Agroecology and Safe Food System Transitions

SCOPING STUDY REPORT

Potential of Xieng Khouang Province as flagship site for agroecology and safe food system transitions in Laos

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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 (Fig. 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 (Fig. 2).

The present report describes the potential of Xieng Khouang Province as flagship site for agroecology and safe food system transitions in Laos.

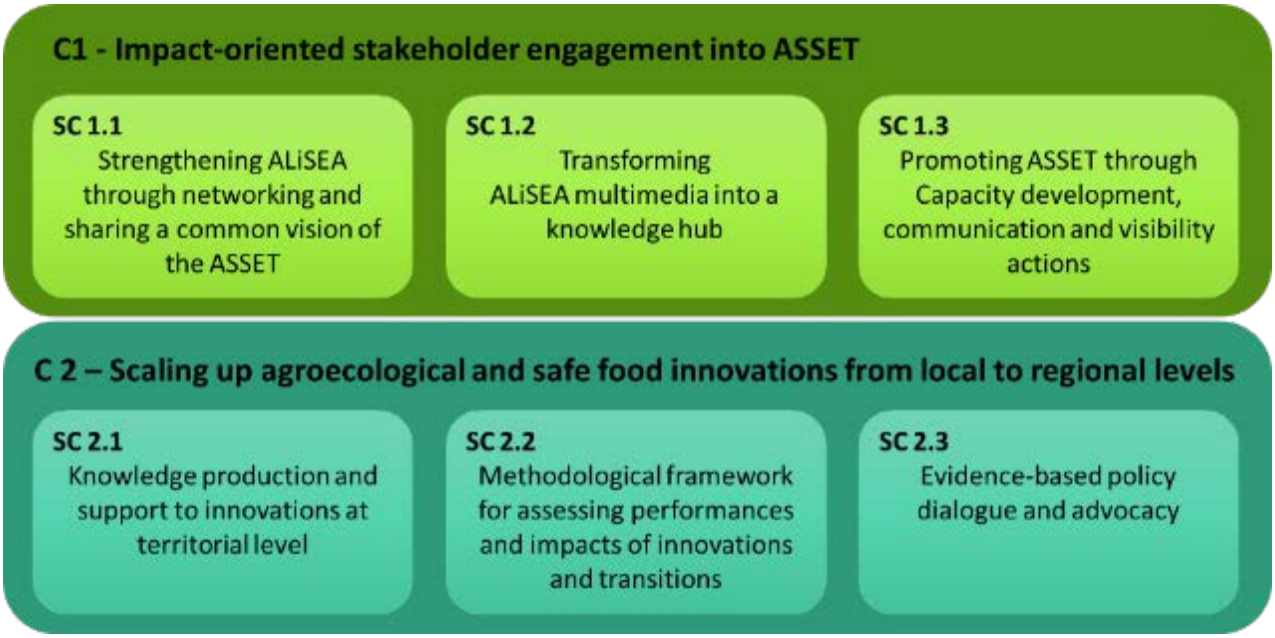


Figure 1. ASSET project structure

Figure 2. Potential flagship sites in the four targeted countries

2. Scoping study process

2.1 Scoping study methodology

Scoping study in Xieng Khouang Province followed a 5-step process:

- ***Step 1: Data preliminary collection and field studies preparation (Oct 2020 – Jan 2021)***
    - 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 agroecology and safe food systems in the different pre-identified sites(18 participants)
    - 25 projects and initiatives pre-listed (Annex 1) and mapped (Figure 3)
- ***Step 2: Field study (01 – 06 February 2021)***
    - Meetings and field visits organized in three districts: Khoune, Pek and Kham districts, where most of the projects were identified.
    - List of institutions and initiatives visited in Annex 2
- ***Step 3: Restitution to Xieng Khouang Province (29 March 2021)***
    - Scoping studies preliminary results and identified knowledge gaps were presented to Xieng Khouang Provincial Agricultural and Forestry Office (PAFO)
- ***Step 4: Restitution at the occasion of the Laos consultation workshop (6 April 2021)***
    - Scoping studies preliminary results incorporating feed backs and adds-on from Xieng KhouangProvince officials were presented to the 38 participants of the consultation workshop
- ***Step 5: Data analysis and reporting (Nov 2020 – June 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

- 9 experts from 6 institutions (Table 1) involved in field study, data analysis and reporting

Figure 3. Participatory mapping of main identified projects in Xieng KhouangProvince

Table 1. List of experts who participated to field study in Xieng KhouangProvince

	Name	**Organization**	**Expertise**
1	Mr. Phetsakhone Souliyalath	DALaM	GIS
2	Mr. Chanthavone Phonekhampheng	DALaM	Agronomist
3	Mr. Sayvisene Boulom	NUoL	Food system
4	Mr. Fue Yang	NUoL	Food system
5	Mrs. Hongnapha Phommabouth	GCDA/ALiSEA	Agro-Economist
6	Ms. Chansome Khounsombath	DoPLA	Policy and institutions
7	Dr Bounma Phengphachanh	NAFRI	Agro-Economist
8	Ms Thongsavanh Norlakham	NAFRI	Socio-Economist
9	Dr Stéphane Guéneau	CIRAD	Socio-Economist

3. Site brief description

3.1 Location

Xieng Khouang province is located in the northeast of Laos, at a distance of approximatively 400 km from Vientiane Capital. Located at the latitude of 18° 47'48" to 20° 57'42" and longitude 102° 37'43" to 104° 16'52", the province shares borders with many provinces:

- Houaphan province to the northeast
- Luang Prabang province to the northwest
- Vientiane province to the southwest
- Bolikhamxay to the south
- Vietnam (Nge An province) to the east.

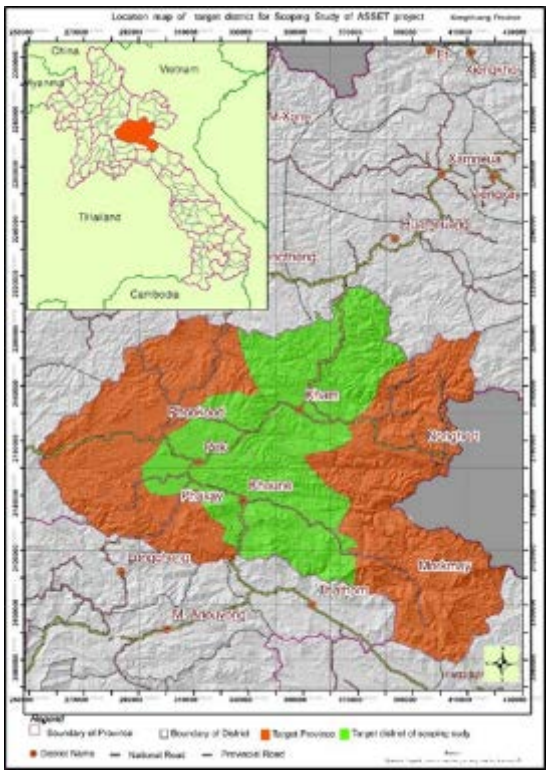


Figure 4. Xieng KhouangProvince location map

3.2 Population, administration and emerging economic sector

Xieng Khouang Province whose capital is Phonsavanh, is divided into 7 districts, 53 village clusters, 477 villages, and has currently a population of more than 264 000. The population density is about 15 inhabitants per km². The population is mainly composed by the Lao Loum (42.4%), Hmong (44.4%), Khmu (6.3%), Tai (4,0%) and Phong (2,8%) communities.

More than 65% of the population live in rural areas accessible by road.

The province has a negative migration balance. In addition, it suffers from a high migration of youth labour that migrate to the cities.

Table 2. Projected trends in population and labour force

No	Description	2017	2025	2035
1	**Households**	41.870	54.000	68.900
2	**Population**	250.300	293.300	340.400
	Male	126.000	146.900	170.300
	Female	124.300	146.400	170.100
3	**Labor force**	151.800	178.900	211.000
	Agriculture	132.700	125.200	126.600
	Industry	9.200	17.900	31.700
	Service	9.900	35.800	52.700
4	**Labor force distribution (%)**			
	Agriculture	87,40	70,00	60,00
	Industry	6,10	10,00	15,00
	Service	6,50	20,00	25,00

Source: Lao-Vietnam cooperation project, Report (2018), Agriculture land zoning projects of two provinces, Houaphan and Xieng khouang.

The road network is relative well-developed connecting neighboring provinces and Vietnam (one international border) and there are daily flights from/to Vientiane in Phonsavanh city. Only a small part of the territory, the very remote mountainous areas, is very difficult to access.

Energy and mining sectors are experiencing strong development : several large-scale and small-scale hydropower plants are operating (12 projects), Lao and foreign mining companies (62 projects) are exploring various minerals including gold, copper, iron, aluminum, zinc, lignite, and coal [Sources: (1) 5 year report of PPI of Xieng Khuang province, and (2) Council for Science and Technology of MAF]

3.3 Land use

The total area of natural land (2017) is about 1.272.000 ha

3.1.1 Land for agricultural production

There are about 211.500 ha of agricultural land, covering 16,6% of total natural land of the Province.

❖ **Annual crops**

Annual crops cover more than 51.100 ha (4.0% of total natural land of the Province) which are distributed as follows:

- Paddy fields cover 25.900 ha, or 2.0% of total natural land and 12,3% of agricultural land. The average production of paddy is 100.000 t/year. The largest areas of paddy field are located in Kham and Pek districts.
- Upland rice covers 19.600 ha, covering 1.5% of total natural land of the Province. The largest areas with upland rice are located in Nong Het, Kham and Mork Mai districts.
- Other annual crop: 23.800 ha, covering 1,9% of total natural land and 11,3% of agricultural land in the Province. Among these annual crops, main crops are maize and vegetables that cover respectively 20.800 ha and 3.000 ha (Source: planning section of PAFO).

❖ Perennial crops

Perennial crops cover about 1.850 ha, or 0,15% of total natural land in the Province. These crops are mainly fruit trees (mango, longan, Apricot about 1.200 ha), while coffee and tea cover respectively 36,0 ha and 291,0 ha.

❖ Pasture land

Pasture area cover about 107.100 ha, or 8,4% of total natural land and 50,6% of agricultural land in the Province. The largest pastures areas are mainly located at Pek, Phoukoud and Khoune districts. These areas are mainly natural grasses, with low productivity.

There should be developed for commercial big animal raising together with promoting the high and good quality of grass species [Source : Lao-Vietnam corporation project, Report (2018), Agriculture land zoning projects of two provinces, Houaphan and Xiengkhuang]

❖ Non Timber Forests Products (NTFPs)

A wide range of NTFPs (17 species) are found in Xieng Khouang the province including rattans, bamboos, medicinal plants and wild fruits mushrooms.

a) Medicinal plants

Xieng Khouang Province provides habitat for a range of medicinal plants. Farmers have an ancient tradition of using of these plants for various treatments. However, several medicinal plants are high-valued and some of these are exported particularly for the Chinese markets including…

b) Other NTFPs

NTFPs represent an important source of income for many smallholder farmers.

Table 3. NTFPs collected (Ton) from 2018 to 2020 in Xieng Khouang province

Name	2018		2019		2020	
	plan	Actual	plan	Actual	plan	Actual
Palm fruit (Mark Tao) ໝາກຕາວ	221	160	230	65	230	89
Red mushroom (ເຫັດກໍ່ແດງ)	66.5	10	70	12	100	14
Flower of tiger grass (ດອກແຂມ)	55	5	70	52	100	NA
Seed of wild ginger ໝາກຄ່າປ່າ	90	10	100	NA	100	NA
Cardamoms	12	2	15	1	15	4
Rattan ຫວາຍຫູນ (ເສັ້ນ)					1000	1000
Berberine (Kheua heam) or Coscinium fenestratum, ເຂືອແຫມ	158	50	160	NA	160	NA

3.1.2 Forest

The forest cover of the province is estimated to be 54,9% of the total land area and important catchment areas for the Ngum, Khao, Mat, Ngiep, Xan, and Moo Rivers. In addition, there are a total of 80 fish conservation zones.

The government defined forest categories (production, protection and conservation forests) into three categories that are represented in Xieng Khouang Province (Source: 5 years (2015-2020) report of PPI of Xieng Khouang province):

a) Conservation forest

The province has two national level Conservation Forests (National Protected Areas [NPAs]): Phou Sa Bot - Phung Chong NPA covering two districts: Kham and Nong Het with a total area of 149,000 ha (18.7 percent total land area) and a small proportion of Nam Et - Phou Leoi NPA (8,000 ha) bordering Huaphan and Luang Prabang provinces.

b) Protection forest

The Protection Forest category serves mainly as watersheds/catchments with a total area of approximately 761,200 ha

c) Production forest

Production Forests cover three main areas: Nam Ngiep - Nam Jong, Long Khan – Long Khao and Nam Mo totalling 310,600 ha

3.4 Geographical Characteristics

The physical characteristic of Xieng Khouang province could be divided into 3 types:

- Mountain area covers 90% of total natural land of the Province;
- Plateau area covers 8% of total natural land of the Province;
- Plain area covers 2% of total natural land of the Province. This area is dedicated to agriculture activities, mainly for food production.

The altitude ranges between 500 and 2.280 m, but some mountains located at Khoune and Mormai districts can reach 2.620 m (Samsum Mountain).

Based on to the physical characteristics, the Province can be divided into 3 levels as below:

- High mountain areas: over 1.000 m, covering 70% of total natural land of the province;
- Middle and low mountain area: between 700 and 1.000 m covering 20% of total natural land of the province
- Low area: below 700 m covering 10% of total natural land of the province.

3.5 Geological Characteristic

Based on the result of soil survey and soil classification of Ministry of Agriculture (MAF) in 2018, and based on to the soil sampling analysis for 39 points with 106 examples in 7 districts of the Ministry of agriculture and rural development of Vietnam, the geological characteristic (soil types) of the Province is the following:

- Acrisols (AC): about 625.042 ha, covering 49,14% of total natural land of the province, of which the area used for agriculture is 95.102 ha, mainly is at Phoukoud district (218.260 ha) and Mormai district (101.456 ha);

- Alisols (AL): 154.557 ha of total natural land of the province, of which the area used for agriculture is 29.178 ha. These soil type is found in all districts but is more common in Mormai district (51.888 ha) and Kham district (32.199 ha) and Pek district (24.720 ha).
- Luvisols (LV): 317.799 ha, covering 24.98% of total natural land of province, of which the area used for agriculture covers 40.258 ha. This soil type is scattered in all districts but is much more located in Nonghet district (148.485 ha), Kham district (96.174 ha), and Mormai district (44.231 ha).
- Cambisols (CM): 115.610 ha, covering about 9,08% of total natural land of the province, of which the area used for agriculture is about 39.884 ha. This soil type is scattered in all districts but have much more presence in Khoune district (40.098 ha), Phoukoud (17.392 ha) and, Phaxai district (15.082 ha).
- Lixisols (LX): 9.682 ha, covering about 0,76% of total natural land of the province, of which the area used for agriculture is about 469 ha. This soil type is mainly found in Khoune district (9.145 ha) and Phoukoud district (537 ha).
- Leptosols (LP): 28.881 ha, covering about 2,27% of total natural land of the province, of which the area used for agriculture is about 6.450 ha, This soil is mainly found in Nonghet district (9.652 ha), Phoukoud district (7.740 ha), Mormai district (2.355 ha), and Kham district (1.969 ha).

Table 4. *Soil suitability to the main crops, Xieng Khouang Province*

District	Rice			Annual crop			Fruit tree	Grass
	S1	S2	Total	S1	S2	Total	S2	S2
Kham	6 636	903	7 539	12 921	13 841	26 762	13 020	10 895
Khoune	59	4 548	4 607	269	18 623	18 892	3 783	1 895
Mork Mai	104	1 557	1 661	725	7 114	7 839	1 765	1 039
Nong Het	70	40	110	1 010	2 983	3 993	1 322	219
Pek	906	6 575	7 481	11 732	22 023	33 755	29 116	27 163
Phaxai	-	2 769	2 769	869	7 928	8 797	7 332	4 564
Khoud	434	2 799	3 233	868	23 267	24 135	18 993	13 724
Total	8 209	19 191	27 400	28 394	95 779	124 173	75 331	59 499

S1 : Good suitable, S2 : Suitable; Source : Lao-Vietnam cooperation project, Report (2018), Agriculture land zoning projects of two provinces, Houaphan and Xieng Khuang

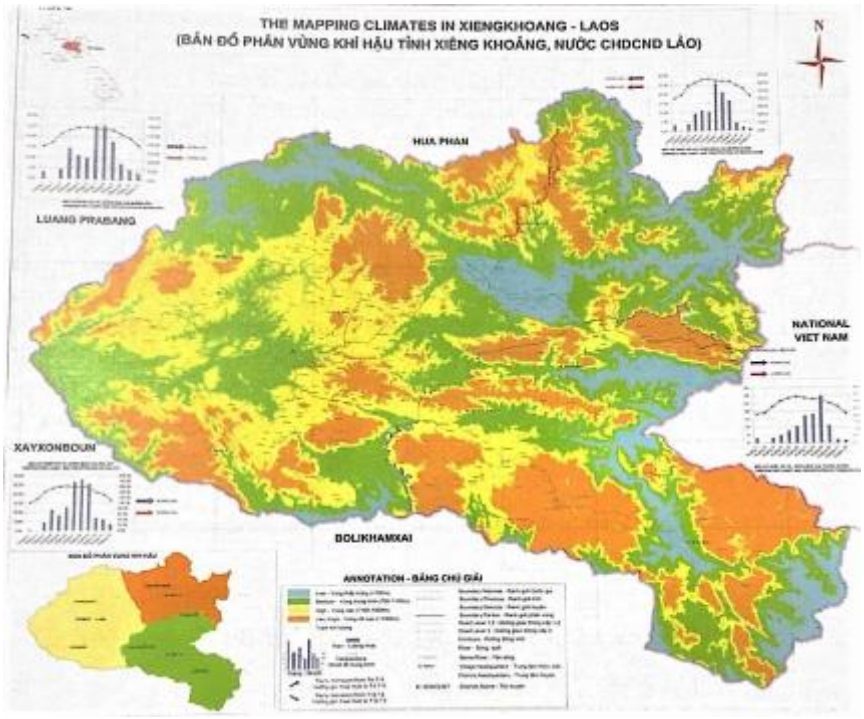
3.6 Climate and hydrology characteristics

Climate

Xieng Khouang is characterized by a humid tropical climate. The average temperature during the year is 20.60C and average moisture is 70%. The rainfall is 1,500 mm/year and the province experiences two seasons:

- Dry season, from November to March. The average temperature during this period is 17.7°C and it is particularly cold in January and February.
- Raining season, from April to October. The rainfall peak occurs from July to September, representing about 90% of total rainfall of the year. The average temperature during the rainy season is 23.6° C.

Figure 5 The mapping climates in Xieng Khouang Province



Source : Lao-Vietnam cooperation project, Report (2018), Agriculture land zoning projects of two provinces, Houaphan and Xieng Khuang

3.7 Hydrological system

The river system of Xieng Khouang province is quite dense due to its geographic physical condition. The main rivers are Ngum, Xan and Gnam (all of these rivers flow to Khong river). Other rivers are Nuern, Mo, Mat, Khien (all of these flow to sea via Vietnam).

This river system is the main potential of water for irrigation and livelihood of people.

3.8 Agricultural production

Agriculture is by far the main economic sector. Provincial authorities' priority is to increase the production of commodities in order to ensure food security and improve economy of the province. Main commodities for food security mainly rely on lowland rice, upland rice, and vegetables, which ensure self-sufficiency of the province.

Commercial crops are mainly characterized by maize, "khao kai noi" rice variety, vegetables (including clean, organic and GAP vegetables) and cattle and buffalo. In addition, private companies play a big role in agricultural concession activities such as dairy and meat farms and orange farms.

Hybrid maize monoculture in Xieng Khouang province, notably in Kham basin, started in the early 2000's and has increased rapidly as a result of a high market demand in the neighboring countries (Vietnam, China) where maize is used as feed for a growing livestock industry. Intensification of maize cultivation has led to adoption of several technologies: introduction of new hybrid seeds, soil tillage with tractors, herbicides, mineral fertilizers, service provision for land preparation and herbicide spraying…Since 2015, a partial abandonment of maize cultivation is observed with maize cultivated area and production decreasing down to about 10,000 ha and 50,000 tons in 2018 (Lienhard, 2020).

Table 5. Main food and commodity production in 2020

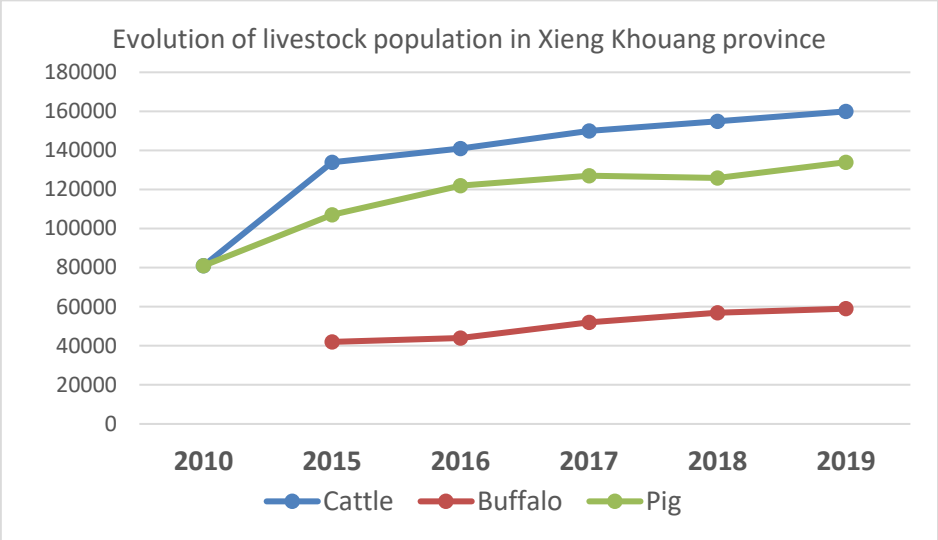
No	Item	Tons
1	Agricultural production	
	Total of Food production	**163.640,0**
	Lowland rice	75.350,0
	Upland rice	15.770,0
	Irrigated paddy filed	640,0
	Sweet Corn	3.490,0
	Root crops	40.440,0
	Vegetables	27.930,0
2	Cash crop production	
	Maize for animal	106.150,0
	Coffee	115,0
	Green Tea	650,0
	Jobs Tear	6.240,0
	Chilly	3.640,0
	Beans	1.150,0
	Fruits	11.810,0
	Sugar cane	1.630,0
	Ginger	3.930,0

Source: Agriculture department (PAFO), Report of implementation plan of 2020 and plan for 2021

Cattle herd has increased in Xieng Khouang by approximately 9 percent per year over the period 2009 - 2018. The cattle herd is currently estimated at 160,000 animals. The most common husbandry practice is to allow animals to graze freely along roadsides, in natural pastures, fallows and post-harvest rice fields, and in forested areas.

Pig raising seems also important in XKG. Farmers used different races and crossed breed such as indigenous breed (fatty pig), exotic breed (Large white, Landrace and Duroc) and improved breed (Black pig). Pig diesease are also presented in Xiangkhouang provice for example African swine flue, classical *swine* fever (*CSF*) and *Porcine* Reproductive and Respiratory Syndrome.

Figure 6. Evolution of livestock population in Xieng Khouang Province



Source : PAFO, 2020

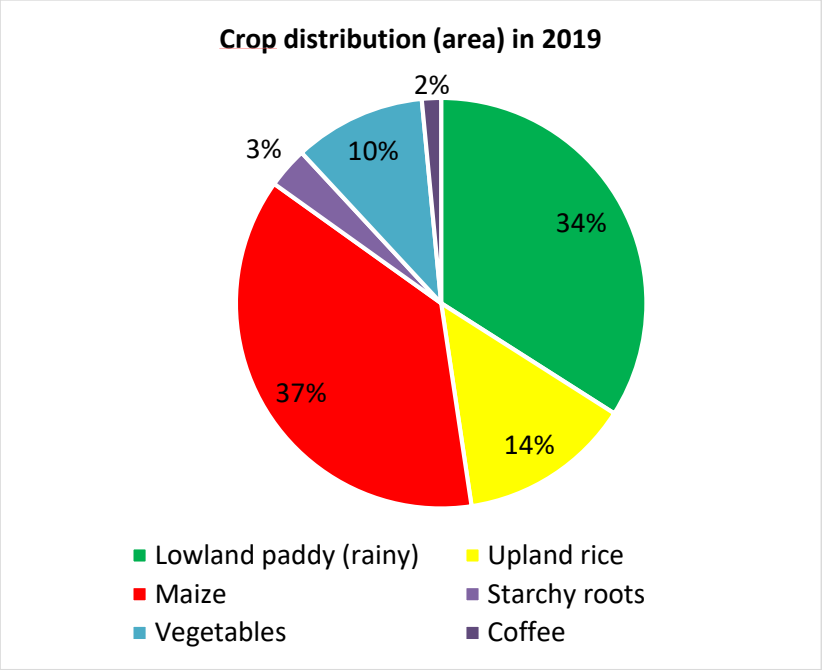
Table 6. Cultivated areas of staple crops from 2016 to 2020 in Xieng Khouang province (ha)

	2016	2017	2018	2019	2020
Staple crops					
Total Rice	26796	27295	27921	27144	25477
Secondary paddy	0,0	0,0	6,0	42,0	161,0
Lowland rainfed paddy	19300	19675	19759	18946	17960
Upland paddy	7496	7620	8156	8156	7356
Sweet corn	269	320	311	1003	470
Sweet potato	62	98	90	273	179
Taro	537	484	475	1265	734
Bean	565	614	600	608	664
Vegetable (leaves)	1395	1373	1330	1316	1190
Vegetable (others)	205	249	289	245	307
Cabbage	126	76	95	162	112
Onion	425	255	268	242	300
Garlic	540	862	590	680	493
Ginger	48	201	210	195	223
Chilly	559	550	639	641	658
Cash crops					
Maize for animal	20600	20873	20900	22212	21206
Sugar cane	92	79	75	135	163
Orange	20	65	65	65	105
Plum	182	182	190	221	225
Jobs tear	0	0	0	1249	1555
Asian pear	81	97	100	103	90
Coffee	50	368	387	388	412
Tea	127	291	291	469	447
Mango	84	95	98	95	97
Cassava	1236	1139	1139	1139	906
Banana	486	486	550	538	441
Cucumber	86	97	101	134	115
Papaya	32	40	40	51	35
Watermelon	88	185	90	57	54
Mulberry for silk production	45	690	90	73	48
Pineapple	51	71	72	118	91

ແຫ່ງຂໍ້ມູນ: ສະຖິຕິກະສິກຳ 2006-2020, ຂ/ຫ ແຜນການ ແລະ ການເງິນ, ພະແນກກະສິກຳ ແລະ ປ່າໄມ້ ແຂວງ ຊຽງຂວາງ

Source: Agricultural Statistics 2006-2020, Provincial Department of Agriculture and Forestry (PAFO), Xieng Khouang Province

Figure 7. Crop area distribution in 2019



Source: PAFO, 2020

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	3
1.2 Challenge #2: Rice-based systems in lowlands: Sustaining rice production as the cornerstone of food and farming systems	1.5
1.3 Challenge #3: Crop-livestock-forest in rainfed uplands: Preserving uplands from social and environmental degradations	2.5

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

Challenge #1: Agriculture systems connected to urban areas: Feeding booming cities through safe and fair food circuits

The main commercial commodities of the Province, maize, fruits and cattle, are mainly exported to China and Vietnam. Phusan tea has been commercially successful in China markets since 2008. Selected quality coffee beans are exported to USA.

As trade between the Laos-China and Laos-Vietnam borders became heavily restricted since 2020 due to Covid 19 pandemic, Chinese and Vietnamese wholesalers are no longer able to cross the border and purchase their products. Some products like Phusan tea and high-quality coffee are now packaged for the domestic markets (see photos), and main clients of local farmers moved from wholesalers to retail market, coffee shops and restaurants in cities like Luang Prabang and Vientiane.

Photo 1 Phusan tea and Mueang Xieng coffee for Lao market

Photos by Stéphane Guéneau, Cirad

According to TABI (2020), Khao kai noi rice production is about 51,300 tons/year on about 12,000 hectares of land. About 60% of Khao kai noi rice production is consumed at home by small-scale producers' households. The part of the production that is not self-consumed is sold in bulk in Phonsavan wholesale shops (about 20% of the production) and is commercialized elsewhere in the country or on foreign markets (small volumes, mainly in China and Vietnam).

As this rice has exceptional taste and aroma compared with most other glutinous rice varieties, demand is growing strongly in the largest cities of Laos. Some of Khao kai noi rice production is in the process of receiving organic certification. In addition, a geographical indication has been registered and the producers who are members of the Xieng Khouang KKN Rice Promotion Association have implemented an internal control system in order to obtain the GI certification for the next harvest in 2021.

Photo 2 Khao kai noi rice sold in bulk in Phonsavan

Simple khao kai noi packaging developed by SAEDA supported farmer groups in Xieng Khouang province; Khao kai noi packaging with 100% organic mention for retail market in Vientiane

Photos by Stéphane Guéneau, Cirad

Clean agricultural policy is implemented in Xieng Khouang province. There is a permanent organic market in Phonsavan district. Existing organic vegetable association stimulates farmers to produce safe vegetables and open opportunity for farmers to access this market. In addition, organic and GAP vegetables are shipped to Vientiane capital and Luang Prabang province for retail sale in conventional and organic markets, supermarkets and restaurants.

Fruits are mainly sold in Xieng Khouang, with some of them (mainly plums from Nonghed District) supplying the Vietnamese and the big cities of Laos (Vientiane and Luang Prabang). The mission did not visit the district of Nonghed, but according to PAFO, it exists some opportunities to create linkages between Xieng Khouang producers and organic markets in Vientiane.

Photo 3 Certified organic vegetable farm in Pek district

Photos by Stéphane Guéneau, Cirad

Challenge #2: Rice-based systems in lowlands: Sustaining rice production as the cone of food and farming systems

In lowland areas, vegetables, rice, fruit trees and rainfed agriculture are dominantly present in Pek, Kham and Khoune districts. Some vegetable farmer groups have implemented good agriculture practices (GAP) in order to be reach GAP certification. Organic standards are applied for vegetables in some areas. Integrated crop-livestock farming systems (Khao kai noi rice, vegetables, cattle and buffaloes) have been implemented by some farmer groups, using agroecological techniques

Photo 4 Integrated crop-livestock farming systems in Ban Kong. Kham district. Organic manure.

Photo by Stéphane Guéneau, Cirad

Khao kai noi rice is grown in valleys or on low slope areas with fertile land surrounded by mountains. According to some reports (Walker, 2020), an estimated 46.683 MT/year of paddy khao kai noi rice is produced in Xieng Khouang. This variety of rice would account for about 40% of the area planted in the province. Khao kai noi rice production is concentrated in the central and eastern part of the Xieng Khouang Plateau. Khao kai noi rice production area covers Pek district and extends mainly to Kham and Khoune districts. Most of this rice is produced without pesticides and chemical fertilizers. Lowland rice crops are flooded during the wet season. The presence of mountain ranges on the outskirts of the production areas provides significant water reserves for its cultivation. In addition, irrigated areas were extended to promote rice production. In addition, Chinese and Vietnamese investments have led to the creation of big farms. For instance, a large-scale milk production farm has been settled in Pek district. It is GAP certified and plans to qualify for organic certification.

Photo 5 Paddy fields, Xiengh Khouang province

Photo by Stéphane Guéneau, Cirad

In addition, Chinese and Vietnamese investments have led to the creation of big farms. For instance, a large-scale milk production farm has been settled in Pek district. It is GAP certified and plans to qualify for organic certification.

Photo 6 Large scale milk farm, Pek district

Photos by Stéphane Guéneau, Cirad

Challenge #3: Crop-livestock-forest in rainfed uplands: Preserving uplands from social and environmental degradations

In upland area, rice-based subsistence shifting cultivation have been substituted by commercial market-oriented systems in the 2000s. Hybrid maize cultivation systems has played an important role to decrease poverty in Xieng Khouang province. Many Chinese and Vietnamese companies set up collecting points and install maize dryers. Maize is exported to China and Vietnam for animal feeds. Although intensive hybrid-maize monoculture has contributed to reduce rural poverty in Laos and particularly in Xieng Khouang province, a growing number of smallholders are currently facing declining yields due to soil fertility degradation, indebtedness, and emerging health and environmental concerns related to herbicide over-use. Moreover, farmers are increasingly confronted with invasions of Fall armyworm (*Spodoptera frugiperda*) over the past few years.

All these constraints contribute to a progressive abandon of maize cultivation as farmers are looking for alternatives in order to maintain their income. While maize remains an essential crop for many smallholders in Kham and Nonghet districts, farmers have started to invest in other agricultural activities, notably forage crops to intensify livestock activities. This diversification has led thus to a partial abandonment of maize cultivation. Maize fields were converted to pasture areas, and/or turned into paddy fields where possible.

Cattle fattening has become an important source of income of farmers in Xieng Khouang province. In addition, animal manure from fattening cows was used for composting and returned to vegetable and rice fields.

Photo 7. Tea, coffee, and honey production, Xieng Khouang province

Photos by Stéphane Guéneau, Cirad

Tea and coffee plantations have significantly expanded in recent years in the uplands (but so far, areas remain limited). The farmers do not use pesticides. However, pest control remains their main challenge - for coffee production in particular. In some places, honey production complements diversified production systems. It is a very profitable product which completes the farmers' incomes.

4.2 Opportunity for change and for impact

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

❖ **Limits from current agricultural and food systems are clearly perceived and acknowledged by local stakeholders**

Various strategies such as the Agricultural Development Strategy 2021-2025, the Vision to 2025, the National Green Growth Strategy, the National Nutrition Strategy, have been elaborated and implemented at the local level. Limits related to conventional agriculture and associated food systems, (soil depletion due to intensive monoculture practices, water contamination and health risks from pesticides, etc.) are well identified in provincial and district strategic documents. The application of the Green Strategy at the provincial level has led to the implementation of actions to inform farmers about the risks caused by pesticides on human health, as well as education programs for producers to reduce the quantities of pesticides, to implement good agricultural practices, to collect chemical containers, etc. However, the dissemination of these strategies is not widespread throughout the territory. While these strategies are frameworks for action at the provincial level, they appear to be less understood and applied at the district level.

Farmers are aware of the GAP and organic standards and some apply them. There is an organic vegetable association and an organic market. But some farmers still choose to use agrochemicals to increase productivity and protect crops from pests. They usually use both agrochemicals and organic compost. The difference between Good Agricultural Practices (GAP) that the government would like to impose as a standard and conventional agriculture is not always well understood by some farmer groups.

❖ **Opportunities, constraints, and potential levers for change identified by local authorities**

Opportunities:

Declines in soil productivity of maize crops have led producers to change their behavior and seek to develop more diversified farming systems. Producers have a tradition of agriculture and raising animals and are not reluctant to change their production system. Soil improvement techniques and livestock fattening have been implemented in some areas. There is enough space for planting and rising animals. For instance, there are existing technical standards for more sustainable maize-based cropping systems (e.g. maize-legume mixed cropping systems) that could be adapted and promoted in Xieng Khouang province. Farmers could take advantage of the richness represented by the range of existing legumes species that are neglected and underutilized (NUS) in Lao PDR.

There are (and were) many projects linked to agroecology and safe food systems, such as: LURAS, EFICAS, TABI, USAID, SME, Lao Farmer Network, IFAD, GIZ, CEGGA, ADB… Farmers have various opportunities to participate in training courses, exchange knowledge-experiences and study tours. Technical trainings on agroecology (improvements in production techniques or capacity building of producer groups) are implemented but also more general trainings that aim to improve management, marketing systems and group organization. Various producers have gained their knowledge and applied it to their own production to improve their practices.

Local authorities have also started to invest human and financial resources to promote a more sustainable agriculture in Xieng Khouang province through for instance the set-up of a PAFO team who is mandated since 2014 by the governor of Kham district to provide responses to the land degradation issues faced in the district, the sustainability of the Technical Services Center in Ban Poa in Phaxay district.

Organic vegetable production has expanded with the creation of a regular local market and increased national demand. The market demand for safe food has led to the emergence of a generation of agricultural entrepreneurs focused on clean and organic agriculture. Groups of producers trained and familiar with agroecological techniques are already being formed. With the support of well-trained PAFO teams and some NGOs (SAEDA), some villages have become model villages of agroecological production.

Seed conservation and production projects have been developed (Khao Kai Noi rice). There are coffee and tea plantations contributing to the conservation of agrobiodiversity. Several producers have developed honey production, which helps to maintain bee populations and conserve biodiversity.

Constraints*:*

Some structural limitations, such as those related to social evolution, natural conditions (climate, topography) or market instability, are difficult to overcome. For instance, commodity prices are volatile, successor youth labour is more and more limited, access roads to the area are still difficult during the rainy season and transportation is still expensive.

Other limitations are related to the lack of knowledge and information. Food safety is a new challenge for PAFO, DAFO and health authority. Currently, PAFO and DAFO have clean agricultural policy in place, and they can train farmers on GAP and organic agriculture. But, they still lack testing capacities. Access to information on food consumption for nutrition is not widespread. Techniques and tools for the dissemination of innovations are still lacking. Product processing techniques and breeding process are not well understood by some producers. There is a lack of knowledge on plant protection and animal disease prevention.

Finally, various agroecological and food nutrition and food safety projects have been implemented for the last 10-20 years, but there are few synergies and mutual reinforcement among these projects.

The following potential levers for change are identified:

- Create successors by alternating the children of farmers who are interested in farming to training or study in agricultural professions;
- Participatory technology development and extension of best models for agriculture, women empowerment, and training on good child care practices, governance at community level.
- Develop good coordination mechanisms for health, agriculture, education and women' union to collaborate in providing nutrition services.
- Apply methods that change attitudes on nutrition and food habits, improve food processing and diversify consumption through coordinated efforts of all parties concerned.

- Build partnerships with private sector and strengthen entrepreneurship among producer groups to develop niche value chains for competitive food products for local consumption and export.
- Develop strong nutrition plans at all levels, aligned with socio-economic development plans, with clear activity plans and budgets assigned, clear indicators and clear monitoring guidelines and devolved responsibilities.
- Build human resources so that government staff can service rural communities adequately with nutrition counselling services, supplement government staff with NGOs and village volunteers.

❖ Opportunities, constraints, and potential levers for change identified by producers

Opportunities:

Due to the proximity of rice research centres and stations, farmers in Xieng Khuang have many opportunities to access improved rice varieties.

Farmers benefited from training through various projects (EFICAS, LURAS, TABI…) and the support of well skilled PAFO and DAFO officers: on organic compost, biofertilizers, packaging, forage technologies.

There is a strong demand for safe and organic products, especially for rice, vegetables and coffee, and the marketing channels are well developed.

Constraints:

For organic and GAP products, prices offered by traders and consumers are the same as products cultivated under conventional practices. At present, this lack of premium is compensated by subsidies allocated by projects. Yet, the lack of price-premiums discourages farmers to increase their agroecological production.

Some Chinese investors just want to collect the commodities and offer low prices. They are not interested in developing higher value-added quality products locally.

As some agroecological transition initiatives (e.g. crop diversification) are quite news, markets are still limited. Perishable products such as vegetables have difficulty being marketed. Lack of market outlet for legumes is a barrier to farmer's adoption of maize-legumes mixed cropping systems. Other niche products (e.g. tea, coffee, Khao kai noi rice) are still seeking to enhance their qualities through differentiation systems (brands, packaging, labels), but the markets for these products are not yet well established.

Regarding organic production systems, farmers are willing to join the organic producer association. However, recruitment of new members is still limited due to distance, training and technical assistance. Some farmers are looking for rapid solutions for disease control. They prefer to apply pesticides because it is an easier solution to implement.

Adoption of maize-legume mixed cropping systems is still limited as farmers have difficulties to sell legumes (limited market) and cultivation needs complementary work.

Introduction of cover crops and/or relay crops, notably during the dry season, generates conflict between crop and livestock on land and biomasses use. Animal roaming after maize and rice harvests is a constraint for the preservation of these new crops as these agricultural systems require labour and money to protect the vegetal biomass (e.g. fences) from livestock.

Internet coverage in rural areas is acceptable but could still be improved to provide more ways to access technology and information, especially through tutorials that exist on social networks and online media (Facebook, Youtube, ...).

The following potential levers for change are identified by the farmers:

- Recommend and introduce flood resistant rice variety to farmers especially in flood prone areas
- Support rice farmers to produce more quality rice to supply to rice mills
- Support to connect with traders (legumes)

❖ Opportunities, constraints, and potential levers for change identified by other market system actors

Opportunities:

Several producer groups have been created and would like to increase their business: coffee producer group (Keoset community coffee), tea producer group (Phousan tea community), organic vegetable group, bee raising group, Khao kai noi rice association. These groups are already familiar with agroecological techniques and instruments for valuing safe value chains, such as GAP and organic certifications.

Various young agro-entrepreneurs are dynamics and ready to apply technical and market innovations. In Kham district, a Chinese company that started to buy industrial maize is the company is now join-ventured with Lao young entrepreneur to promote diversified production systems (beans, chilli, sweet corn, groundnuts, sweet potatoes). They bought land, have built a storage house and conclude contact farming with local farmers with guaranteed prices, providing seeds, fences and techniques. The company also introduces irrigation systems however, it is still a new technology for farmers.

Xieng Khouang is not far from Vientiane. It is a gateway to northeast part of Laos. There are several market opportunities: farmer producer could easily access to the market by themselves. Vientiane market is not so far and a local organic market already exist in Phonsavan. Market access is easy even if some resources (wild Phusan tea) are located in remote areas.

Photo 8 Left: Farmer groups in the process of achieving GAP certification Ban Tam, Khoune district; right: young entrepreneur implementing new irrigation system Kham district

Photos by Stéphane Guéneau, Cirad

Constraints:

Some producer groups lack infrastructure, such as the Phusan tea producer group.

Some organic vegetable producers are distant from markets and have difficulty selling their products.

Processing and marketing is still very limited. Most of the products marketed are primary or minimally processed products, sold in bulk. There is a clear lack of knowledge about processing, packaging, promotion and marketing.

A large proportion of farmers do not yet understand the principles of organic agriculture or GAP; they lack knowledge of plant protection, breeding and animal disease prevention.

The producers do not always pay attention to the quality of the products.

The following potential levers for change are identified:

- Create pastures to develop animal husbandry.
- Create partnerships with the private sector
- Strengthen entrepreneurship among producer groups to develop niche value chains for competitive food products for local consumption and export.

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	2.5
3.3 Institutional innovations	2.5

A total score <3 is eliminatory

❖ Technical innovations

Clean agricultural policy has been put in practice in Xieng Khouang province, resulting in several technical innovations implemented in various areas in the three districts visited:

- Organic and GAP vegetables production. Farmers are trained to implement organic production systems (bio-compost and biofertilizers production, etc.). Semi-organic practice or GAP vegetable practices are also common in Khoune district. All these technical innovations are promoted by PAFO, DAFO, and SEADA support, through trainings, financial support and exchange of experiences.
- Crops-livestock integrated management. Cattle fattening, promotion of forage species, development of seed forage market are implemented with the support of PAFO.
- Crop diversification based on conservation agriculture and agrobiodiversity. Various technical innovations that aim at diversifying the production systems were/are supported by EFFICAS, TABI and LURAS projects with the technical assistance of PAFO officers: maize-legume mixed cropping systems, rice-vegetable and rice-garlic associations, honey production, collection of non-trade forest products (NTFP) such as mushrooms and bamboo.
- Support to recycling chemical wastes in the maize production area. This action is supported by LURAS project with the assistance of PAFO officers.

- Agroforestry. Various initiatives have been implemented to improve the coffee production techniques like coffee and banana integrated agroforestry, cover crop and good practice production.
- Rice Cropping agroecological Techniques. With the support of SAEDA (local NGO) some farmers are implementing innovative Rice Cropping Techniques based on Sustainable Rice System (SRS) technique in the district of Kham.
- Khao kai noi rice geographical indication (GI) and organic production. Farmers are interested in developing Khao kai noi rice organic production systems. They are making their own bio-compost by using their manure from cattle and poultry. They also bought a grass cutting machine to make bio-compost from *Crotalaria Juncea* production, in order to improve the soil of paddy fields. The rice farmers disseminate this compost production techniques to the neighbouring families and villages.

❖ Organizational innovations

The technological dimensions of innovation for agroecology and safe food systems have been implemented in Xieng Khouang in parallel of the emergence of new modes of organization:

- Khao Kai Noi Gl Management Association of Xieng Khouang province (KMA.XKH) has been established in 2016. In 2020, 66 rice producer families are members of the association.
- Organic Farmer Association (OFA) in Pek district is the association that market vegetables at the provincial organic market two days a week.
- Laos Farmer Association for Sustainable Agriculture Production (FASAP) was established in 2006 in Khoune District. It is one of the oldest farmer organizations member of Lao Farmer Network. FASAP aims at promoting sustainable agriculture, including organic agriculture, and is in the process to create an agriculture cooperative on vegetable and rice.
- Hoi Vegetable Cooperative in Khoune District produce variety of vegetables and maize for markets in big cities. Although they are not organic certified yet, they are applying good agriculture practice using minimal fertilizer and almost zero pesticides.
- Farmer Association of Khangvieng, in Khoune District includes seven villages that produce rice and vegetable. They have trained their members on organic rice production.
- Wild honey production groups are supported by The Agro-Biodiversity Initiative (TABI) in three districts (Pek, Phoukoud and Khoune). They have not yet created an association, but the Bee Keeping Center of Xiengkhouang located in Phonsavan supported by TABI and PAFO functions as an association.

❖ Institutional innovations

In the field of agroecology and safe food systems, a certain number of innovations can be considered institutional innovations insofar as they have modified the relations between actors by establishing new norms and routines that guide their behaviours. In Xieng Khouang, these institutional innovations concern first and foremost the question of control over production systems and product quality. SAEDA, a local NGO, supports 5 farmer groups for organic agriculture that have set up internal control systems (ICS) to control the application of organic standards at the village level. DAFO staff implements the external inspection using written forms, and Lao certification body grants the certification. Moreover, PAFO supports also some innovation such as GAP activities in order to increase GAP certification that could be a major tool to strengthen the relations between the producers and the buyers. Even if they are not

certified by a third-party, several farmer groups are conducting inspections to control the application of good agricultural practices.

Some innovations have also been applied in order to enhance the value of the agroecological attributes of products in marketing channels. Rather than applying specific brands or labels, well-identified "agroecological" or "socio-environmentally-friendly" selling places have been set up in the province, such as the agroecological booths in the Phonsavan market or the Bee Keeping Centre for sustainable industry of Xieng Khouang.

This Centre was founded in 2019 with the support of TABI project and PAFO. Actually, it focuses more on processing, packaging, and marketing of "sustainable products, including honey, tea and coffee from Xieng Khouang rather than on technical assistance on bee keeping. The Centre is a point of sale which provides information about the sustainable projects in the Province and the agroecological products. Some innovative initiatives and products like "From bomb to beans" coffee are visible in this Centre.

Photo 9 Bee keeping centre, Phonsavan, Xieng Khouang Province

Photos by Stéphane Guéneau, Cirad

4.4 Opportunity for partnerships

Sub-criteria	Score
4.1 Number and diversity of potential partnerships	3
4.2 Flagship accessibility	2

❖ Number and diversity of potential partnerships

There are various potential partners including public, private, international and non-governmental organizations, social organizations, research institutes, academic institutions for participating in the implementation of ASSET project.

Local stakeholders, including PAFO and DAFOs, local NGOs (in particular SAEDA), producer associations (OFA, KMA-XKH, FASAP, Phusan tea farmers) and value-chain actors (rice traders, coffee packagers, local young entrepreneurs) are interested in participating in the strengthening of agroecological and food security research and capacity building activities.

❖ Flagship accessibility

Accessibility of Xiang Khouang province is suitable for field research activities. During the dry season, this province is about 5-6 hours distant from Vientiane by car capital and 45 minutes by airplane. The selected districts are accessible between 45 minutes and 3 hours from

Phonsavan city. The main roads in each district are in good condition. Many companies and traders for maize and other agricultural products were set up collecting points and permanent factories in these districts too. However, a lot of innovations regarding agroecology are implemented in mountainous areas and during the rainy season it could be harder to reach these sites.

4.5 Opportunity for co-funding of field activities

Criteria	Score
5. Opportunity for co-funding of field activities	2

Discussions with local authorities and managers of the different projects have shown that there are opportunities for partnership and implementation of joint and complementary of field activities, especially with regard to capacity building of local stakeholders involved in the implementation of innovations in favour of agroecology and safe food systems. However, the discussion on the financial contribution that could be allocated by each project/partners for the implementation of joint actions with ASSET is difficult to address as it is conditioned by the development of a joint action plan and an agreement between ASSET project and partners potentially involved.

There is a general agreement that part of this contribution could be given in the form of supply services of staff (e.g. support of PAFO or NGO project officers) and provision of premises or vehicles to go to the field.

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

Criteria	Score
6. Local expertise/champions	2.5

The main champions identified by the mission who have acknowledged leadership or competences, have a strong local recognition and leverage power, are interested and could be mobilized to support the transition process are:

PAFO and DAFO program officers who have a very good knowledge of agroecological transition and safe food systems topics and are very skilled; PAFO as an institution has also expressed a strong support to ASSET project and could be an important asset for up-scaling activities implementation as it has a strong experience in exchanging with other stakeholders and a good recognition locally.

Champion farmers and farmers' organizations that are already engaged in technical (vegetable production, livestock systems…), organizational and institutional innovation processes and have a good connection with markets.

NGOs like SAEDA that have implemented projects to support the ecological transition and improve food systems with a good experience on capacity building and dissemination activities.

4.7 Existing data and knowledge

Sub-criteria	Score
7.1 Current land cover and land use, LULC changes and land use trajectories	2
7.2 Local food systems	2
7.3 Agricultural value chains and quality	1,5
7.4 Local livelihoods and livelihood development strategies	1,5
7.5 Situation of youth, women, and ethnic minorities	1,5
7.6 Local policies and rural development strategies	2
7.7 Agricultural extension facilities and strategy	2
7.8 Actors and investment in the agribusiness sector	1,5
7.9 Performance and impact of conventional agricultural systems	2
7.10 Performance and impact of innovative AE and SF systems	1,5

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

A lot of data in Lao language have been collected during the mission: agricultural statistics, biophysical data, policy and project reports, strategic documents regarding agriculture and rural developments, agricultural and non-agricultural trade statistics, nutritional data, GPS data and maps, etc. All these data are visible on:

https://drive.google.com/drive/folders/1oa0EdNQhdPx757RQbDEU0vPqewHx1jcO?usp=sharing

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

It is difficult to estimate the number of potential beneficiaries of the intervention. As many households are involved in agroecological projects and innovations in Pek, Khoune and Kham districts of Xieng Khouang, and also because consumers are directly impacted by these innovations through an easy access to safe products, the intervention may well affect thousands of people in the province

4.9 Environmental and social risks

The status of the Province regarding 5 main environmental and social risks are presented in Table 7.

Table 7. Main Environmental and social risks for Xieng Khouang Province

	YES	NO	Comments
1. Location: Does the site include or is it in close proximity to:			
• A protected area		X	
• A sacred or cultural site	X		• The "Plain of Jars" sites located in Pek and Phoukoud districts have been recognized as World heritage sites by UNESCO in 2019 • "Tham Piou Cave" is a cultural site located in Kham district (a memory of US bombing during the war)
• Wetlands, mangroves		X	
2. Is the project require (land use)			
• A change in land rights (formal or traditional)			Not relevant: flagship site not yet selected
• Economic losses for all or part of the target populations (including informal uses)			Not relevant: flagship site not yet selected
• Increase deforestation			Baseline: Forest cover of 53% in 2019
3. Site Context			
• Are indigenous peoples or traditional local communities present in the project area?	X		Tai Phouane (42.4%), Hmong (44.4%), Khmu (6.3%), Tai dam (4,0%) and Phong (2,8%)
• Are there any protected species or critical habitats in the site?	X		
4. Would the project likely to cause			
• Loss or restriction of access to natural resources (water, timber, gathering)			Not relevant: flagship site not yet selected
• Increases in : o Water requirements, o Erosion risks, o Flooding risks o waterborne diseases			
5. Have local changes due to climate change been taken into account in the project design?			Not relevant: flagship site not yet selected

5. Conclusion

5.1 Scoring results

Table 8. Recap scoring against selection criteria

Criteria	Flagship score	Maximum Score	Flagship score_%
1. Site relevance	7	9	0,78
2. Opportunity for change and impact	11	15	0,73
3. On-going innovations and dynamics related to AE and SFS	7	9	0,78
4. Opportunity for partnership	5	6	0,83
5. Opportunity for co-funding	2	3	0,67
6. Local expertise and champions	2,5	3	0,83
7. Existing data and knowledge	17,5	20	0,88
8. Number of potential beneficiaries	2	3	0,67

Figure 8. Spidergram representation of scoring for Xieng KhouangProvince

5.2 Site average note

Table 9. Site average note

Criteria	Coefficient weighting	Site
1. Site relevance	1	0,78
2. Opportunity for change and impact	5	3,67
3. On-going innovations and dynamics related to AE and SFS	4	3,11
4. Opportunity for partnership	1	0,83
5. Opportunity for co-funding	2	1,33
6. Local expertise and champions	3	2,50
7. Existing data and knowledge	3	2,63
8. Number of potential beneficiaries	1	0,67
TOTAL	**20**	**15,51**

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

Advantages

• High number of AE (OA, IPM, CA, crop-livestock) and SFS initiatives (local organic market, certification, pesticide control,nutrition programmes)

• Champions farmers (livestock, vegetable, rice) & qualified extension officers

• AE market access to Phonsavan, VTE and LPG

Disadvantages

• Lack of synergy between organizations & projects

• Project driven dynamic & limited dissemination and scaling-up

• Potential diversification but limited demand

6. Annexes

Annex 1: List of the main projects and initiatives identified in Xieng Khouang Province

Nb	Project name	Acronym	Intervention type	Main crops/activities	Donor	Period
1	Lao Upland Rural Advisory Service	LURAS	Development	F2F training, market info, certification, residue testing, green extension	SDC	2014 - 2021
2	The Agrobiodiversity Initiative	TABI	Development	Agrobiodiversity	SDC	2009-2020
3	Renforcement et extension du secteur du café du Laos	Recosel 1 & 2	Development	Coffee	AFD	2016 - 2021 2021 - 2024
4	Norther Upland Development Program 3rd Phase	NUDP3	Development	Watershed protection, PLUP, crop diversification	AFD	2021 - 2025
5	Eco-friendly Intensification and Climate-resilient Agricultural Systems	EFICAS	R4D	Participatory LU Planning	AFD, EU	2014 - 2019
6	Fall Army Worm control program	FAW	Development	FAW control	ASEAN	
7	IPM extension program /FFS	IPM-FFS	Development	IPM, Rice		
8	Ban Poa Technical Service Center	Poa TSC	R4D	Conservation agriculture, forages, crop diversificaiton, training		
9	Sustainable agriculture market access development project	SAMADP	Development	Organic vegetable, SRS		2013 - 2015
10	Xieng Khouang organic market		Development			
11	Lao Farmer's products Cie	LFP	Development	Krao kai noi rice, tea		
12	Stocktake of the use of planted forages by smallholder farmers and identify barriers for wider use of planted forages in Cambodia, Laos and Vietnam		Research	Forage, livestock	ACIAR	2019
13	National Program in Agroecology	PRONAE	R4D	Maize, upland rice, forages	AFD	2003 - 2009
14	Sector-based program in Agroecology	PROSA	Development	Scaling-up strategy	AFD	2007 - 2011
15	Promotion of Organic Farming in Laos	PROFIL	Development	Organic farming, standards, certification, training	Helvetas, Happel foundat°	2004 - 2011
16	Clean and Climate-smart Banana systems	CLIMB - RECOSEL2	R4D	Banana-coffee, diversification, agrobiodiversity	AFD	
17	Clean Agriculture Development Project		Development	Clean agriculture, market	JICA	2017 - 2022
18	Geografic Indicator Khao Kai Noy rice	GI	Development	Trade and label	AFD	2020-2024
19	Laos Microenterprises		Development	Market, public-private dialogue	USAID	
20	Northern Smallholder Livestock Commercialization Project		Development	Livestock sale	ADB, IFAD	2014 - 2021
21	The Strategic Support for Food Security and Nutrition Project (SSFSNP) (2017-2022)	SSFNSP	Development	Nutrition, farmers groups organization, market, climate-adapted agriculture	IFAD	2017 - 2022

Annex 2. Summary of the visits and available documents

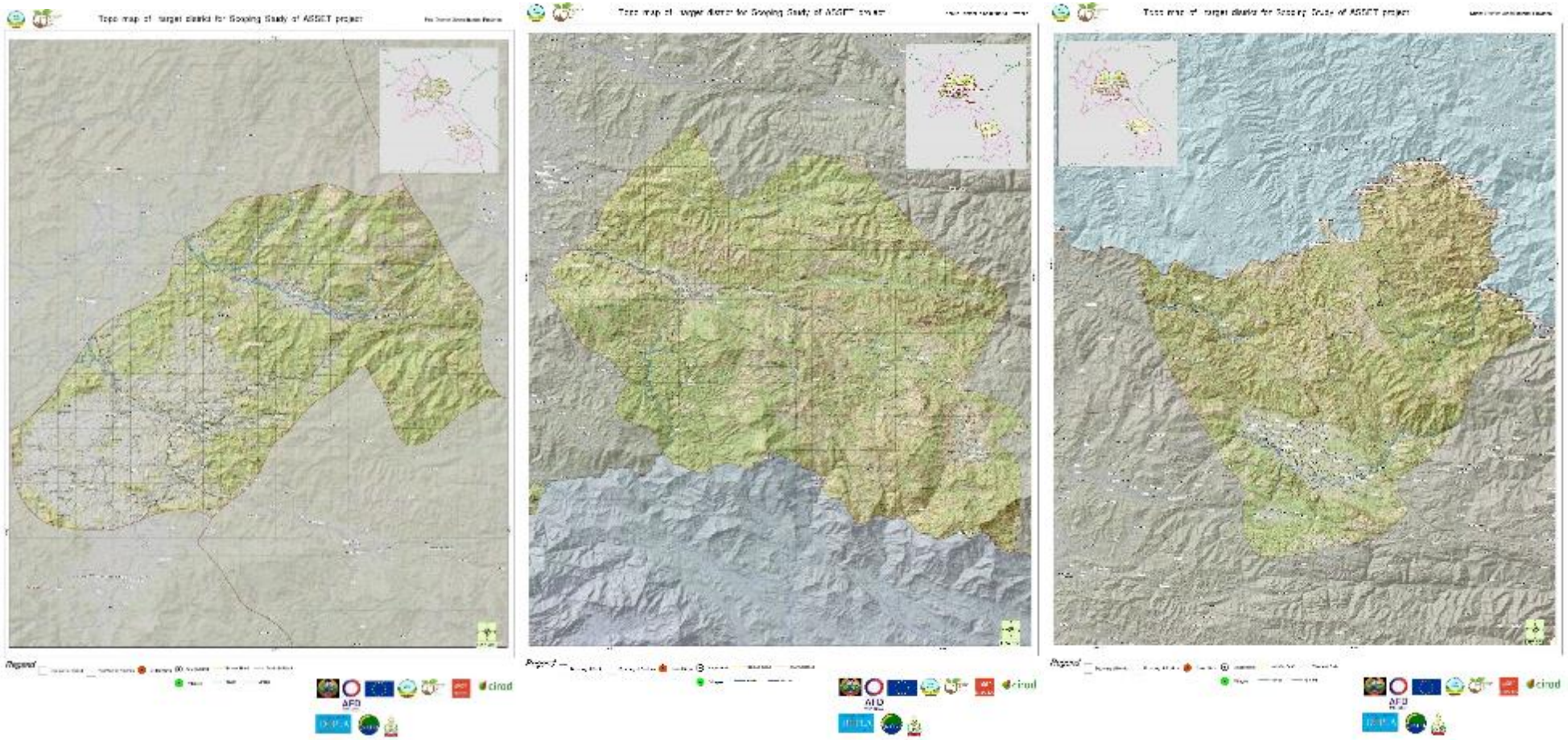
No	Date	Active items	Location	Participants	Data
1	31/01/2021	Travel	Vientiane to Xieng Khouang province		
2	01/02/2021 Morning	Meeting with DG-PAFO-XKH	PAFO- Xieng Khouang province	Inform the purpose, work plan of the team to PAFO	
	01/02/2021 Morning	Interviewed PAFO	PAFO- Xieng Khouang meeting room	Representing the Planning and Investment sector: Informant: Mr. Inthalaphone (soft copy documents)	1) Table 5: Estimated production and consumption of Xieng Khouang province rice 2021 2) Table 3: Production Report 2020 3) Summary of rice production in 2020 (by district) 4) Schedule of domestic investment of agriculture and forestry 5) Schedule of the international investment of agriculture and forestry 6) Summary table of domestic and foreign investment in agriculture and forestry of the Department of PAFO 7) Schedule of domestic and foreign investment in Livestock 8) Schedule of domestic and foreign investment in agriculture 9) Summarize all investments in agriculture and forestry in Xieng Khouang Province 10) Table: Summary of number of production groups in 2014-2019 (missing located point of each group information)
				Representing the agriculture sector_PAFO: Informant: Ms Khanthary (soft copy documents)	1) Summary table Information of farmer organizations (Fos) 2) Report of the implementation for the year 2020 and the direction the plan year 2021 3) Report of the implementation for the year 2019 and the direction the plan year 2020
				Represenating the Administration sector_PAFO: Informant: Mr. Somkhouan (soft copy documents)	2) 10-year report on the implementation of the TABI project

No	Date	Active items	Location	Participants	Data
				Represenating the Agriculture Land Management and Development sector_PAFO	1) GIS information on land use plan Shp_FLUMZ 2) Current land use data (Shp _CLU) ? 3) Report on the annual agricultural land zoning project (Cooperation Program - Lao-Viet)
				Represenating the Livestock sector_PAFO	
				Rural development and cooperatives sector-PAFO	
				Represenating the Irrigation sector_PAFO	
		PAFO Planing and Investment		Represenating the Planing and Investment PAFO-XKH	1) Interview transcript 2) chapter of the report / plan / strategy department (not document / data)
		Department of Health		Department of Health	1) Interview transcript
	01/02/2021 Afternoon	Interview various groups / entrepreneurs	Pek District Organic Vegetable Cooperative	Ms. Bouachan Chairman of the cooperative	1) Interview transcript 2) Report / plan / strategy (not yet documented / data available)
			Natural Tea Production Group	Mr. Yierya head of Tea production group	1) Interview transcript
			GI association /miller in Phonsavan	Ms Phimpone	1) Interview transcript
			Saeda (ONG)	M. ??? Programme officer	1) Interview transcript
			Lao Framer Products (big scale milk farm) BAN XIENGPHAN (???)	M. ??? Farm Manager	1) Interview transcript
		Conduct an interview to collect campaign information	FAFO	TABI project (Mr Somkhouan	1) Interview transcript 2) TABI 10 Year Report
				USAID Project? Mr Somphan	1) Record the interview

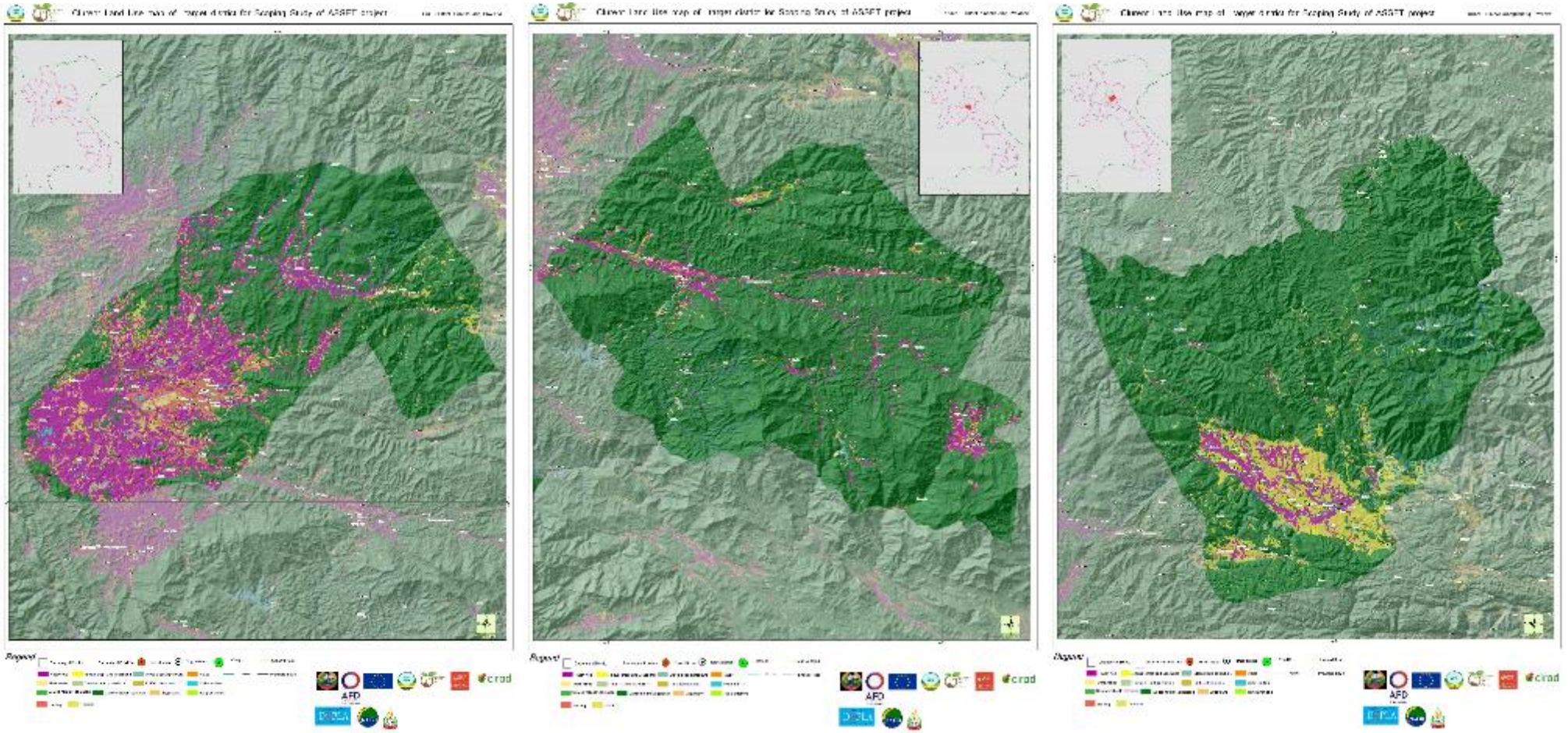
No	Date	Active items	Location	Participants	Data
					2) the documentation project (Project Document) (not document / data)
3	02/02/2021	Meet the Pek DAFO office Morning	DAFO-Pea district	Head of EPA office + the whole team	1) Interview transcript
		Interview group/Entrepreneurs	Organic vegetable production group BAN KANGVIENG	Head of EPA office + the whole team	1) Interview transcript
			Tea plantation for biodiversity conservation PHOUSAN BAN YODPHIENG	Head of EPA office + the whole team	1) Interview transcript
			Bee production for biodiversity conservation in BAN PONE	Head of EPA office + the whole team	1) Interview transcript
4	03/02/2021	Meet the PKM office Afternoon	DAFO-KOUN district	Deputy Head of the Office + the whole team	1) Interview transcript
					2) Report / plan / strategy (not yet documented / data available)
					3) Land use plan report (not yet documented / information)
		Travel to Ban KeoSed Afternoon Interview Coffee production group	Coffee Organic production group Ban KeoSed	Coffee production group Ban KeoSed	Travel 1) Interview transcript
			Coffee Purchasing Office.	Entrepreneur (M. Todd) buying KeoSed coffee Muang Xian Coffee company	1) Interview transcript

No	Date	Active items	Location	Participants	Data
		Afternoon	Ban Na Oua	Farmers Khao kai noi, membes of KMA-XKH GI association	1) Interview transcript
			Organic vegetable production group BAN TAM	Farmers and head of village	1) Interview transcript
5	04/02/2021	Travel to Kham District	Kham DAFO	The whole team	
		9:00-10:00	Khame DAFO	Deputy Head of the Office + the whole team	
		10:00-12:00	Organic Production Group Ban Kong	Kham Technical Officer + Villagers (Village Head)	Report / Plan / Strategy , Mr. Bounma
		1:30-4:00	Chinese-Lao company (sweet potatoes, peanuts, maize), contract farming	Chinese + Lao Entrepreneur	Interview transcript
			Peanut plantation using dropping water system	Team + Chinese Entrepreneur	Interview transcription

Annex 3. Topo maps of Pek, Khoune, and Kham districts



Annex 4. Land Use maps of Pek, Khoune, and Kham districts



Annex 5. Places visited in Pek, Khoune, and Kham districts during scoping study