Vinmart system.

## 6. Selling price

- The price of honey is still dependent on the big companies because they decide the honey market, the output of honey.
- The selling price of the cooperative is now about 40% higher than the outside, after the product gained OCOP standard with 4 stars.

## 7. Impacts of OCOP program

- There were no standards about honey quality before, the honey was no standardized, so OCOP 4 stars helped the cooperative standardize product quality. The cooperative proclaimed its honey quality standard.
- Customers need more from the producer, not just the good product, as they need to have information and data on product quality, beautiful packing to create consumer's confidence. Participating in OCOP helps the cooperative's products have better packaging, better design and product quality announcement.
- OCOP helps cooperatives to promote its marketing activities.

### **8. Some challenges of participation in OCOP**

- To take part in OCOP, the cooperative has to invest in many things such as human, accounting system, product test (the cost of product test of the cooperative in 2020 was about 80 million VND), product identification system (QR code), label, packaging, etc.
- The choice of honey test criteria depends on the cooperative's partner. Currently, there are about 18 indicators for honey quality test and partners require which criteria to test, the cooperative will analyze those indicators.
- Cooperative sent honey samples for testing to Vintest company in Hanoi, National Testing Institute and many other testing bodies. Cooperatives want to try the testing in many places to compare the testing results and to know where the testing is better.

### **9. Difficulties of Cooperative**

- Human: Its members are farmers, so their ability to access the market is still weak.
- Lack of funds.
- Financial and accounting management is still weak due to the lack of budget to hire a good accountant.
- The product brand name of Cooperative has not been fully exploited.

### **10. Cooperative's strategy for market development**

- Effectively exploit the brand name of Cooperative to increase the retail sales.
- Develop kinds of new products such as peach lemon honey, domestic beekeeping, bee wax candles, pollen product, etc.

## Annex 17: Notes meeting with agriculture services Tuan Giao district and other organizations

### Participants:

*Anh Trung - Department of Natural Resources and Environment*

*Mr. Hien - Director of the Service Center*

*Ms. Huong - Chairwoman of the District Women's Union*

*Anh Duyen – Farmers' Association*

*Anh Tuan – District Statistics Office*

*Anh Quang - Macadamia tree planting project*

*Anh Son - Director of Son Hanh Company (salmon farming)*

### **Agricultural situation of Tuan Giao district**

Agriculture is still underdeveloped. The economy of the district is mainly based on forestry.

Farmers produce mainly according to tradition.

Agricultural land area 103,000 ha.

The district has a lot of potential for development but has not been exploited.

The rate of poor households is 34.2%. The district's average income per capita is 17-23 million/person/year. Target NTM reaches 36 million/person/year.

Weak agricultural cooperatives. Currently, the whole district has 32 active cooperatives, 18 ceased operations. In which, there are 21 agricultural cooperatives. Cooperatives are mainly co-operatives with private and household activities. They have not yet operated in compliance with the 2012 Cooperative Law. The district wishes to receive support to develop agricultural cooperatives.

The total budget allocated 2 billion for the agricultural sector. The district prioritizes supporting the development of chain links. Therefore, in the last 2 years, they have mainly focused on supporting the development of fruit trees (longan and other fruit trees). The link in the chain is still weak. People set up nests to plant and receive support, however, households have technical difficulties and poor care. In the link there must be a decisive role of the business.

### **Cultivation**

The main crops are rice and maize

Common rice cultivation area: Spring rice 800-1000 ha. Summer rice is nearly 1800 ha.

The main areas of intensive cultivation are upland rice and maize. Upland rice 3200 ha (1 crop per year). Corn land area 6500 ha (2 crops/year)

The policy is entitled according to decision 45 of the province. Total funding for each district is 2 billion/year for all agricultural activities of the district. Therefore, there is a lack of resources for agricultural development.

National target programs: New rural program, sustainable poverty reduction program. Funds from these programs directly support people.

In the area, there is a model of growing coffee trees in the commune.... Coffee varieties are highly appreciated by households, suitable for the locality. Looking forward to continue to support the breed for the people. In addition, need to support more fertilizers and drugs.

Also demonstration farm on coffee in Thua Think and variety very preferred by the farmers = suitable with local natural conditions. Support for seedlings and fertilizers = most important for farmers who lack of knowledge and limited access to suitable and good varieties.

### **Macadamia plantation**

Macadamia nuts are grown by Dien Bien Macadamia Joint Stock Company

Area: 1400 ha in Quai Nua and Quai Cam communes. Macadamia has been planted in the 6th year and starts to harvest from 2020, 50 ha for harvest. By 2021, 250 hectares will be available for harvest. According to the assessment Mac Ca Tuan Giao gives the best quality in Vietnam. Aiming to plant 2000 hectares of Macadamia in Tuan Giao district

There is a direction to grow smallholder macadamia by people in the garden. Some people have tried growing Macadamia intercropped with coffee in Toa Tinh commune.

The price of seedlings is from 180,000 to 200,000 VND/plant. The district wishes to support research and experiment to grow macadamia trees, support capacity building for macadamia growers.

Willing to invest more in macadamia in this district = in procedure for application for land = TH milk company also, for 'tourteaux' = macadamia not meeting the grades.

Orientation this year the district will support OCOP for Macadamia products.

Looking for the research on intercropping between coffee and macadamia for farmers. Encouraged by MARD.

Wishing to support the development of the district's macadamia tree:

- To receive scientific and technical transfer
- Technical support from project programs.

### **Livestock**

Beef cattle thrive: nearly 17,000 heads. The provincial plan assigned to implement in 2021 is lower than the current reality.

Buffalo: 17670 heads. The province has to grow to 23000 in 2021. Very difficult to do. However, raising buffalo will be more profitable than raising cows. Buffalo market is easy to consume.

Cattle raising with grazing grounds and controlled herding.

In the district, there used to be a project to raise Australian cows of Mac Ca Dien Bien Joint Stock Company. However, it is not possible because it is not suitable for local conditions. Australian cattle breed is not suitable for local conditions, investment in large barns. Australian cows are free-range, not suitable for local captive breeding.

According to the assessment, the buffalo herd is decreasing because people do not like to raise buffaloes due to: High seed price; Breeding time is 2-3 years long before giving birth to 1 child; Agricultural production has been mechanized, so the demand for traction from buffalo has decreased.

In the area, there are a number of experimental breeding models of the Institute of Livestock Production, which can be replicated.

Pig farming:

- Total current herd: over 45,000 heads.
- Affected by African swine fever.
- The herd repopulation is slowing down due to the impact of African swine fever. Household psychology is afraid of epidemic, high price of pig breeds.

Orientation for livestock development:

- District plan to develop buffalo and pig herd

Technical transfer in the district = from NIAS with demonstration farm and technical transferring being implemented.



## **Aquaculture**

Cultivation area: 295 - 300 ha. Small-scale farming, dispersed according to household size. Distributed over 18 communes of the district

Since 2016, there is 1 farm raising sturgeon and salmon. (Son Hanh Co., Ltd., raised in Tien Phong commune). Supply products in the province and outside the province.

## **Forestry**

Forest area: over 43,000 ha. Forest coverage is 38%.

Focus on zoning, promoting forest regeneration and protection. Annual afforestation about 50 ha, limited afforestation.

Forestry development is relatively stable.

## **Cooperatives**

32 cooperatives = when established, 52 but now only 32 operating. 21 working in agriculture. Not yet following fully the 2012 law for coop. Situation of operation of coop = very poor. Government lost the control. Also want to develop these coop = not just name.

### **Priorities for allocating support from district:**

For linkages for fruit chains = longan and mango = only for one year and not yet for food safety = technical operation very poor, very low productivity. Not so sure that will get some fruits.

Linkage should have involvement of private companies, not only farmers according requirements from province or district to have cooperatives under the management of the government.

Currently in the district = mainly groups of farmers. Work together, contribute nearby each other

Priorities for fruit chains is according to national level and then provincial = to use resource, have to follow these priorities.

2<sup>nd</sup> priority = livestock but no money left.

Macadamia development = very important for local workers who take care of the trees = need to improve their knowledge → Farmers can take care of the macadamia

Beef project = farmers also use some land of the macadamia company to grow forages.

Previous plan of project to import breeding cows from Australia = 100.000 herds but problem including requirements for construction for the staple and for the slaughterhouse, and issue of animal welfare.

Plans of importing beef from Australia are not working = cattle in Australia work free grazing. Very high export requirements that they cannot meet.

Forestry development in the district = very good. More than 43000 ha. 38% coverage, mainly for plantations and re-plantations. Many re-plantations = 50 ha/ year. And protection.

## **Small groups discussions**

### ***Discussion with Huong from the Women union and Duyen from the Farmer union***

**Mandate of the women union:** propaganda for women member to implement the tasks and the socioeconomic mission in the localities = for local development; defend the rights of women and children; participate in activities to support gender equality in the society; build up union development; encourage women to show up the union

Cooperating with other organizations in the localities: policy for security, farmer union, social union

**Membership:** women above 18 years can become member. People can choose different unions and have to pay fees to be members. Between 18 and 35 years old, women may also be members of the youth union and may want to concentrate on one union; and above 60, they can join the elderly union.

Out of the 28.000 women in the district, 14.00 participate to the women union. The fee for participating in the women union is 1000 VND/ month.

Young people are less participating because many are busy with their jobs. However, young women who stay in the village participates fully. The group from 18 to 50 still represents a strong force of the women union.

In terms of ethnic group participation, the 6 major ethnic groups participate in the sub-groups at commune and village levels. Thai people represents above 50%; then comes H'mong, Kho Mu and Kinh.

**Types of activities:** implement resolutions from national and provincial levels. They organize meetings with women to ensure the dissemination of the resolution and they transfer documents, requirements, information to the upper levels. They implement actions to build up the New Rural Development program and they invite women to build their capacity in different aspects.

Regarding any agricultural model applied by DARD or officials in the localities, the women union will encourage women to apply.

They also have actions in relation to nutrition: they work with different grass roots organizations and club of mothers to take care of children: they exchange information. They also cooperate with projects, notably with World Vision which organizes training of trainers in the villages. They provide propaganda for children to go to school and for vaccination programs. They also work specifically with young parents, especially under 16 years old.

Women union participates in any program at district or province level, mainly to ensure propaganda.

When women face a social problem of inequality in their family, they can ask the women union for support.

**At district level, 4 staffs are working in the women union:** 2 heads, 2 vice heads. There are also sub heads at commune level. In total, there are 29 members in the women union committee at district level including the sub heads at commune level and lead women from different offices. Out of this committee, 9 members form the board which is leading the committee. At commune level, there are sub groups with lead groups and sub committees.

The main concern for the young women is to improve the family income and build happiness educating children + peaceful relation in the family.

Women working in agriculture need capital for production. Young women still lack experience in agricultural production, and therefore, often hesitate in participating to innovations.

**Farmer union:** also **mandated** to organize the propaganda for the farmers participating to the union and to protect the rights of the farmers. The propaganda serves to ensure that farmers follow the law and abide to the regulations and to promote models for agricultural and economic development.

Regarding investment in innovations, they work on using new breeds and seedlings and new technologies.

3 resolutions: 1) to improve agricultural production to improve income for sustainable reduction of poverty = the most important; 2) to build new rural development; 3) to ensure the security of localities and of the country

384 HH in the district have received an award for their good agricultural practices during competitions with criteria to score at different levels.

There are 19 sub-groups (one per commune) and 13705 members in the 167 sub unions (per village).

4 full time staffs work for the farmer union.

**They organize 11 agricultural models** (pilots), which are currently operating though at different stages: each model is managed by an interest group or a club. 6 are about livestock (reproductive cattle and buffalo, commercial chicken production). One model is for passion fruit, the other 5 are for fruit trees: mango, macadamia, longan. These models are supported by the government and managed by the farmer union (in which, = 2.3 billion VND from the Farmer Support Funds, managed directly by the farmer union for models in Quai To, Quai Nua, Pu Nhun and Muong Mun communes; other Funds are under district management).

As part of the models, which consist in demonstration farms, farmers get credit for buying seedlings, breeds, vaccination, etc. with 0,7% interest rate / month as a fee. And FU works together with the career centers (which falls under the education sector, together with Universities, etc.) to organize training courses.

As part of the 11 models/ demonstration farms, the passion fruit ones is the only one which is already producing fruits and these are not uniform, no standardized quality. Hence, they are sold on normal markets. 35 HH are involved in the 6 models in animal husbandry = HH with land and labour available for forage growing. In initial stages, the 35 HH visit each other; then farmers outside the model will visit by themselves.

To select farmers for the pilots: 1) Informed the communes that they will set up demonstration farms; 2) farmers registered; 3) they organized pre surveys in the communes and selected the most suitable farmers.

One model is already completed and has received a very good evaluation from the province (evaluation done by the farmer union at provincial level, every 6 months check and evaluation every year + locally, FU in charge of monitoring on a monthly basis). They contacted provincial media for dissemination but have not communicated directly with other organizations such as agricultural extension centers. They have not done the extension and scaling up as they receive limited funds from the province.

**They also send members to be trained in career centers:** 30 to 40 courses per year on average: livestock husbandry, cropping, forestry production + mechanical repair. They are opening courses according to training needs, each with about 50 participants. Limitations: farmers need to implement after the courses but often lack capital and so small proportions can actually apply what they learnt.

Training are only in Kinh language, not in other ethnic languages. But propaganda is done in the different languages. 40% of the participants to the trainings are women. Some trainings are based on government programs and others are developed based on farmers' demands. Topics cover disease prevention, technical practices in cropping and husbandry). Some farmers also have demand for building their professional background such as soy bean processing. Demands concerning career development are often not very specific and the center supports farmers in specifying their demands. Older farmers' demand concerns more technics about animal husbandry and farm while younger farmers want to develop careers, notably outside agriculture (e.g. reparations of motorbikes). Young people are also more concerned about nutrition while older people care about health care.

FU does not organize trainings on marketing. But members are participating to such trainings of organized by big projects (e.g. the NGO FIC which organize trainings on financial aspects, also CMF organizes trainings for women to improve their capacity in marketing and finance.

**Farmer Union (FU) also collaborates with social and policies banks to provide credit to the poor.** The Union manages 129, 788 billion credit funds collaboration with the Policy Bank and other district organizations under 82 credit groups. 3700 HH gets loans, with amount per loan which varies from 8 to 50 millions (with a new policy yet to be implemented allowing to go up to 100 million loans). Many loans are for buffalo and cattle production, and house building and clean water systems.

They operate 12 programs from banks regarding credit for poor / for livelihoods. The ethnic group programs are at no interest rate, the programs for the poor are at 0,55% interest rate per month and the trading and production ones at 0,75% per month. The duration for the production loans are from 3 to 5 years while it can be up to 10 years for household building.

They cannot meet all demand and have to select in cooperation with the banks. Women union is also participating in credit program and managing an additional 140 billions VND fund. Youth union is also having a credit line.

FU faces a 12% slow repayment and about 5 to 7% are not able to pay back.

FU also manages farmer supporting funds built up by government.

**2 communes are pointed out for the difficulties they face** = poorest people mostly in these communes: Pu Nhung and Toa Tinh (where mostly H'mongs and Thai people live). People there are facing difficulties regarding water resources for agricultural production. The main sources of income come from maize and industrial trees (including sugarcane and pineapple) on slop lands = almost rainfed land.

In remote areas, income is mostly based on slope rice, maize, sugarcane, passion fruit and pineapple.

Maize, upland rice, soybean and some vegetables are the main crops in the district. Vegetables are supplied within the district and in other districts. Livestock and poultry go to different districts.

**Inputs and pesticide issues:** Farmers do not face problems in buying inputs that they can buy in local shops and they access breeding materials from commune and districts. According to the FU, there is an increased awareness of the farmers regarding pesticides: pesticides packs are collected after use (however still as normal garbage, and in remote areas, they are buried) and farmers are less spraying.

#### **(Other) Small groups discussions**

***Interview with M. Hoang Van Thien (Agricultural Service Centre), M. Quang Van Truong (DONRE), M. Vu A Thu and Nguyen Van Tien (DARD)***

#### *Main transition regarding the agricultural production in the district*

Before 2000, the district was the biggest producer of soy bean, but the area decreased, and now only 10% of the previous area (only 40 to 50 ha). The price of the soy bean is too low and the weather is not convenient (still raining during the harvest time) so the farmers switch to vegetables or other crops.

The second main transition is the decrease of cassava production. The price is not high. Cassava becomes not an efficiency cash crop. The Cassava production is not good for the soil fertility. So the DARD doesn't recommend farmers to grow cassava anymore. To achieve the objectives (decreasing the Cassava area) the DARD focus on propaganda, and policy to support the transition to some other crop. The Cassava produced in the district is a native varieties of cassava, with a low price and low yield. There is not Cassava facilities in the district (need to send it to Điện Biên District). Another reason is the lack of labor. Young people are moving to the city to find some outside agriculture work. With this lack of labor, farmers switch from upl rice and cassava to less labor intensive crops.

For the maize production there is not change. They focus on spring season maize.

Agricultural Service Center organises training to farmers on how to use new varieties, technical advices, how to use the pesticides. But the farmers are not following the guidance (old varieties, not proper use of pesticides).

#### *Advantage of the district*

- Good quality of soil and fertility
- Good environment

- Farmers use a lot of native varieties. The yield is not so high, but the adaptability and the quality is good.

The cow herd of the district is growing quickly, currently, Tuan Giao has 17.000 heads, while the assigned threshold given by the provincial people committee is lower than that. The buffalo herd of the district is 17.670 heads, while the expected number according to the plan of the provincial government is 23.000 heads.

To achieve the objectives regarding the buffalo herd : need to provide enough forage to feed the animals. The natural grazing area decrease with production of Maca. They provide new varieties to expand the forage production area and find some fund to support farmers to buy new breed of Cattle. They encourage farmers to use small piece of land around the house and the road to grow forage. It's well adapted to the scale of farm (2 to 3 buffaloes, for the big farm it's 8-10 buffaloes). The land available and used for the forage production is not known in the district (DONRE).

They recommend farmers to try to use new varieties but keep the Elephant Grass just to be sure to have enough forage in the farms (a switch from one to diversity of forage). Elephant grass is used for a long time ago. It's a good forage also for the fish production, in addition to cattle and buffalo.

### Maize and upland rice

The areas of upland rice and maize:

- Upland rice: 3200 ha
- Maize: about 6500 ha (2 rounds/year), Tuan Giao is the second largest maize producing district of the province

The DARD try to reduce area of Maize and upland rice on the slope land. The yield are low and the economic efficiency of the crops are not interesting for the farmers. Maize in flat land. The yield are good, but the price is not good. The farmers sell to traders from Son La

They encourage farmers to switch to Maca, mango or pomelo with higher value. They try to involve them in the VC but they have not specific budget for this activity. They identified 4 communes to support the transition to fruits production (and use the budget of 2 billion VND from the Provincial government) : Quai Nua, Quai Cang, Quai To and Sam Dong. The focus on these communes because of soil condition, topography, work force, natural conditions, traffic condition. They work for several year now. But it's easier with the Maca VC because the private company invested. For the fruits they don't have a private investment.

### Waste management

Fertilizer and pesticide. Started to collect the bags and bottle in one commune (Quai to). Then they send the waste at Provincial level. They collect all from different district and send to another Province (Vin Phuc ?) to treat. They start with one commune because they have a limited budget (1 billion/ year to collect, send and treat the waste).

They collect the waste from the household in 3 neighbour commune of Tuan Giao city. They classify in: compost (organic waste), plastic (to be burn), and metal

Livestock activities: a big pig farm in Xa dong commune stop the activities after the ASF. They treated the animal waste and produced compost. The smallholder farmers produce compost, just some of them are producing biogas (rare).

They don't have processing companies producing waste in the district. The coffee production is not process in the district. The processor who process coffee use dry coffee (no berry).

### Allocation land resources

They follow the Provincial plan, even for the biggest company installation. TH Milk when they came in the district, they ask to the Province where they could implemented there activities.

### Maca production

According to the quality standards of Vietnam Macadamia association, Maca growing in Tuan Giao is considered as the best maca in Vietnam.

1 400 ha of year 6 Maca production. The company collaborate with farmers who can give land to increase the production area. 15% profit for the farmers when the Maca can be harvested. Before 5 millions/ha/ All the cost are under the Compagny responsibilities: fertilizer, labor, seedling. The land was under maize and upland rice before.

Farmers in Tuan Giao are interested in intercropping macadamia with coffee.

TH True milk (a second largest milk producer in Vietnam) is considering to invest in growing maca in Tuan Giao, they also intended to establish a processing factory.

### Forest

According with the Provincial government plan, the district need to reach 86 000 ha of forest. The forest currently covers 43 000 ha. They start supporting the forest covering long time ago and the current phase (2019-2023) is supported by a national programme. They give a land certification for sloped land for the farmers. They wish the farmers will start to protect the plant and small tree regrown and plant some. The government will pay the farmers back some money if the forest reach some requirement (size of the trees, density etc.). No idea about the amount the farmers can get from this. The only issue is the bush fire. The tended livestock could graze in the forest, if the trees are big and tall enough.

There is not plan for livestock area without any piece of land plan to graze animals or to grow forage. In some commune there is a common agreement between farmers to use a piece of land to graze collectively animals. DONRE will keep these pieces of land for the grazing area purpose.

### List of documents and data provided by DARD and DONRE:

- Report and Statistical data with 10 years data (soft copy)
- Cooperative businesses working in agricultural field
- Land use for 5 years
- Statistical table with annual data (2020) hard copy

## Annex 18: Notes meeting with Macadamia Dien Bien Company

### Interview with Anh Quang - Macadamia tree planting project

Macadamia tree planting project was approved in 2012. The company started growing Macadamia nuts in 2015. The model is about 7km from Tuan Giao center.

Cooperation mechanism in the project: Households contribute land to the Company to grow Macadamia. The contribution area is determined and marked. The company hires a consulting unit to measure and determine the area owned by the household. Households contribute land to the company to plant and later benefit, divide the annual output based on the area they have contributed to the company.

Share mechanism: Households contribute land. The company hires consultants to assign land owners to each household to determine shares. The company supports 5 million / 5 years / ha for households to convert to growing macadamia. Households enjoy 15% of the output from the 6th year of harvest. If the income from 15% is not enough, the Company compensates 5,580,000 VND/ha,

Currently, the Company has planted 1400 hectares, aiming to plant 2000 hectares. Planting density is 280 trees/ha. Hang – cave 6.5 m. Tree – tree 6.5.

The project helps generate income for people from 4-5 million/month.

Macadamia yield: Expected in the 6th year. 5-7 kg/tree. Year 7: 10-15 kg/tree. Year 8: 25-30 kg/tree. Normally, the average yield from the 10th year carries about 40 kg/tree.

Intercropping for Macadamia: No intercropping. The planting is done by the Company. If any intercropping is decided by the Company. If there is intercropping, from the 6th year, it can be intercropped because at that time the tree will close its canopy.

The company has a planting technique room and receives advice from Professor Nguyen Lan Hung on Macadamia care, pest control and disease prevention.

Techniques for taking care of macadamia trees: The company built a drip irrigation system to promote flowering and fruiting. Fruiting and flowering also depend on how to fertilize. The company applies fertilizing and watering techniques to have the highest efficiency for macadamia trees when flowering and fruiting.

Mainly use microbial fertilizers and use NPK fertilizers to fertilize.

Macadamia products are harvested, kept moist at 25 degrees and exported through the Vietnam Macadamia Association. The company has not done processing.

Macadamia varieties OC (imported from the Central Highlands through the Macadamia Association)

Currently, the company has not processed macadamia nuts, only sold fresh. If the output reaches over 1000 tons/year, then there is a plan for deep processing. If there is a factory, it will be located in Muong Nhe district because the company has an area of 20,000 hectares in this district.

The company builds water tanks to supply water for macadamia trees. Tanks made of cement with a capacity of 500 m<sup>3</sup> provide for 50 ha. The company uses a drip irrigation system to irrigate macadamia trees. The reason is because Macadamia tree is drought tolerant and Tuan Giao area has very little water, mainly rocky mountains.

Fertilizer volume for Macadamia tree: 3 years old 300g/year. 4 years old 600g, 5 years old 800g/year. Fertilize plants 3 times a year.

A group of 1 engineer and 5 workers will be in charge of taking care of 50 hectares of Macadamia. Technical engineer. 5 workers are mainly responsible for mowing the grass and hoeing the roots.

Macadamia trees rarely suffer from diseases. Every year, just fertilize, till the soil.

Macadamia can be pollinated naturally, so there is no need to raise insects to support pollination and fruiting.

Average labor cost of the company per year is about 8 billion VND.

Seedlings are propagated by grafting. Select good branches for grafting into evergreen trees.



## Annex 19: Notes meeting with Son Hanh Tuan Giao Co., Ltd (Fish)

*Interviewer: To Quoc Son – Company Director*

The company was established in 2011 and operates in the field of construction. From 2016 started cold water fish such as salmon and sturgeon.

The Company's fish farming area is 1500m above sea level. The company has 2 fish farms.

Farm 1: Area is about 1000 m<sup>2</sup>. Construction of cement tanks. Mainly salmon farming.

Farm 2: Area about 1 ha. The company builds a pond and makes use of water from the waterfall. Fish are kept in lakes. The farm raises sturgeon for meat.

The water source for 2 fish farms comes from the forest basin of about 370 ha surrounding the farming area. This is an old forest, primeval forest. Annually, the Company contributes 40 million VND to the locality as a fee for forest services for 370 ha. Thus, the area of 370 ha, in addition to receiving forest service fees paid by the State, also receives additional contributions from the Company.

In the early stages of fish farming, the company received technical advice from the Institute of Aquaculture One. The company also received S&T support in the early stages to raise rainbow trout. However, due to insufficient water source, it is not effective. Mainly affects cement ponds. The cage culture pond is not affected much due to the volume of water. Farmed fish use an oxygen aeration system.

The company purchased fish seed from the Institute of Aquaculture 1.

During the farming process, the Company has quick inspection companies to check the quality of the water source to ensure it meets the requirements of fish farming.

The company mainly raises sturgeon. The current fish production is about 40 tons/year. Farming potential can reach 60 tons/year.

The two farms employ 6 full-time workers, with an average of 3 workers per farm.

Feed in farming:

- Small fish stage. Feeding bran imported from France and Finland. The company buys through the importer. The company has not imported directly due to the small farming scale.
- Big fish use bran from Kinh Bac factory (made in Bac Ninh).

Disease:

- It comes from the water source. If there is a lack of water, the fish can get fungus.
- Treatment of fish diseases: When there is a fungus, limit feeding. Use salt to cure diseases (soak in salt water).
- Using drugs to increase resistance for fish, vitamins.

Wastewater management: no wastewater treatment. Water quality has been verified by specialized provincial agencies. The province has checked the quality of input and output water to ensure quality and there is not much change between input water and wastewater. Every year there is an environmental agency of the province to check the quality of wastewater.

### **Product consumption**

The Company's fish products are mainly for fish traders. The fish is then sold to Sa Pa, Hanoi and some other provinces. Local consumption of sturgeon is very small. Cong Tu has 2 restaurants, one in Tuan Giao and one in Ho Chi Minh City. Dien Bien Phu. The company sells sturgeon at these 2 restaurants.

The Company's sturgeon cannot be sold in the local market because it cannot compete with sturgeon imported from China. The company's price of fish is from 130,000 to 200,000 VND/kg, while the price of Chinese sturgeon is only 80,000 VND/kg.

**Oriented development**

The company's fish farming has just been invested and is still in the investment stage. If successful in fish farming, this will be a sustainable development model that combines ecology and brings economic benefits. If successful, the company can combine ecotourism services.

**Difficulties in raising sturgeon and salmon:**

- Salmon farm: Due to the erratic weather, there are years of less water.
- The most difficult due to the epidemic
- Lack of capital for development investment.

The farm construction area has been designed to leave ditches much higher than the requirements of the consultant so that when there is heavy rain, the flood will not affect the pond.

## Annex 20: Notes visit farmers field Breedcaf project in Toa Tinh Commune

Interview with Mr. Sô – Coffee (café) farmer in Breedcaf project

Location: Hua Sa B village, Toa Tinh commune, Tuần Giáo district, Điện Biên

### 1. General information about the village

- Number of households in the village: 44 households.
- Population: 175 people.
- Main income is from café production.
  - Café area of the village: > 70 ha.
  - Maize area: > 30ha.
  - Baddy area: 2-3ha.

### 2. Café area of family

My family has 2 café fields:

- First field: Planted over 10 years Catimor café with an area of 2ha.
- Second field: Cultivated 800 Arabica café trees in breedcaf project and 300 Catimor café trees around since 2017. The income from this field was 10 million VND in 2020. This is the first harvest.

Form of café production: Monoculture.

### 3. Experience in café production

I have over 10 years to plant cafe. Before we cultivated upland rice, maize with a low economic efficiency and so we replaced by café trees. I learnt technologies in café production from friends in Mường Ảng district.

### 4. Why do you join in the breedcaf project?

- Want to try new variety to see how the productivity is. If the productivity of new variety is higher I will re-place catimor café area by this new café variety to increase income.

### 5. Advantages of new café variety

- Bigger grain, better productivity.
- Many farmers visited and liked this new variety. They asked me for seed to grow.

**6. Technical process:** The way to take care of Arabica café variety is like Catimor café.

### 7. Plan of household in café development

- If the new café variety is better, the productivity is higher I will gradually replace the old low-yield catimor café variety.
- Can't expand the café production area due to out of land.

### 8. Café market

- I are selling fresh café at the field to local collectors in the village. Then collectors will transport café to sell in Son La. In the village there are 3 café collectors who have trucks to collect and transport café.

**9. Activities of coffee processing:** Café is not processed in the local due to:

- Lack of water to wash café beans.
- Lack of drying yards.
- Lack of drying ovens to dry the beans because it is wet café beans will be mouldy. Meanwhile, investing in a drying oven will be ineffective because the café output in the village is too small, so the capacity of the oven isn't used fully, the machine isn't used regularly.

The processing activities is implemented completely in Son La and then Son La will sell the final café products to customers.

## 10. Price

- The selling price of fresh café to local collectors is from 5,000-8,000 VND/kg of fresh café. In recent years, the price of cafe has decreased quite a lot. The price of café in 2011-2012 was about 12,000-15,000 VND/kg of fresh café.
- New seed café is purchased by the Breedcaf project at a higher price of 2,000 VND/kg compared to the market. The project only buys beautiful café grains, bad ones are still sold to local collectors at the same price as the old café variety (Catimor café). □ There is no quality classification, price between different café.

## 11. Economic efficiency

- Productivity: 7000 kg/ha
- Price: About 7,000 VND/kg
- Income: 49,000,000 VND/ha
- Production cost: 20,000,000 VND/ha
- Profit: 29,000,000 VND/ha

I must rent labors to harvest café. I will pay them according to quantity they harvest with a price of 2,000 VND/kg café.

## 12. Challeges in café production

- Bug: Affect on café productivity and quality. To treat bugs I bought pesticides from Agricultural service center of district.
- Agricultural service center also supported, propagandized the way to use pesticides.

## 13. Process of scientific and technical assistance in the district

- The Department of Agriculture and Rural Development and Agriculture Services Center provide trainings to farmers.
- When there are pests and diseases, the producer will report it to the commune, the commune will report it to the district and the district will send technical staffs to assist and consult the producer in eradicating the disease.

## 14. Government supports for café development

Initially, I grew coffee by myself without support from State, then in 2012-2013 the District Department of Agriculture and Rural Development sent its staffs to measure and count the trees and supported in money to me. Currently, State no longer provides support.

## 15. Market channels of agricultural products of village

