



EVALUATION REPORT

Final evaluation of EFICAS project evaluation

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This evaluation has been financed by the European Union. The observations, assessments and recommendations expressed in this report are the sole responsibility of the authors.”

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Final Report Cover Sheet

Name of document	Final evaluation of EFICAS project
Acronym/PN	Reference: EuropeAid/132-657/L/ACT/LA Lao PDR Global Climate Change Alliance (GCCA) Programme
Country	Laos
Date of report	30 June 2018
Dates of project	December 2014 to March 2018
Evaluator(s)	Marion TREBOUX, Khosada VONGSANA
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Scope	Project
Type of report	Final Project Evaluation
Brief abstract (description of project)	<p>EFICAS project is a research-action project conducted jointly by DALAM, PAFO/DAFO and CIRAD in 8 intervention villages in Luang Prabang and Houaphan provinces.</p> <p>The project methodology combined land use planning, agricultural development and capacity building regarding participative innovation at community level. The project supported innovations at local level regarding livestock intensification and cropping system intensification.</p> <p>The monitoring and evaluation system provided information at community, households and plot level and make it possible to better evaluate complex changes such as vulnerability or land use change (last survey planned in late 2018, after EU funding end).</p> <p>EFICAS project set a process of participative capitalization with regular events gathering a wide range of stakeholders at provincial, national and regional level. EFICAS supported the Lao Upland Initiative with several events and a website gathering useful documentation. Several policy briefs were elaborated taking stock of lessons learnt of projects and institutions working on upland development.</p>
Program (higher-level) Goal (to which the project contributes)	EFICAS overall objective is to support eco-friendly and climate-resilient agriculture intensification through participatory development and extension of agro-ecological systems in Lao PDR.
Project Purpose / Goal/ Specific Objective	Develop and implement successfully in 8 pilot farming communities of Houaphan and Luang Prabang provinces an original intervention method that support an increased engagement of local farming communities into adaptive planning and implementation of more desirable development pathways.
ERs (more specific outputs/ outcomes)	<p>The tree expected results (outcomes) of EFICAS project are (according to the revised logical framework :</p> <p>R1. Village communities are engaged into the design and the implementation of low-carbon emission strategies at landscape level (WP2)</p> <p>R2. Local stakeholders (district implementers, local leaders and village community members) have increased capacity to (i) sustain the approach developed collectively, (ii) expand to other villages through participatory learning approaches and (iii) link with private sector to negotiate more balanced farming contracts (WP1)</p> <p>R3. Project results are disseminated to national level policy makers and up to regional networks (WP3)</p>
Evaluation Methodology	The evaluation determined the project's success in implementing activities and in attaining the project's goals and expected results. The evaluation included a review of relevant documents and participant interviews. Interviews were conducted with district government officials, project staff, and target community members to examine the impacts of the project. Interviewees provided their perceptions of the project's strengths, weaknesses, and impacts.
Summary of lessons learned (evaluation findings of	<ul style="list-style-type: none"> - Transition towards eco-friendly intensive and climate-friendly agriculture system is a medium term process (5-10 years). The EFICAS project started the process but support to communities has to be continued to reach a good balance between livestock intensification and cropping system intensification.

interest to other audiences)	<ul style="list-style-type: none"> - Participative land use planning and community-based agricultural development plan help to design what is the expected pathway of development. Simulation games are useful to help farmers to discuss about agricultural practices evolution. - Participative innovation takes time but contributes to communities capacity building (capacity to manage their own development, farmer to farmer exchanges) - AG
Contribution to MDG(s)?	1a: Income, 1b: Hunger, 7a: Environmental sustainability
Comments	<p>Actions implemented by EFICAS project have developed a relevant methodology to support transition towards eco-friendly and climate-resilient agriculture transition. First changes observed at community level are promising, especially regarding livestock intensification. Next steps are diversification and intensification of cropping system to reach a well-balanced agricultural system (better productivity, less vulnerability to climate and market hazard, sustainable soil management).</p> <p>Upscaling of EFICAS approach must be progressive (in accordance with PAFO/DAFO staff availability) and technical assistance is required for methodology support (PLUP/CADP elaboration, participative innovation facilitation, monitoring and evaluation).</p> <p>The link between EFICAS and NUPD (Northern Uplands Development Program) was quite relevant and effective. In addition to EFICAS action in Houaphan and Luang Prabang provinces, CIRAD and DALAM took advantage of AFD (French agency) funding to implement the same development approach (but in a different social and ecological context) in Phongsaly province. The choice of intervention villages was made considering NUPD priorities. EFICAS project participated to monthly coordination meetings of NUDP. EFICAS provided support for capitalization of experiences in strong collaboration with NUDP and contributed a lot to the LUI (Lao Uplands Initiative https://laouplandsforum.org) under NUDP. EFICAS also contributed to the elaboration and dissemination of methodological guidelines (for example regarding participatory agricultural land management and impacts assessment) useful for NUDP.</p>

Table of contents

TABLE OF CONTENTS	5
LIST OF ACRONYMS	6
1. PROJECT OVERVIEW	8
1.1. Remind on EFICAS objectives and expected results	10
1.2. EFICAS methodological approach	10
1.3. Remind on EFICAS project organisational structure	12
2. EVALUATION METHODOLOGY	13
3. RELEVANCE AND COHERENCE	15
4. EFFICIENCY AND EFFECTIVENESS	17
4.1. Result 1: the design and the implementation of low-carbon emission strategies at landscape level	17
4.1.1. Regarding lowland paddy production	18
4.1.2. Regarding livestock management	20
4.1.3. Regarding upland cropping systems	24
4.2. Result 2: capacity building of local stakeholders	27
4.3. Result 3: dissemination of results to national level policy makers and up to regional network	30
5. IMPACTS	33
6. SUSTAINABILITY	36
7. CONCLUSIONS AND RECOMMENDATIONS	39
8. SUGGESTIONS FOR UP-SCALING	42
ANNEX A : TOR FINAL EVALUATION EFICAS PROJECT	48
ANNEX B: LIST OF INTERVIEWS AND PARTICIPANTS	55

List of acronyms

AFD	Agence Française de Développement (French Agency for Development)
AIDA	Agroecology and Sustainable Intensification of Annual-based cropping system (CIRAD Research Unit)
ALCDC	Agricultural Land Conservation and Development Centre (under DALaM)
ALiSEA	Agroecology Learning Alliance in South East Asia
CA	Conservation Agriculture
CADP	Community-based Agricultural Development Plan
CANSEA	Conservation Agriculture Network in South East Asia
CIRAD	Centre de Cooperation International en Recherche Agronomique pour le Développement
DAFO	District Agriculture and Forestry Office
DALaM	Department of Agricultural Land Management (under MAF)
DoNRE	Department of Natural Resources and Environment
EDT	Experiment-Demonstration-Training
EFICAS	Eco-Friendly Intensification and Climate resilient Agricultural Systems
EU	European Union
FFS	Farmers' Field Schools
FPIC	Free, Prior, and Informed Consent
GCCA	Global Climate Change Action
GIS	Geographical Information Systems
HH	Household
LICA	Lao Initiative on Conservation agriculture and Agroecology (ASEAN level)
LUI	Lao Upland Initiative
LULCC	Land Use Land Cover Change
MAF	Ministry of Agriculture and Forestry
MoNRE	Ministry of Natural Resources and Environment
NAFRI	National Agriculture and Forestry Research Institute
NPCO	National Project Coordination Office (NUDP)
NUDP	Northern Uplands Development Programme
NTFP	Non Timber Forest Product
PAFO	Provincial Agriculture and Forestry Office
PALAM	Provincial Department of Agricultural Land Management (under PAFO)
PLUP	Participatory Land Use Planning

R-D	Research-Development
SARI	Small Agricultural Rural Infrastructure (NUDP component)
SFSA	Sayabouri Fund for Sustainable Agriculture
TSC	Technical Service Centre
VLMC	Village Land Management Committee
WP	Work Package

1. Project overview

The *Landscape management and conservation agriculture development for eco-friendly intensification and climate resilient agricultural system* (EFICAS) project has been implemented by CIRAD, DALAM and MAF. The project is funded by the European Union (EU) and CIRAD. EFICAS is designed to mainstream climate change into GoL's poverty eradication efforts by promoting sustainable natural resources management and improved land management. EFICAS began operations in March 2014 and completed field activities in March 2018. The AFD has funded an extension phase of 16 months (one additional agricultural season).

The project is part of the Global Climate Change Alliance Programme.

Table 1 :Reminder on Global Climate Change Alliance Programme

<p>Overall objective Mainstream climate change into GoL's poverty eradication efforts by promoting sustainable natural resources management and improved land management</p> <p>Specific objectives <ol style="list-style-type: none"> 1. To strengthen the climate change related institutional, policy and regulatory framework; 2. To pilot sustainable and climate resilient land use approaches and adapted farming systems at local level to inform policy making and improve communities' livelihoods and resilience to climate change. </p> <p>Expected results R1. Local, provincial and national institutions and capacities are strengthened with regards to designing and implementing development plans addressing climate change; R2. Grassroots pilot activities enable improved agricultural practices, sustained natural resources management and environment-sensitive livelihoods in selected areas and contribute to resilience to climate change; R3. Lessons drawn on climate change from grassroots activities influence policy making and are communicated to relevant decision-makers in the relevant sectors.</p>

Project activities were conducted in 8 upland communities in Luang Prabang and Houaphan provinces targeting 416 households. The number of villages is limited in comparison with conventional rural development project as EFICAS had a strong focus on research, information production and knowledge sharing.

Province	District	Village	Nb HHs
Luang Prabang	Pakseng	Hadsam	74
		Houayvat	44
	Viengkham	Phoutong	73
		Samsoom	26
Houaphan	Houamouang	Naphieng	60
		Houaymoun	68
	Viengxay	Vangseng	35
		Phoungkang	36
		TOTAL HHs	416

The main target groups were:

- **Rural communities** (individual farmers, farmers groups, villages 'authorities)

- **Government authorities** at kumban (group of villages), district and provincial levels to support the action and to draw lessons for scaling up results
- **Private sector** to ensure inputs supply, link production to markets and develop fair contract farming models between farmers and traders.

Target villagers belong to a **diverse array of ethnic groups**, including Khamu, Hmong and Kheu. Several villages have been resettled in the early 2000, which implies bigger distance between houses and fields. Swidden agriculture has traditionally been the basis of subsistence farming system in the uplands of northern Laos. This rotational system allowed to control weed pressure and to restore fertility with long fallow periods, more than 10 years. Through this system upland dwellers could sustainably ensure their subsistence based on sloping land cultivation.

All communities engage in upland subsistence farming characterized by the cultivation of rain-fed upland rice, vegetables grown on upland, free-range grazing of livestock and also hunting and gathering in forest areas. Some families farm paddy rice where lowland is available. Villages typically experience high levels of poverty, low level of education and limited access to basic services (water adduction, access to primary school and health services).

Their production context has changed over the years with their rapid integration to market that increased their dependence to external factors (prices of products, contracts with traders, economic regulations). New crops were introduced, such as hybrid maize, and entire villages turned to new cropping systems with shortening fallow periods. These new practices disrupted nutrient balance in the swidden system and led to **gradual land degradation**.

With market opening, upland households also got access to new opportunity to develop their livelihood by switching from subsistence activities to income generating activities such as trade, service provision, etc. **New livelihood strategies emerged** such as capital accumulation through livestock, investment in perennial crops, diversification of income generating activities, depending on the household asset available in terms of labour, land and capital and the objectives of the farmers.

Schematically the EFICAS documentation highlights three categories of household strategies:

- The **hanging in** strategy consists in **maintaining traditional practices in the absence of individual capacity to change**. In Laos, many households still practice upland rice cultivation for self-consumption despite the government policy to eradicate this cropping system. **This Survival strategy does not allow to accumulate capital and cannot lift these households out of poverty**.
- **Stepping up strategies** require to mobilize capital for investment in cash crops or livestock, allowing households to gradually accumulate capital. New income generating activities remain in the sphere of agriculture.
- **Stepping out strategies** mark a diversification of income generating activities outside of the agricultural sphere. The capital accumulated through cash crop cultivation and animal husbandry is reinvested in off-farm activities (e.g. small trade, transportation after purchasing a truck, service provision but also education of children).

Household capacity to seize opportunities depends on the labour-force, the capital and the land available at household level but also on external factors such as village accessibility, village topography, and social context.

EFICAS project took place in this context of agrarian transition and diversity of households strategies to improve their livelihoods.

1.1. Remind on EFICAS objectives and expected results

The logical framework of has been revised in 2016 after the ROM evaluation.

Overall objective

Support eco-friendly and climate-resilient agriculture intensification through participatory development and extension of agro-ecological systems in Lao PDR

Specific objectives

Develop and implement successfully in 8 pilot farming communities of Houaphan and Luang Prabang provinces an original intervention method that support an increased engagement of local farming communities into adaptive planning and implementation of more desirable development pathways.

Expected results

R1. Village communities are engaged into the **design and the implementation of low-carbon emission strategies at landscape level (WP2)**

R2. Local stakeholders (district implementers, local leaders and village community members) have **increased capacity** to (i) sustain the approach developed collectively, (ii) expand to other villages through participatory learning approaches and (iii) link with private sector to negotiate more balanced farming contracts (WP1)

R3. Project **results are disseminated** to national level policy makers and up to regional networks (WP3)

1.2. EFICAS methodological approach

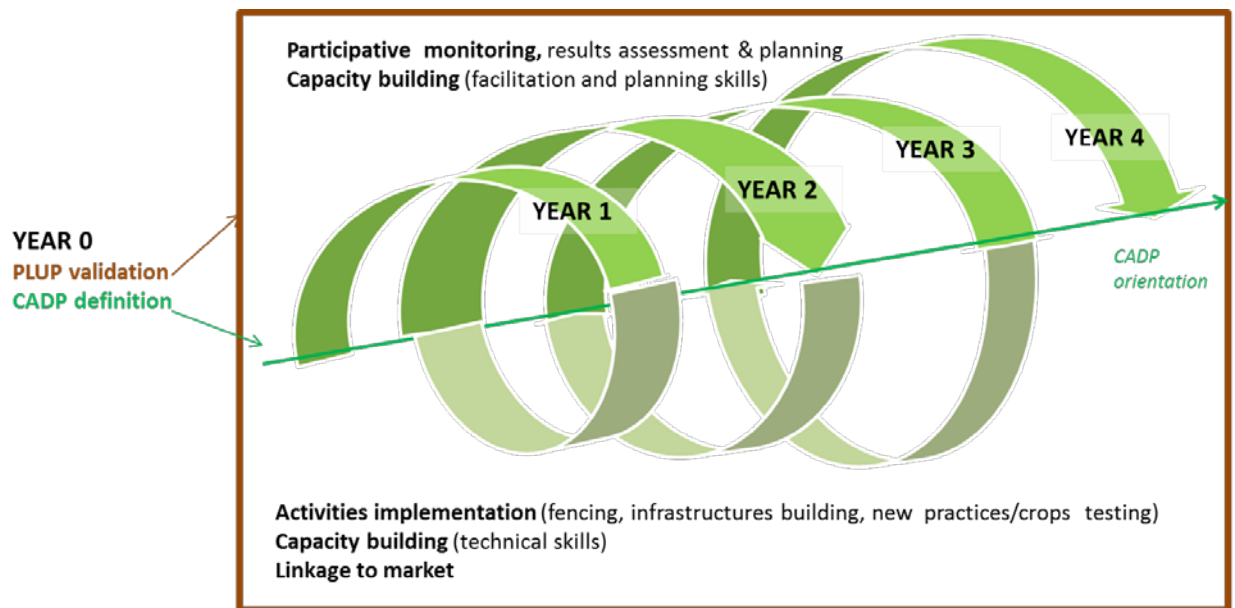
Agro-ecological practices are considered relevant to better cope with climate change and to reduce carbon footprint of agriculture. Agro-ecological practices are also considered as an option to sustainably intensify production systems and avoid agriculture expansion in forest areas (the land use change from forest to pasture or crops area is an important source of carbon emissions).

CIRAD and DALAM have collaborated since the early 2000 to test and develop agro-ecological practices in Lao, especially mulch-based cropping systems with no or limited tillage that limit erosion and restore soil fertility in slopping areas. In spite of good results at plot scale, **the level of adoption of these agro-ecological practices appeared to be very low**. Based on this experience, CIRAD and DALAM have developed a more comprehensive approach of innovation with the following principles:

- Articulate land use planning at community level and introduce several technics to intensify production systems (both livestock and crops)
- Foster participation and ownership of planning and innovation process by communities
- Facilitate the linkage to the market to foster diversification of cash crops

The EFICAS project had also a strong focus on monitoring and evaluation of impacts in order to be able to better understand complex changes in livelihoods, ecosystems and adaptation to climate change.

The EFICAS approach is iterative (see figure below) with a gradual increase of activities implemented.



The first phase is dedicated to Participatory Land Use planning (PLUP) revision and validation with the whole community. This PLUP revision enables to define which area is dedicated to which use. This PLUP is fundamental: it structures the organization of the territory (lowlands for paddy fields, upland areas dedicated to crops production, areas dedicated to fruit-trees production, area dedicated to livestock raising, area of conservation forest...) and **lays the foundation for coherent and sustainable territory development.**

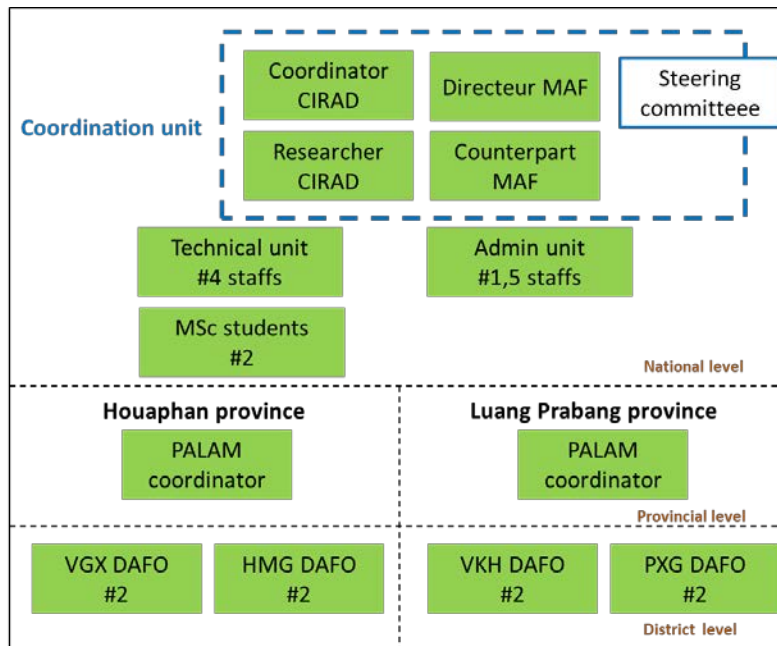
In this first phase, the second step is to define a community-based agricultural development plan (CADP). This participatory planning is based on problems analysis of each area defined in PLUP (lowlands for paddy fields, upland areas dedicated to crops production, areas dedicated to fruit-trees production, area dedicated to livestock raising, etc.) and different activities. This plan sets **medium term objectives** regarding desirable evolution of farming systems for the community.

The second phase is the implementation of activities in the field. Priority activities defined in CADP are implemented by the villagers with the technical and financial support of the project. Villagers define their needs before the agricultural season, receive inputs and trainings and implement activities in the field with EFICAS regular support (throughout DAFO). At the end of the agricultural season, a **participative assessment of activities and results** is made and contributes to **adapt the CADP implementation** for the following year.

1.3. Remind on EFICAS project organisational structure

EFICAS project is the result of a **long-term partnership between CIRAD and MAF/DALAM**. The organisational structure reflected this collaboration. Activities in the field were conducted by DAFO staff (one DAFO staff per target village). The coordination unit at national level and at provincial level provided technical support (methodological approach, monitoring and evaluation), organized the capitalization of experience and dissemination of experience and facilitated the relation with provincial and district authorities.

The project organisational structure is presented in the figure below :



2. Evaluation methodology

The agenda of the mission and list of people met is available in annex B.

Desk review

A desk review was conducted prior to beginning the field research. Documents reviewed included: project document (proposal), final report, initial and revised logical framework, Results Oriented Monitoring Report, Community-based Agricultural Development Plan for each village, Lau Upland Initiative and EFICAS website.

Briefing in Vientiane

A first briefing was held in Vientiane with project staff (CIRAD staff and DALAM staff including regional DALAM coordinators); NUDP and AFD representatives.

A second meeting was held with EU delegation representative.

Interview procedure

The primary instrument for the evaluation was individual and small group semi-structured interviews. Interviews were conducted to assess the project's impact from the perspectives of different stakeholders.

- Project staff
- Institutional stakeholders interviews at province and district level : PAFO/PALAM/DALAM
- Communities

Considering the limited number of villages targeted by EFICAS project, almost all of them were visited during the mission.

LUANG PRABANG PROVINCE	HOUAPHAN PROVINCE
Hatsam (<i>Pakseng district</i>)	Nam Tip (<i>Houamuang distric</i>)
Houayvat (<i>Pakseng district</i>)	Houaymoun (<i>Houamuang district</i>)
Phoutong (<i>Viengkham district</i>)	Vangseng (<i>Viengxai district</i>)
Samsoum (<i>Viengkham district</i>)	

At community level, the evaluation team met with land management committee members and other villagers when available. In Houyavat village, the evaluation team had the opportunity to organize a specific focus group with women.

In each village, the evaluation team did a field visit to discuss about EFICAS realization according to activities conducted under the CADP (paddy rice fields, upland fields, fodder plots and improved pastures, cardamom plantation, vegetables garden, fruit-trees plantations, etc.) . This field visit enabled discussion with villagers directly in their fields.

In addition the evaluation team visited the DAFO technical center in Viengkham district (technical center supported by EFICAS project mainly to provide seeds and seedlings)

Evaluation team

The final project evaluation was led by an independent international consultant and a national consultant.

Limits

- Cropping season : few households available (most of them working in the fields)
- Difficulty to meet households who not have taken part to EFICAS activities (working in their fields, not available)
- Limited time in each village to assess a wide range of activities (not all the activities assessed in all the visited villages) : focus on activities related on priorities identified in CADP
- Rainy season : few fields difficult to access (especially fodder plots)

3. Relevance and coherence

Regarding the Global Climate Change Alliance Programme

The EFICAS approach project combined **activities on the field in 8 target villages** (and 8 control villages), integrated approach of **capacity building at provincial, district and local level** (targeting different stakeholders) and an **overall system of monitoring and evaluation** that provided information and data on results and impacts. Grassroots pilot activities results and lessons learnt were shared in many different ways to reach a variety of stakeholders and decision-makers (multi-stakeholders platform with institutions involved in uplands development: Lao uplands initiative (<https://laouplandsforum.org/>), fields visits with official from MAF, website, different kind of event including an high-level conference in March 2018, contribution to the sector working group on agriculture at national level).

EFICAS project is not a typical community-based development project but **knowledge production oriented**. The balance between activities at local level, capacity building and capitalization of experience seems adapted to innovation management. The number of direct target villages is limited in this first stage but has already increased since 2018 (with AFD funding). It is also noticeable that counterpart institutions, i.e. DALAM at national level and PAFO and DAFO at local level, were involved in the whole set of activities. This collaboration is fully part of the learning-by-doing process and is relevant to insure a better ownership of the lessons learnt from the experience.

At communities level

The **EFICAS approach** was focused on problem analysis by villagers and then progressive implementation of activities with regular monitoring and technical support. Several communities stressed that regular presence of EFICAS staff in support of villagers throughout the activities (in comparison with other projects that just deliver inputs and then never come back) has contributed to trust-building, to foster ownership and to adapt activities implementation to communities' capacities (to respect their pace in innovation process).

At **strategic level**, the principle to **define livestock raising areas in the PLUP and to offer options to intensify livestock production systems is a key-point**. All the main constraints to livestock production and risks have been considered and solutions discussed **at community level**: land use planning, feed improvement (fodder, mineral salts), animal health (vaccination, health practices), stalls and access to water for livestock watering. This **holistic approach of livestock intensification** is essential to make the livestock production both more productive and resilient. Even if the livestock production system is intensified in comparison with the existing system, it remains an "extensive" low-carbon model. The livestock is raised at family-level and small scale, the zoning for livestock grazing lands is clearly defined (no extension in other forest areas). As it is a grazing-based production system, the external inputs are very limited (only salt and vaccines).

The focus on livestock is relevant in many aspects. First, the livestock is an additional source of income and a kind of saving, which is mobilised by the farmers in case of need (for health and education services) and thus contribute to increase the resilience of the communities. It is also a

capital that can be used to invest in new activities (agricultural activities but also small off-farm businesses) or to recover after a crisis. Secondly, in existing farming systems the livestock is grazing freely in the crop fields after the harvest. Farming-system sustainable intensification implies crop diversification and adoption of alternative practices to manage soil fertility (such as leguminous in the crop rotation, green manures, agroforestry, composting, etc.). This practice is **a major obstacle to the diversification of crop and the adoption of new practices** to manage soil fertility (such as legumes in the crop rotation, green manures, agroforestry, composting, etc.), because the livestock damages the crop but also the vegetable cover in direct seeding mulch-based cropping, destroy the tree-fruit seedlings and young trees, damages the vegetables gardens during the dry season. The livestock intensification by fencing the pasture area is also a solution to free-roaming livestock (at least during the agricultural season) and **set the conditions for the intensification of cropping systems**.

Regarding the intensification of cropping systems, the EFICAS project offered a **wide range of technical packages (no standard package)** in accordance with communities' different contexts. In addition to technical support in production, the EFICAS project also considered **market opportunities and connections with the private sector**. Secure a commercial outlet is a key-point for diversification of farming-systems.

At institutional level

At provincial and district level, EFICAS project partly complies **with district strategies regarding agriculture development and forest conservation**. For example in Luang Prabang province and in Houamouang district in Houaphan province, the livestock production is expected to be developed. In Viengxay district in Houaphan, there is a policy aiming to develop pesticide-free fruits production. Nevertheless the PAFO/DAFO strategies are "mono-product" based with a **star product per province or district**. This "mono-product" strategy is easy to catch for DAFO staff but is inconsistent with resilience and risk management at community level. The more integrated EFICAS enables to develop diversified systems that include the star products promoted by local authorities.

Regarding **land use issues**, there is a good articulation between Northern Uplands Development Programme (NUDP) component on land use planning and EFICAS. EFICAS and NUDP have worked jointly on PLUP elaboration process. The community-based agricultural development plan is also a way to go further than PLUP document and identify what are the concrete development options: how the area allocated to each purpose could be better valued, what are the priority actions to be implemented? **The PLUP/CADP sequence is quite relevant**: the PLUP is more acceptable and is more than an administrative document thanks to CADP, the CADP is consistent with collective decision on land use planning and forest resource management.

4. Efficiency and effectiveness

4.1. Result 1: the design and the implementation of low-carbon emission strategies at landscape level

The indicators of the result 1 (revised logframe after ROM 2016) are the following:

R1: Village communities are engaged into the design and the implementation of low-carbon emission strategies at landscape level (WP2)
[Lowland paddy production] <i>Lowland paddy area</i> : increased by 10% (when feasible and relevant) <i>Lowland paddy productivity</i> : increased by 10%
[Livestock management] <i>Number of production areas that are permanently fenced</i> : at least 2 production areas (agricultural or livestock areas) per target permanently fenced after 3 cropping seasons <i>Number of villagers leaving their livestock roaming freely after main crops harvest (rice, maize)</i> : Decreased by 50% <i>Percentage of livestock owners involved in improved livestock management (e.g. feeding systems, animal health, better housing)</i> : Increased by 50%
[Upland cropping systems] <i>Total number of cultivated species/cultivars</i> : Increased by 10% <i>Percentage of farmers implementing intercropping/ relay cropping systems with legume crops</i> : Increased by 20%
[Low-carbon emission at landscape level] <i>Ratio upland crop area to forest area</i> : Decreased by 10%

The first result regarding the design and the implementation of low-carbon emission strategies at landscape level is the **definition for each target village of a community-based agricultural plan in line with PLUP** (including PLUP up-dating when relevant). This document constitutes the foundation of the process. Both PLUP and CADP are available at Village Land Management Committee (VLMC) level. PLUP and CADP key-information has been reworked graphically and printed in poster visible in each village meeting-room.

Regarding the orientations defined in CADP, the villagers emphasized the good coordination for activities implementation. The chosen option was **participative innovation with farmers**. Many different “technical packages” have been proposed by EFICAS project in accordance with each village context (altitude, existing production, access to market...). Villagers have tested many different things (some abandoned, some adopted at small scale and some adopted and disseminated). **Engage the community in testing process** is already a good result irrespective the level of adoption of these “technical packages”.

The process of participative testing was organized in a very classic manner. Before the agricultural season, EFICAS propositions (activities and terms and conditions for each activity) were presented during a village assembly. Each villager was free to join a group for a given activity (for example improved pasture, SRI testing, cardamom planting, ...). EFICAS project provided technical support, inputs (seeds, seedlings, barbed wire, etc.). Participative monitoring and evaluation enabled to assess results after the agricultural season, discuss opportunities and difficulties and adapt the

next year activities planning. The VLMC met during the evaluation process stressed (in comparison with other projects working in the same village) the good coordination of EFICAS activities (specifically the good accordance with agricultural planning, not late planning or delivery of inputs) and the regular presence of EFICAS staff in the field.

4.1.1. Regarding lowland paddy production

Only the target villages in Houaphan province have suitable lowland for paddy production. The paddy production improvement is known as a key-point for farmers' resilience. Other experiences in Northern uplands in Lao have demonstrated that the access to new paddy areas and/or the sustainable improvement of paddy fields productivity improve the food security of communities (less exposure to climatic hazards, potential development of cash-crops during the dry season).

EFICAS have worked in different ways in accordance with problem census in each village.

District	Houamuang		Viengxai	
Village	Houyamoun	Nam Tip	Phoukang	Vangseng
Irrigation infrastructures/ access to water	Road toward paddy fields 1,5 ha of paddy built (1HH) 3 motor pump to facilitate access to water	Anti-flood infrastructure (gabions)	Road to paddy fields	Support to water retention building
SRI	-	3 HH	-	6 HH
Compost	-	-	Tested but used in fruits-trees plantation, not in paddy fields	-
Promotion of dry-season diversification in paddy-fields	-	15 HH (vegetables)	12 HH (vegetables)	

Support to infrastructures

EFICAS support to irrigation infrastructures is quite limited because structural infrastructures (such as irrigation scheme, paddy terraces) require specific technical feasibility studies and important investments. Nevertheless EFICAS project tried to **meet villagers demand for small infrastructures construction**.

In Houyamoun village EFICAS project supported **paddy bank reinforcement to limit the flooding** of paddy rice. The quality of some of these infrastructures is questionable (insufficient height to completely protect paddy fields from the river flood during the rainy season, gabion baskets not correctly filled with stones and already in bad conditions).

In the same village, EFICAS subsidized the purchase of motor-pump for three groups of farmers in order to facilitate paddy irrigation in water shortage periods (especially in the early season when water stream is still weak). The use of motor-pump is costly due to gasoline and paddy production

is profitable only if motor-pump is used occasionally. The relevance of such equipment is questionable.



Figure 1 : Paddy bank reinforcement with gabion

In Vangseng EFICAS supported the building of a small water retention installation and subsidized the purchase of irrigation pipes. Once again the quality of these infrastructures is questionable. Villagers question the matching between the water retention capacity, the pipe diameter and the area of fields to be irrigated.

EFICAS project did not focus its action on irrigation infrastructures (less than 10% of CADP budget dedicated to lowland intensification). **The few achievements are of varying quality and underline the need of specific engineering at conception stage and technical support for building.** Consequently it seems **highly appropriate to connect with projects specifically focused on irrigation** (including Small Agricultural Rural Infrastructure / NUDP component) to develop infrastructures.

Promotion of alternative cultivation techniques

EFICAS supported SRI (sustainable rice intensification) practice dissemination, compost and varietal improvement to increase paddy productivity.

Sustainable rice intensification was tested in 2 villages by 16 households. At this stage, **the SRI remains at testing level.** The households who have tested it said that there is no clear yield increase even if the rice grains are bigger. Furthermore this practise is perceived by farmers as more labour-intensive than the conventional one. Nevertheless as they have tested SRI only during one or two agricultural season, they seem interested to try it again.

Farmers were trained to compost fabrication but so far **the compost fabrication seems quite limited and not used in paddy production.** Even if the compost production could increase with the livestock production increase (easier to collect manure), it is unlikely that farmers will use it on paddy fields (priority to vegetables gardening and fruit-trees).

Regarding the varietal improvement of rice, different varieties have been tested in 4 villages, some of them with an increase of rice yields compared to traditional varieties. The **dissemination of these varieties remains quite low** but most of the households that have tested varieties conserve

seeds for next agricultural season (so make it possible a wider dissemination within the next years).

Promotion of dry-season diversification in paddy-fields

The evaluation team did not have the possibility to evaluate this activity (few households involved in only two villages).

Conclusions regarding lowland paddy production

Data regarding lowland paddy production are not available. Even if several results were achieved regarding irrigation infrastructures and better access to water, the effects on paddy production seem quite uncertain (low sustainability of infrastructures and equipment). It confirms that irrigation infrastructures building/rehabilitation should be delegated to projects specialized on irrigation development.

Regarding promotion of alternative practices, **the added-value of SRI practice is not really clear at this stage**. Further experiment on-farm is needed and it. So far SRI has not contributed to paddy production increase in target villages.

Regarding compost fabrication and use, many farmers have been trained. This practice could be facilitated by livestock increase and stalling (manure available and easy to collect around stalls to make a good quality compost). As compost fabrication is labour-intensive, compost **is used in priority for cash-crops with higher added-value (and also more sensitive to organic fertilization) such as vegetables and fruit-trees**. So far it cannot be expected an increase of paddy production due to compost use at this stage.

Regarding the **promotion of dry-season diversification in paddy-fields, conditions are not met at this stage but EFICAS actions regarding cattle roaming management must contribute to make it possible in the coming years**. The conditions of dry-season diversification in paddy fields are 1) to have a permanent fencing between paddy area and livestock raising area, 2) to have enough food resources for livestock during the dry season out of the paddy area and 3) to have a collective decision of the farmers regarding livestock management rules (where and when animals are allowed to be in paddy fields). There is a clear link between of the livestock production system and dry-season diversification in paddy area. The livestock intensification model promoted by EFICAS makes the dry-season diversification possible in the medium term (when enough fodder is available out of lowlands during the dry season) and it can be expected that this practice will increase in villages where free-roaming animals issue is collectively managed.

4.1.2. Regarding livestock management

The livestock management is a key-activity in EFICAS project and activities were conducted in all target villages.

The actions conducted in all villages were:

- Support to permanent fencing (barbed wire or living fence) to separate livestock area and crop production area (700 ha permanently fenced).

- Support to the definition of collective rules regarding animal roaming
- Support to forage plots establishment to improve livestock feeding (170 ha of improved pasture)
- Support to animal housing (180 stalls) and water access (7 water adduction systems)
- Support to animal health (3 veterinary workers per village, collective training on animal health) and specific focus on vaccination

Permanent fencing

Achievements regarding livestock management are visible in every target village. Most of the time, villagers have decided to fence the collective area of livestock production in accordance with the PLUP (this area is variable from a village to another). The **permanent fencing is mainly made with barbed wire**; living fences with shrubs like *Jatropha curcas* are less frequent.



Figure 2 : fenced collective pasture (Houaphan province)



Figure 3 : fenced collective pasture (Luang Prabang province)

Collective rules regarding animal roaming

The definition of collective rules regarding animal roaming was discussed in every village. These rules are about livestock management: when and where livestock is allowed to graze. These rules are important to reduce damages to crops by free-roaming livestock. The **level of implementation of these rules is linked to the collective cohesion**. The more households are involved in pasture fencing and “livestock group”, better is the coordination regarding free-roaming animals. A present constraint is the matching between fodder resources available in the livestock area (especially during the dry-season) and the number of animals to feed. Paddy area provides grass during the dry season when other fodder resources are missing. As fodder plots are still being implemented, older fodder plots are set aside to produce fodder seeds and increase fodder area in the next years. The respect of rules regarding animal roaming is an **ongoing process**. At this stage most of the farmers say that there is **no longer animal free-roaming during the rice season cultivation** (May to November/ December).

Forage plots establishment in livestock area

Forage plots establishment is a key-activity of EFICAS project. From a village to another, the options are different. In Houaphan province, most of the plots are collective. In Luang Prabang province the initial fodder plots were collective but the present trend is to cultivate individual

fodder plots. **The area of fodder plots is increasing year after year, farmers continue to establish or increase fodder plots beyond EFICAS project support.** Several varieties of fodder have been provided by EFICAS project but the most common is ruzi grass (for grazing) and on a lesser extend nepia grass (to cut and carry grass in stalls). These varieties are well disseminated by farmers themselves.



Figure 4 : collective pasture with ruzi grass



Figure 5 : farmers planting a fodder plot with nepia grass cuttings



Figure 6 : Nepia grass ready to be cut



Figure 7 : cattle fattening with nepia grass (cattle is purchased then fattened during few months and sold)



Watering and housing for livestock

Small water supply systems (tank, pipes and troughs) for livestock watering are collective and make it possible to let livestock in pastures. Regarding animal housing, most of the initial stalls were collective. At present the trend is that each farmer builds stalls for its own herd (especially for fattening activity). **Water supply systems and stalls contribute to make the livestock production more resilient** (better access to water during the dry season, protection of animals during the winter). The better distribution of water resource in space makes it possible to value bigger areas of pasture with less labour-force (no need to carry water and to displace herds regularly to reach water stream or sources. Furthermore it increases hygiene level (less contamination of water by faeces, less contact with herds from neighbouring villages).



Figure 8 : water tank to supply water for livestock and for vegetables garden downstream



Figure 9 : trough in collective pasture



Figure 10 : stall for goats in collective pasture

Animal health

Animal health improvement is also a key-action to improve livestock production resilience. In the traditional livestock raising system, there is very little concern regarding animal health. EFICAS provided training on animal health for the whole community and supported the implementation of 3 veterinary workers per village. These veterinary workers are in charge of animal health monitoring (detection of sick animals) and they provide service of preventive health, especially vaccination. In addition EFICAS has provided a fridge and a revolving fund in each village in order to have an easier access to vaccines. **The level of vaccination has increased a lot (especially for buffaloes, cattle and goats with vaccination rate higher than 80%):** in several villages, regular

vaccination is set as a condition to access to collective pasture area. Because of power cuts in villages, vaccines stock has been lost in several villages but the supply of vaccines by DAFO seems good enough to organize vaccination sessions at the good time.

Conclusions regarding livestock management improvement

The achievements on livestock production are the most visible in intervention villages and raise the enthusiasm of many farmers. The context is favourable as the market demand for any kind of meat is quite high (for both Lao and foreign markets). Permanent fencing has defined areas for livestock production and fodder is perceived as an important innovation by communities. Fodder plots are still quite recent, many of them are used to provide seeds and grass cuttings to extend fodder areas. At this stage fodder management (such as weed control, fences maintenance, or management of livestock density) are a secondary concern for farmers. These first actions contributed to **set groups of livestock owners and to highlight the importance of collective dynamic for livestock management for example for animal health.** There is an immediate gain in livestock productivity as soon as basic practices such as fencing of pasture area and vaccination are adopted but the livestock intensification is still at a very early stage (at this stage there is no specific strategy fodder resource management, the storage of fodder for the dry-season is not practiced, animal health care is very basic, etc.). Nevertheless villagers seem interested by cattle fattening (young cattle purchased and fattened in stalls during few months) that is a kind of specialization in livestock production. Few “pioneer” farmers have started this activity after a study tour in Xieng Khouang province. This new activity (that is individual and more labour-intensive) is seen a good business opportunity but is going to stress attention on management of collective fodder plots (what would be the regulation of fodder use in collective plots for villagers that will cut fodder for cattle fattening).

4.1.3. Regarding upland cropping systems

The traditional upland cropping system is a shifting system with slash and burn practice and long natural fallow periods (more than 10 years) to recover soil fertility before cultivating again. There is a specific issue on soil fertility management as cropping areas have been extended (by communities themselves but also throughout large concessions to private companies) and consequently fallow period has decreased. Main challenges in upland cropping systems are to diversify production in order to increase the resilience to climate and market evolutions and to introduce practices that contribute to soil fertility management and therefore to better yields (for example the rotation with legumes in the cropping system). EFICAS have worked in different ways in accordance with problem census in each village.

Legumes promotion, varietal improvement

EFICAS promoted **the integration of more legume crops in upland systems**, especially soybean, groundnuts, rice bean and pigeon pea (shrub that contributes to fallow improvement and on which sticklac can be inoculated). EFICAS provided technical support and supplied seeds (with a range of varieties to be tested). Cooking courses were also organized in each village to show how to process soybean in vegetal milk, cake or tofu.

In 2017 around 140 ha of legumes were cultivated with EFICAS support. The level of integration of legumes in cropping system remains limited (marginal surface regarding other crops). The main constraints identified to legumes cropping are the productivity of available varieties in uplands context (especially for soybean), the labour availability, and **low market demand at this stage** (varying from one village to another). Nevertheless, most of the families continue to grow legumes in order to maintain seeds stock and be ready in case of market opportunity. In 2017 amongst 425 households of the 8 intervention villages, 140 households cultivated soybean and 120 households cultivated groundnut (but mostly small plots). According to women, the consumption of soybean at community level has increased and where market is available (near the Vietnamese border), few women have started a small business with homemade tofu.

Stick lac and pigeon pea production were already practiced in few villages. EFICAS supplied seeds and inoculum and provided technical support to increase productivity. Even if the farmers are satisfied with this production, the extension of stick lac (as “cash crop”) and pigeon pea (for fallow improvement) remains quite limited. **Most of the farmers wait for market opportunity for sticklac** before starting or expanding their production.



Figure 11 : Stick lac production stored (producers waiting for buyers)

Cardamom and fruits trees

Cardamom is a new cash crop in Houaphan and Luang Prabang provinces. EFICAS project organized study tour in Phongsaly province where cardamom value chain is well developed, provided seedlings and technical support. The cardamom has the specificity to grow under riparian forest cover so **cardamom cultivation fosters riparian forest conservation**. 54 families from 6 villages have implemented small plantations of cardamom. The survival rates are good (more than 80%) but these plantations are not productive yet; first harvests are expected in 2020. Market demand is already present in villages (middlemen ready to buy cardamom production). If first harvests are satisfactory for farmers, they will very likely extend their plantations.

Another option of diversification supported by EFICAS is fruit trees production. EFICAS has provided fruits trees seedlings for schools but most of the young trees died after the exceptionally cold winter in 2016. In a more market perspective, EFICAS supported the establishment of orchards (mainly orange-trees and plum-trees but also banana-trees). Farmers choose species and varieties. Most of the orchards are with the same variety of orange-trees identified as the **most profitable regarding present market opportunities**. First harvest is expected around 6 years after fruit-trees plantation. EFICAS has provided technical support regarding orchards management in this implementation phase (fertilization by compost, intercropping with legume to control weeds between young trees).



Figure 12 : orange-trees plantation partly associated to groundnut (right part of the plantation)



Figure 14 : nursery built with EFICAS support to produce fruit-trees seedlings



Figure 13 : banana (local variety) plantation

Vegetable gardens

In several villages EFICAS has supported the development of **vegetable gardens** (protected by permanent fencing) taking advantage of the water supply system built for livestock watering. Greenhouses for vegetable gardening during the rainy season (when vegetables supply is low) were also built. EFICAS has supplied vegetable seeds and organized training on compost fabrication and use. These vegetable gardens are quite recent (few months of production during the last dry season, first production season starting in greenhouses). At this stage vegetable gardens are collective but split in small plots, each family cultivating its own plot. **Most of the present production is for family consumption**, few families plan to develop vegetable gardening

as source of incomes for the next dry season. As the activity just started, the fertilization issue is not identified by farmers and the fabrication and use of compost is quite limited. Nevertheless in Phoutong village farmers have started to collect manure from goats' stalls to put in the close collective vegetable garden.

In addition to support to vegetable gardening, EFICAS project supported the building of a



Figure 15 : collective greenhouse for vegetable gardening during the rainy season



Figure 16 : collective fenced vegetable garden (in the background some families planted maize as vegetables production is difficult during the rainy season)

Conclusions regarding upland cropping systems

The changes in upland cropping systems are quite slow. Communities have spent a lot of energy and investments on livestock activity. The diversification is a long-term process and many farmers want to observe if “pioneers” of the village are successful (or not) before embarking on a new production. Furthermore the identification of markets opportunities is decisive to start or develop a new production.

At this stage legumes and vegetables are grown at small scale and mainly for self-consumption and contribute to improve food balance and quality for families. Regarding legumes, the local market is limited. Demand of neighboring countries seems high but there is a **lack of connection between farmers and buyers**. The investment on cardamom and fruit-trees is too recent to get a return but these plantations are good assets for the future if there is no market saturation.

4.2. Result 2: capacity building of local stakeholders

The indicators of the result 2 (revised logframe after ROM 2016) are the following:

R2. Local stakeholders (district implementers, local leaders and village community members) have increased capacity to (i) sustain the approach developed collectively, (ii) expand to other villages through participatory learning approaches and (iii) link with private sector to negotiate more balanced farming contracts (WP1)

[Capacity to implement the method]

Number of households acting in accordance with village land use and development plans (e.g. manage livestock in dedicated livestock areas): Increased by 50% after project intervention

Number of village leaders who dedicate more than 10 days per year to coordinate the implementation of village land use and development plans: Increased by 50% in target villages

Number of village community members that are knowledgeable about agroecology practices: Increased by 30%

[Expansion of method and results to other villages]

Number of villages where the method and/or the innovations developed are applied: a minimum of 2 other villages for each target villages with the support of other projects or spontaneously.

[Link with the private sector]

Number of private companies involved through the implementation of village land use and development plans: At least 5 companies contacted and involved in value chain development with target village communities

Capacity-building of local stakeholders was a big concern for EFICAS project.

At community level

A first challenge was to involve the whole community (men and women) in the project approach. In the visited target villages, **villagers assure that the PLUP is mostly respected** (but with frequent problems with villagers from neighboring villages). There is a social pressure as the PLUP is endorsed by village authorities: it means that villagers have to follow the PLUP but also that if there are some people disrespecting the PLUP, it can be hidden to give the impression that the village is compliant with official decisions. It would be interesting to check this information by other means (for example aerial photography to check if there is illegal clearing in conservation forest, monitoring of cattle to observe roaming area).

Regarding the **involvement of leaders in village land use and development plans**, all the leaders met seem quite active. All of them were able to provide data on activities conducted in the village and results achieved. Nevertheless their capacities to mobilize the whole community (beyond their own family) are very different from a village to another. The local leadership style (different from a village to another) is a parameter EFICAS had to deal with.

Regarding the **level of understanding about agro-ecological practices**, it is a result difficult to assess. Even the translation of agro-ecology concept in local language is a challenge (for example at technical services level, agro-ecology is frequently understood as conservation agriculture and reduced to DMC- direct seeding mulch-based cropping- technic). Furthermore, a basic principle of agro-ecology as diversification of species and varieties remains difficult to implement regarding social context. For instance in one village of Houaphan province, all the farmers chose to plant several hectares of fruit-trees but all of them chose to plant the same variety of orange-trees (the one with the best market prices at present time). It is quite contradictory with agro-ecological approach and risk management (diversify species and varieties in order to have an orchard more resistant to pests and disease, to be less vulnerable to climatic and market hazards) but the collective action is dominating in decision process. The innovation path is a long term process and remains highly dependent on leaders' position. Nevertheless EFICAS supported "**pilot households**" (instead of farmers' field schools) and some of them have developed well integrated and diversified farming systems that could be example of local agro-ecological practices for neighboring farmers in the coming years.

Even if it remains difficult for the communities to implement a whole set of agro-ecological practices, some innovations developed in target villages already raised attention from neighboring villages. Almost all the target villages visited by the evaluation mission reported that **neighboring villages are interested by fodder plots implementation** and are already purchasing seeds or grass cuttings to this end. It would be interesting to interview neighboring villages to assess their level of understanding of livestock intensification approach and to know if they have in mind the importance to define a land use plan at community level before fencing areas for livestock production.

At DAFO staff level

At district level, every village was supported by one part time DAFO staff (they had also to perform activities in other villages out of EFICAS project). Most of the time, each DAFO staff has one specific background (vegetal production, animal production, forestry...) focused on technical aspect and the systemic approach is not part of the academic curriculum. The extension scheme is very conventional, DAFO is supposed to train farmers to apply more efficient technics. Thus the agrarian system approach of EFICAS is challenging for DAFO staff.

EFICAS project approach regarding capacity building for DAFO staff was **learning by doing** (strong methodological support, regular missions of technical assistants, facilitation of technical trainings and facilitation of serious games). DAFO staff had also the opportunity to attend all the technical trainings (regarding different technical topics like composting, animal health, SRI...) organized for farmers. Few training sessions were specifically organized for DAFO staff on GIS use and soil analysis.

The **capacity building at DAFO staff level is a challenge because of the high turn-over and the chronic lack of personnel**. How DAFO staff took advantage of EFICAS support to build on their capacities is quite different from a person to another. The personal motivation is quite decisive. At least, DAFO staff gained **skills about livestock production technics** (animal health, fodder plots implementation and management).

The most involved staff improved their capacity in innovation facilitation. Regarding the EFICAS experience, the Phoutong village case is exemplary. The DAFO staff worked very closely with EFICAS project and is regularly present in the village (he learned the local language). After 2 years working with EFICAS project, he developed a very comprehensive understanding of landscape approach. He also changed his posture, trying to coach farmers in the innovation process instead of acting like a lecturer (he regularly participates to farmers activities to demonstrate technics; he is very interested by facilitation methods like "serious games").

Serious game : a multi-functional tool for capacity building at community and DAFO level

A serious game was designed to simulate agrarian transformation and landscape evolution as innovations (new practices, development of cash crops) are adopted. The simulation game was a role play designed regarding uplands context (parameters have to be adapted to each context). 8 to 10 players have to take decision every year about how they use their resources (forest, land) and which crops and practices they want to implement on their fields. Climatic and market hazards are also integrated in the simulation game. The game is played in several

rounds to highlight medium term trajectories of agricultural change. The decision of each player is discussed after each round, making it possible to better understand individual strategies.

This simulation game can be used in several purposes :

- to understand local trajectories of agricultural changes,
- to support community analysis of opportunities and constraints,
- to reach agreement on priorities for innovation.

It is a multifunctional tool (diagnosis, scenarios building, facilitation). The playful approach makes it possible to better involve local communities and DAFO staff and make conceptual questions more accessible.

The weaknesses of this tool are the skills required to parameter and facilitate the game. Furthermore each session can be played by only a few people and lasts several hours (difficult to make all the villagers play).

One option could be to couple simulation game with other facilitation tools (in a playful approach) such as forum theater.

At PAFO staff level

At PAFO level, the capacity building approach is the same than at DAFO level. One PAFO coordinator was identified for each province and fully collaborated to EFICAS activities (coordination between DAFO staff and EFICAS coordination at national level, participation to key-activities such as inputs and equipment distribution).

At PAFO level the team was stable all along the project. EFICAS project participated to **technical capacity building** (especially regarding livestock production technics and the way to implement them with farmers). There is a good **ownership of landscape approach**, the serious game raised attention as facilitation tool.

Regarding links with private sector

As market outlets are decisive to ensure diversification of production systems, EFICAS project established links with several companies, especially for sticklack trading, coffee and soybean.

At this stage, it is not clear how these contacts have conducted to concrete actions.

4.3. Result 3: dissemination of results to national level policy makers and up to regional network

R3. Project results are disseminated to national level policy makers and up to regional networks (WP3)

[National level]

Number of policy briefs released in Lao language: at least 3 policy briefs

Number of national workshops/ events where project results were presented: at least 3 events

[Regional level]

Number of policy briefs released in English on regional networks: at least 3 policy briefs

Number of regional workshops/ events where project results were presented: at least 3 events

Monitoring and evaluation impacts oriented

Dissemination of results is an important achievement in EFICAS project. First the dissemination of results is based on **a good capacity to produce and analyze relevant data**. The limited number of target villages (with always a control village coupled to a target village) in diverse contexts and the strong monitoring and evaluation system make it possible to have a comprehensive understanding of agrarian dynamics.

Regarding the monitoring and evaluation systems, different tools were developed. A periodic survey at community, households and plot levels was conducted and contributed to better understand the initial situation. This periodic survey was conducted in 2014 (baseline) and 2016 and is expected to be conducted again in the second semester 2018. Results from the 2016 survey do not highlight differences between intervention and control villages but it does not mean that EFICAS project is not impactful. Changes in agriculture are quite slow; results from improved livestock systems and income-resource diversification process are expected to be visible after at least two years after investments. As activities implementation started in 2015 and really increased in 2016, it is difficult to observe changes in 2016. **The 2018 survey will be more useful to evaluate socio-economic effects and first impacts of EFICAS project, especially regarding different aspects of resilience** (evolution of assets, evolution of incomes, inequalities evolution, poverty reduction, etc.).

Furthermore **remote sensing data were used to analyze land use evolution** (land use cover and land cover change LULCC) between 2015 and 2017 both in intervention and control villages. At this stage there is no visible change between control and intervention villages but it would be interesting to continue the analysis with bigger time series. This analysis of LULCC may also help to evaluate carbon storage at landscape level as environmental indicator.

Even if all the data are not available at the end of EU phase project, the baseline is quite strong and the monitoring on effects and impacts will be continued on AFD funding. NUDP is also interested by the M&E approach developed under EFICAS project. The methodology, tools and available results were capitalized and shared (including thanks the Lao Uplands Initiative) and NUDP would like to disseminate it across the different provinces where NUDP is implemented.

In addition **several complementary studies** were conducted on

- Farmers decision process along the maize boom trajectory
- Feeder roads opening impacts on livelihoods and ecosystem services
- The role of pigeon pea in uplands sustainable management

These thematic complementary studies are quite interesting because they help **to understand the complex changes in agrarian systems in uplands** and to have a more **systematic analysis regarding dynamic in uplands**.

Events and communication tools to disseminate information

The dissemination of analysis and results was organized through a capitalization process which started in 2017: the **Lao Upland Initiative (LUI)**.

The Lao Upland Initiative was organized with the Ministry of Agriculture and Forestry and the **Northern Uplands Development Programme (as permanent secretariat)**. The results were presented at the Sector Working Group of Agriculture and Rural development (SWG-ARD) and several workshops were organized in collaboration with a wide range of organizations (governmental agencies and development partners and projects, including CARE).

Before the Lao Uplands Conference that was organized as culminating point of the Lao Uplands Initiative, several LUI preparation workshops were facilitated by EFICAS to produce 7 learning briefs in Lao and English:

1. *Alternative futures*
2. *Vulnerabilities and adaptation*
3. *Landscape approaches*
4. *Green extension*
5. *Bringing agroecology to market*
6. *Youths in agriculture*
7. *A vision and roadmap for sustainable development*

In addition, EFICAS project has organized 5 national events. The last one, in March 2018, has gathered 250 participants and corresponded to the Lao Upland Conference. EFICAS preliminary results were also presented in several national and regional conferences (including in the agro-ecological learning alliance in South-East Asia ALISEA <https://ali-sea.org/>).

EFICAS project made also the **information available online**. All project communications and documentations are available at: <https://www.eficas-laos.net/>. All data collected in villages (periodic surveys) are available online: <http://date.eficas-laos.net/>. The EFICAS project also contributed to the Lao Upland Initiative <https://laouplandsforum.org/> with all presentations of the Lao Upland Conference available.

The capitalization process was quite effective and information has been made available to different audiences. The **participative approach** and the organization of several thematic preparation workshops contributed to create a momentum (instead of just a final event and publication at the end of the project).

5. Impacts

Most of CADP activities were implemented in 2016/2017 after PLUP revision and CADP definition. Furthermore, according to the participative innovation process, the activities were started at small-scale by communities to test it and evaluate it before expanding. Consequently it **is difficult to fully assess impacts in 2018**. The evaluation team tried to identify trends and have a qualitative analysis of first effects and impacts of EFICAS action. The 2018 survey (at community, households and plots levels) in intervention and control villages will provide more comprehensive and quantitative understandings of first changes in communities' livelihoods.

Livestock production intensification: visible change at landscape level

According to villagers, the most visible changes are linked to livestock intensification. Livestock was already a pillar of resilience for communities (living saving in case of crisis or problem on rain-fed crops) but EFICAS project has contributed to increase livestock production performance. Although no data can yet confirm it, the development of fenced pasture and fodder plots is seen as a small revolution and raise enthusiasm of villagers. Thanks to the first actions on animal health, pasture fencing and fodder plots development, villagers say that **livestock production has already increased**. According to them, the reproduction rate is higher and animals have a better growth. As there is more control on herds, animal loss and theft have also decreased. This has two consequences: families have increased their herds but are also able to sell more animals each year with a positive impact on their living standards (improvement of housing, education for children).

Villagers compare the traditional model of livestock production and the model supported by EFICAS project. In the traditional model, livestock is free-roaming in fields and forest. It is quite difficult to catch animals to do vaccination and there is very little control on herd (no detection of sick animals). Villagers underlined the fact they used to spend several days in forest to catch the cattle (and sometimes to realize that cattle already died). The livestock production model supported by EFICAS project is also perceived **as more efficient while saving time**.

Livestock intensification: leverage for further change

The intensification of livestock system production may be a first step to further evolution. As there is an important demand for meat (raising meat consumption in Laos and in neighboring countries), livestock production is seen as a major opportunity. Several farmers met during the evaluation are investing in individual fodder plots in order to start or increase their livestock production and to **reduce or even stop upland rice cultivation and buy rice with incomes from livestock**. The size of the herd to be able to cover rice needs by selling animals depends on the type of animal (goats, cattle or buffaloes), the reproduction and mortality rate of the herd, the size of the family and the price fluctuations on the market. For example a farmer indicates that its herd of 8 heads of cattle is big enough to get a calf to sell every year and buy rice for the whole family (5 people). Nevertheless, the livestock production remains exposed to different risks herders have to cope with (diseases than cannot be prevented by vaccines or loss of animals due to exceptional long cold period in winter time as happened in 2016) and strong specialization in livestock production is risky for smallholders.

Many villagers took advantage of EFICAS support to invest in livestock production but have also in mind to **diversify cash-crops with higher added value products (fruit-trees, cardamom, vegetable gardening) in the coming years** thanks to the incomes generated by livestock production. It is difficult for villagers to invest in several different activities at the same time (especially activities with no immediate return on investment such as fodder plot establishment, plantation of fruit-trees or cardamom). **Investments are progressive**, according to capital and labour-force availability. Furthermore many villagers wait to see how “pioneer” farmers (usually village leaders and also families with more capital available) deal with innovation before investing in something new. The transition to more ecofriendly intensive resilient agriculture is a **multi-year process** (trend visible at pioneer families’ level after 3 years but at least 5 years to observe changes at the whole community level).

In villages where the livestock group supported by EFICAS has gathered almost all the livestock owners, the change in livestock production system has already an indirect **impact on cropping systems productivity**. As the villagers put their livestock in a fenced livestock area, villagers say that damages on crops by free-roaming livestock have decreased (but not disappeared as livestock from neighboring villages continues to damage crops).

The livestock intensification may be considered as a **good first step towards eco-friendly and climate-resilient agriculture** but the process must be completed. Next stages to reach are the **higher diversification of cropping systems (including legumes) and the better integration between livestock system and cropping system** to favor soil fertility management (manure collection, compost fabrication and use, agroforestry integrating livestock, for example orchards associated to fodder). The establishment of fenced livestock area and the better control of animal roaming set the condition for cropping system diversification (less dependence on upland rice production for food security, less damage on crops, more capital available, more manure available for soil fertility management).

Include all the households in the dynamic: a challenge

Transition to more eco-friendly and climate resilient agriculture is ongoing but **one question raises attention**: the inclusiveness of change at community level. The participative innovation process was facilitated by EFICAS to **involve the whole community**. Regarding PLUP and CADP definition, the whole community (men and women) was invited to take part to the process. General village assemblies were also organized in each village to implement activities under CADP. 82% of households have taken part to at least one CADP activity supported by EFICAS¹. Nevertheless the capacity to invest in new activities, especially in livestock production, is different from a family to another and families who already have livestock were more able to catch EFICAS opportunities. **The livestock intensification can be a factor of differentiation in the community**: families with sufficient capital can invest and take advantage of EFICAS support to relatively quickly develop profitable livestock production in collective area while poorest families are left behind. This differentiation can become a source of conflicts. If the collective livestock area is profitable for

¹ EFICAS tried to identify households who have not participated. Two categories can be schematically identified. The first one is families with incomes from off-farm activities (civil servants in local administration, small business and are not interest to invest in agriculture sector. The second one is marginalized families with social issues: elderly people without labour force, disabled, and families with drug issues.

only few families, the other families could call the use of this collective area into question. Furthermore families with no access to livestock production have less land available for cropping system rotation (even shorter fallow duration) and have reduced capacity to invest in cropping system diversification and intensification. At this stage, innovations supported by EFICAS for cropping system diversification and intensification do not appear as promising and performant as innovations regarding livestock production.

In several villages, some families without livestock took advantage of EFICAS support to develop fodder plots and sell seeds or grass cuttings: this strategy is very transitional as the demand for fodder seeds is probably not sustainable but it contributes to integrate more families in the dynamic. In two villages, the evaluation team noticed that **solidarity mechanisms were tested to help few families to start livestock production**. In the first case, village asked for “animal fund” to EFICAS project and one animal was given to each poor family (but some families failed to keep the animal alive). In the second case, families who already had a small herd accepted to sell heifers to other families in the village (it is also a way to prevent heifers coming from outside so the risk of sickness contamination is reduced during outbreak of foot-and-mouth disease occurring in Houaphan province). It is quite clear that EFICAS project is not shaped to target the poorest or marginalized families who are really in survival strategy: the investment in agriculture is almost impossible for families with almost no labor force or access to land. Nevertheless it seems quite relevant to look for mechanisms to make investment (in livestock or in other income-generating activity) possible for the largest number of households active in agriculture sector.

The impacts of communities’ capacities

In addition to visible changes due to livestock intensification, a second major change pointed by villagers is **capacity building**. The **participative approach of innovation and the facilitation** provided by EFICAS staff to test and assess new technics or crops have contributed to **foster exchanges of experiences at village level**. According to women, the EFICAS project has opened perspectives and pushed villagers to test new things by themselves. It also raises attention on market demands and diversification possibilities. For example some farmers want to try galangal or wild tea production.

6. Sustainability

The different aspects of sustainability have to be considered regarding changes in agricultural practices (environmental aspects, economical aspects, social aspects).

Regarding livestock intensification

Considering improved pastures, different issues are identified regarding sustainability. At this stage, most of the improved pastures are recent (less than 2 years after implementation).

At technical level, the pasture sustainability depends on **management practices**: weed control (regularly cut the weed left by livestock and in concurrence with fodder species), control the livestock density (avoid overgrazing). Until now, the involvement of livestock owners in pastures management is variable: many are still in an investment phase with limited labour-force and give priority to fodder plots extension. Nevertheless many of them are aware that weed control is important to maintain pasture quality. Some have already in mind to divide the pasture plot in 2 parts so one part can be grazed by livestock while in the other one fodder is growing.

Regarding **social sustainability**, there is a specific issue about **collective pasture and fodder plot governance**: who has access to collective pasture and fodder plot and what are the conditions to use it. At this stage, **there are no standard rules** but the EFICAS project has facilitated the discussion amongst group of farmers. In few cases, households who want to be part of the “livestock group” and let their herd in the collective fenced area for livestock have to pay admission fee as these households did not participate to the fencing work. Rules should also be adapted as the situation evolves (it seems quite difficult for villagers to anticipate coming problems and solutions). At the initial stage, the fencing of livestock area is an investment at community level (even with EFICAS subsidies, the communities had to provide wooden pole and labour-force to build the fences) and this work was made by the “livestock group” supported by EFICAS. In most of the cases, the livestock group gathered all the livestock owners (and also sometimes families without livestock) but not systematically. Furthermore some families did not have livestock at this initial stage but bought some livestock later.

As highlighted in the project context, the households’ strategies are linked with their labour-force and capital availability. Households in “stepping up” strategies are more likely to catch opportunities offered by EFICAS project. **The more capital and livestock a household has, the more this family is able to take advantage of livestock intensification** (invest in fodder plot, increase its herd to value the access to fenced livestock area). The governance of collective pasture area and fodder plots is important to avoid “first come, first served” strategy (and inequalities increase that could threaten social cohesion) especially in villages where there is already important differences between households assets. The governance should be **inclusive** (include all livestock owners, households starting livestock production but also households without livestock?) and should **set efficient rules for sustainable pasture management** (regulate the livestock density and forage cut to prevent pasture degradation). The contribution to maintenance costs (weed control, maintenance and replacement of fences and water system) must be acceptable for the different categories of villagers. At this stage, the level of contribution to

maintenance cost or work in collective plot is almost the same for a family with 15 heads of cattle and a family with 2 heads of cattle in the collective pasture area.

Regarding sustainability, it seems important to **clarify several questions in each village**:

- Are all the livestock owners involved in livestock collective area? If not, why?
- What are the conditions to join the “livestock group” and have access to collective pasture and fodder plots?
- How the different uses of pasture resource (grazing, cutting, seeds collection) are regulated?
- Regarding fair access of all households to the collective livestock area or fodder plots, is there a limitation of the number of animal each household can make graze in the collective livestock area?

As the management of collective pasture or fodder plot seems complex, one solution envisaged by farmers to face this problem is to **divide collective plot in individual plots and fence each individual plot**. Before dividing and fencing collective plot, it is quite important to clarify what are the conditions to fence an individual plot inside the collective plot (who has right to get an individual plot, how the limits of each plot are defined, etc.). This option implies an additional investment, so probably only the wealthiest households will be able to fence individual plots by themselves. Furthermore the fencing of individual plots implies that the access to collective watering point may become difficult.

Regarding cropping systems

Considering the sustainability of cropping systems, the main issues are to introduce practices that contribute to soil fertility and reduce soil degradation and to develop income-generating activities. The alternative to the traditional cropping system are still low at this stage and cropping diversification has to be increased to have a positive impact on soil fertility.

A common issue to all diversification crops is **the link between farmers and markets**. Most of the time, it seems that market exists but there is a lack of information about markets in villages and also a lack of connexion (few middlemen). This issue was clearly identified by EFICAS project but remains a constraint to sustainable diversification of cropping systems.

A second common issue is the **access to inputs, specifically seeds and seedlings adapted to local context**. EFICAS has contributed to make a wider range of species and varieties available at community level. EFICAS has also supported seeds conservation capacities (specific technical trainings) and nurseries for fruit-trees so that communities can produce their own seeds and seedlings.

The present level of **integration of legumes in cropping systems** is too low to have an impact on soil fertility. Nevertheless communities maintain **small stocks of seeds (when varieties introduced by EFICAS have good performances)** cultivating small legumes plots every year, thus the legumes production could increase in the coming years if market outlets are identified.

At technical level, the sustainability of **vegetable gardens** depends on the capacity to develop integrated pest management practices and to maintain soil fertility. Communities received

training about pest management (but not possible at this stage to know how these practices will be adopted) and the development of livestock production increases manure availability especially when vegetable gardens are not too far from livestock production area. At community level, as several vegetable gardens (and water systems) are collective, the governance could become an issue regarding sustainability: how are allocated plots in the collective vegetable garden, are the plots big enough to develop an income-generating activity, what are the mechanisms to maintain and replace collective infrastructures (fences, water system, greenhouses)?

Regarding management of collective equipment

EFICAS project has provided small equipment to improve labour productivity (brush cutters and forage slashers for livestock production, rice threshers...) and to reduce exposition to climatic hazard (motor-pump for paddy fields).

All of this equipment was given to the community or to farmers groups under collective management. Mechanisms of management are weak and do not permit to gather enough money to fix the broken equipment or replace it. The discussion with farmers highlighted that many collective equipment are almost not used, collective management is considered as too constraining and inefficient (equipment not available at the right period, too much time lost to pick up the equipment and bring it back, high probability to suffer equipment breakdown). When equipment is considered useful, farmers prefer to purchase individual equipment as soon as they have enough money to do it. Regarding sustainability, EFICAS project should **focus on innovative equipment demonstration** (buying one or two equipment per village to test it) and possibly provide support for equipment purchasing at individual level if such support is relevant (facilitate linkage with equipment sellers, subsidies for poorest households).

7. Conclusions and recommendations

EFICAS project is a **research-action project focused on agrarian transition and participative innovation** in Lao uplands. The 8 intervention villages offer a diversity of contexts (topography, acces to market, ethnic minorities) representative of Lao uplands development challenges.

EFICAS based its methodology on participative approach of land use planning and innovation at landscape level. Land use planning was defined with the whole community and then a community-based agricultural plan was discussed after problem census by the community itself. Many differents “innovations” (at least social or technical innovation from the perspectives of communities) were tested in response to communities demands. This process of participative innovation takes time but fosters ownership and capacity building at community level. **The implementation of activities was quite progressive** (testing phase first, adoption at small level by “pioneers” and then wider diffusion of the innovation amongst the community) and the pace is defined by agricultural season. Furthermore the innovation capacity but also the investment capacity of communities are limited so **at least 3 years are needed to start to observe changes at community level.**

In land use planning, EFICAS project has supported communities to **define areas dedicated to different productive uses** : livestock area, cropping production area (sometimes with a distinction between trees plantations and annual crops). As materialization of land use planning in the field, EFICAS project supported permanent fencing around livestock area. Different innovations aiming at livestock intensification (including fodder plantation and processing) were also tested in accordance with CADP. This **combination of land use planning, permanent fencing and livestock intensification technnics** is considered as a major innovation by communities. Effects are already visible at herds level, landscape level and also to a certain extent at community level (especially for households owning livestock). These achievements regarding livestock intensification foster communities commitment to test other innovations. **It is a first decisive step towards eco-friendly and resilient agriculture but it is a 5-10 years process to be continued.** There is a balance to be found between livestock production and diversified cropping system in order to make the whole system more resilient to climate and market hazards. The diversificaton of cropping system is highly dependent on market opportunities at local level (connection between private sector and farmers). Diversification should also focus on legumes (in regard to soil fertility management) and on high added-value products that take advantage of comparative advantages of moutainous areas (organic/safe fruits production, medicinal products,...).

The 16 months extension funded by AFD could focus on the following priorities:

Support mechanisms to make livestock farming more inclusive.

First of all, it would be interesting to **assess the level of inclusiveness of livestock activity** (distribution of buffaloes, cattle and goats among families) and to **have a typology of households regarding their capacity to invest and their guarantees** (for example: capacity to invest by themselves, capacity to obtain a loan from a bank or a microfinance institution, capacity to obtain

a loan from a project, etc.). It would also be interesting to identify which families would like to start livestock activities and what are the barriers to overcome.

Secondly it is important to **clarify what are the conditions to access collective livestock area and collective fodder plots**. The conditions to be a member of the “livestock group” have also to be discussed in each village. These conditions have to be adapted to be as inclusive as possible (an investment made with EFICAS financial support cannot be “privatized” by few families setting conditions impossible to reach for other families to access the group and the collective infrastructures). Actions should be focused in villages where high level of inequalities between households are identified and where the access to “livestock group”, collective pastures and fodder plots is the more restrictive (for example where many families owning livestock are not included in livestock group).

Finally mechanisms could be developed to make it possible for each category of households to access quickly to livestock production. The **coordination with other projects** could be reinforced to give better access to specific loan to buy cattle/goats. **Synergies with existing endogen mechanism of solidarity** could be developed (combine subsidies from the project and counterparties from the community: heifer or young goat given or sold at reduced price to poorest households in exchange of new investment at village level). The coordination with NUDP should be continued.

Provide support to collective pastures and fodder plots management (weed and shrubs control, livestock density control)

At this stage, many households gave priority to investments in livestock production (fencing, fodder plots establishment). It is not clear how management practices are implemented to maintain good performances of pastures and fodder plots.

A **rapid assessment of collective pastures and fodder plots** may be useful to check how collective pastures and fodder plots are evolving (level of shrubs and weed development, indicators of overgrazing, condition of the fencing, number of animals that can be sustainably raised without further forage improvement etc.) to better identify management challenges. EFICAS should **strengthen technical capacities** (practical application of management technics) but also **facilitation regarding collective organization** to implement management practices in collective pastures and fodder plots (division of labor, rules for the regulation of livestock density).

Set up management mechanisms adapted to each existing collective infrastructure

EFICAS has supported the investment in many collective productive infrastructures (fences, livestock watering systems, stalls, greenhouse for vegetable gardens, etc.). At this stage, there is no clear mechanism to define **how maintenance and replacement will be done and who is going to contribute**.

It would be necessary to identify collective infrastructures in each village. For each category of infrastructures, it would be necessary to define what is the maintenance to be done and how much it costs/ how many days of work are required every year. It is also necessary to evaluate depreciation costs and to define with the community **how funds can be constituted for infrastructures replacement**. The management and the governance of such funds should be

clearly defined and respect basic rules such as participative management, monitoring of incomes and expenses, transparency, mechanism of control.

Support cropping system diversification

Cropping system diversification remains a challenge. To better monitor cropping systems evolution, it would be interesting to **define an indicator regarding the level of integration of legumes in cropping system** (for example legumes as monocrop or legumes intercropped with other annual or perennial culture at any stage of the annual rotation in comparison with the total surface cultivated during the year).

As markets opportunities seem to be essential to decide farmers to increase legumes production, a specific attention should be given **to develop more linkage with private sector**. Synergies with projects or organization working on value-chain development could also be an option.

Concerning diversification EFICAS project should support farmers initiatives on new diversification options (such as galangal or wild tea) when market opportunities are clearly identified. The more diversification options are tested, the more farmers are likely to find options that match with their needs and capacities.

Furthermore EFICAS project should **continue to provide varieties to be tested in local context** (it seems quite difficult for farmers to have access by themselves to new varieties and DAFO technical centers are not able to provide this service).

Continue to strengthen capacities regarding animal health

Animal health is a major risk for livestock production. EFICAS project has achieved good progress regarding vaccination (almost all the buffaloes, cattle and goats vaccinated twice a year). Efforts on animal health should be continued and focused on capacity building of village veterinary workers at technical and logistical level (check the availability of vaccines in each village).

Increase coordination with other projects regarding paddy field irrigation

Development of irrigation scheme and building of new paddy fields require specific skills and high financial investment out of EFICAS capacities. At this stage, it seems wise to stop investment regarding irrigation and to identify project or organization specialized in this area.

8. Suggestions for up-scaling

EFICAS project is a research-action project conducted at very small-scale with only 8 intervention villages in 2 provinces. This pilot approach developed has raised interest and enthusiasm of both communities and authorities (at local and national level) even if the process of transition to ecofriendly intensive agriculture systems is still ongoing. There is also a demand from neighboring villages. The good coordination with NUDP as EFICAS project is also part of the “conservation agriculture” component of NUDP made it possible to share lessons from EFICAS experience (including capitalization of experience through LUI) and to develop synergies with other NUDP components (including dissemination of methodology guidelines regarding participatory agricultural land planning, monitoring and evaluation approach, serious games as facilitation tool, etc.).

At this stage, there is an **interrogation about up-scaling possibilities**: what would be the conditions to disseminate EFICAS experience in a larger number of villages and what would be the different costs?

The up-scaling process could be based on **several principles**:

- ✓ The **landscape approach** means to coordinate the action between several villages. It seems relevant to **work with villages clusters** to reach more impacts (for example regarding livestock free-roaming regulation, forest conservation or watershed management) but also to be more efficient (less travel for technicians or experts, critical mass of production to negotiate contracts with private sector for value-chain development).
- ✓ **The transition to more efficient eco-friendly agriculture system is a multi-year process** that must be supported during at least 5 years (depending the kind of investment, longer than 5 years for fruit-trees for example) to reach significant results at landscape level. Three different phases can be schematically defined (trust-building and planning (PLUP-CADP) phase, testing phase and consolidation phase) with specific concern for each phase.

Phase	Activities	Concerns
Trust-building and planning phase (1-2 years)	Problem census Participative planning, PLUP and CADP planning Visit tours	Community mobilization Inclusiveness and ownership of the process
Testing phase (2/3 years)	Structural investment (fencing of collective livestock production areas,) Community capacity building on animal health Tests at small-scale (“pioneers”), focus on technical issues	Technical learning by doing Community capacity building

Consolidation phase (2/3 years)	Investments at individual level Extension of innovation adapted to local context/accepted by the local farmers Focus on management and governance issues	Sustainable governance and management of collective areas (pastures, fodder plots) and infrastructures (water systems, greenhouses...)
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- ✓ The trust-building phase is critical to get the community involved and to convince farmers to test new practices (at organizational or technical level). Regarding EFICAS experience, the organization of **study tours in intervention villages** can help to make the landscape development approach easier to understand for communities beginning the process in the same area. These study tours should integrate several objectives :
 - explain the **different steps of the development process** (not focus only on CADP implementation but also stress attention on planning tools as PLUP and CADP and participative M&E of progress) ;
 - highlight the **integrated approach of agricultural system** (not focus only on livestock production but showcase the articulation between livestock production and cropping system) taking example of model households;
 - Stress attention on **participative approach and learning process** (learning by doing, testing method, participative monitoring and evaluation by VLMC).

To facilitate farmer to farmer exchanges, these study tours could be organized between communities belonging to the same ethnic group. Groups involved in study tours should include village leaders but also representatives of different types of farmers to get the whole community involved.
- ✓ The prerequisite to any investment at village level must be the **participative definition of a PLUP and the definition and a multi-year CADP**. **Facilitation tools such as simulation games** should be implemented to better understand local trajectory of agricultural change and build scenario with villagers. The PLUP must be detailed enough to clearly identify areas dedicated to different agricultural uses (cropping production area, livestock production area, orchards area, etc. in accordance with each village context). The CADP must be in accordance with this PLUP and in coherence with problem census made with the whole community. In PLUP and CADP definition, the process is as important as the final result. The process must be inclusive (effective participation of the whole community during all the process) and pedagogical (facilitation tools to help community to get issues, respect of community pace in elaboration of PLUP/CADP). A village land management committee including women must be set in place.
- ✓ Support **monitoring and evaluation** system. The monitoring and evaluation system must report activities conducted under CADP but also monitor changes at community level. This monitoring and evaluation system must be a participative tool for learning and help to discuss progress and difficulties to overcome year after year. It must also provide relevant information to help coordination of intervention between DAFO/PAFO and projects specialized on specific topics (livestock, infrastructures ...).

- ✓ The EFICAS project experience highlights the importance to **rapidly start actions in the field right after the participative planning** (PLUP and CADP) phase. A minimal investment budget is necessary at village level to **financially support structuring investments**. Regarding EFICAS experience, priority actions to be financed are fencing and furniture of a diversity of seeds and seedlings. The erection of permanent fences is a big investment but is a prerequisite for many agricultural innovations (livestock production intensification, cropping system diversification). The fencing of collective areas dedicated to a specific use (livestock production area, orchards area, or vegetables gardens area) is a priority to start the intensification process. The support to water system development for livestock watering is also a priority. Furthermore, capacity building on animal health is essential to manage epizooty risk (major risk for livestock intensification). As the access to a diversified range of seeds and seedlings is a challenge for communities but a prerequisite to sustainable diversification, a financial and technical support should be provided to purchase and test seeds and seedlings (to improve performances and diversity of existing productions but also to test diversification options). Concerning seeds, the preference should be given to non-hybrid seeds that can be reproduced and maintained by the community itself.
- ✓ **Synergies with existing mechanisms (NUDP, projects, poverty reduction fund) in Northern provinces** must be systematically considered to implement activities defined in the CADP. This mediation with existing mechanisms must enable to mobilize additional funds (for example for structural infrastructures such as irrigation schemes and roads) and specific skills or stakeholders networks (for example for NTPF valorization or value-chain development).

The up-scaling process would **require specific skills and financial means**. Considering the lack of staff at PAFO and DAFO level (understaffing in most of the districts), the up-scaling method must be progressive (impossible to work in many different clusters at the same time) in accordance with DAFO staff availability. Furthermore the transition towards intensive eco-friendly agricultural system requires technical skills regarding agriculture but also specific skills for overall coordination, land use planning and participative facilitation of the process. For example regarding facilitation, it would be relevant to develop serious games in each area and play simulation games at least with DAFO staff in order to help them to better understand innovation process. Even if efforts were made regarding PAFO/DAFO capacity building, a technical assistance seems necessary to provide methodological support.

This table below is a suggestion on how up-scaling process could be organized for a cluster (4 villages).

Phase	DAFO/PAFO staff mobilization	Technical assistance team	Activities Budget
Planning phase	<p><u>Tasks :</u></p> <ul style="list-style-type: none"> - Coordination with authorities - Logistical facilitation of activities in the field <p><u>Effort :</u> DAFO 4 days/month (per diem + travel costs + communication costs) PAFO 1 day/month (per diem + travel costs)</p>	<p><u>Tasks</u></p> <ul style="list-style-type: none"> - Methodological support to PLUP and CADP elaboration - Process facilitation - Roadmap for CADP implementation - Study tour organization <p><u>Effort :</u> 4 days/month (per diem + travel costs + communication costs)</p>	<p><u>Capacities building</u></p> <ul style="list-style-type: none"> - Study tours - VLCM training for monitoring and evaluation - Serious games, simulation game, participative theater to analyze agricultural changes, build scenario and set priorities <p><u>Budget</u> Depending on the number of people participating to the tour, the number of days (at least 2 days) and the distance between the cluster of villages and the destination.</p>
Testing phase	<p><u>Tasks :</u></p> <ul style="list-style-type: none"> - Technical support to activities implementation in the field (learning by doing approach) - Coordination with authorities - Coordination with projects working in the same area - Contribution to monitoring and evaluation system <p><u>Effort :</u> DAFO 8 days/month (per diem + travel costs) PAAFO 2 day/month (per diem + travel costs)</p>	<p><u>Tasks</u></p> <ul style="list-style-type: none"> - Process facilitation (planning and methodological support) - Technical support to innovation process - Facilitation for seeds and seedlings supply - Community capacity building on monitoring and evaluation - Coordination with projects working in the same area - Coordination with private sector <p><u>Effort :</u> 10 days/month (per diem + travel costs + communication costs)</p>	<p><u>CADP activities implementation</u></p> <ul style="list-style-type: none"> - Fencing of collective area - Water system for livestock watering in livestock collective area - Capacity building on animal health - Access to seeds and seedlings (support to agrobiodiversity) <p><u>Budget</u> Around 2000 \$ /year / village</p>

Consolidation phase	<p><u>Tasks :</u></p> <ul style="list-style-type: none"> - Technical support to activities implementation in the field (learning by doing approach) - Coordination with authorities - Coordination with projects working in the same area - Contribution to monitoring and evaluation system <p><u>Effort :</u> DAFO 4 days/month (per diem + travel costs) PAAFO 1 day/month (per diem + travel costs)</p>	<p><u>Tasks</u></p> <ul style="list-style-type: none"> - Process facilitation (planning and methodological support) - Community capacity building on monitoring and evaluation - Capacity building on management and governance of collective livestock area and infrastructures - Coordination with private sector <p><u>Effort :</u> 4 days/month (per diem + travel costs + communication costs)</p>	<p><u>CADP activities implementation</u></p> <ul style="list-style-type: none"> - Fencing of collective area - Water system for livestock watering in livestock collective area - Capacity building on animal health - Access to seeds and seedlings (support to agrobiodiversity) <p><u>Budget</u> Around 2000 \$ /year / village</p>
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Annex A : ToR final evaluation EFICAS project

- Tendering procedure relating to the final evaluation mission of the EFICAS project

- Landscape management and Conservation Agriculture development for Eco-Friendly Intensification and Climate Resilient Agricultural Systems in Lao PDR (EFICAS)
- Lao PDR Global Climate Change Alliance (GCCA) Programme
- Reference: EuropeAid/132-657/L/ACT/LA

TERMS OF REFERENCE

1. Context, objectives, activities and expected results of the EFICAS project

- **1.1 Context of intervention**

Buffering the shocks from market integration and climate change in Lao northern Uplands

An agrarian transition in northern Laos characterized by:

- **Rapid changes in agricultural production systems** in line with an increased access to neighboring markets (coexistence of market-oriented and self-subsistence agricultural systems) and an increased vulnerability of village communities to climatic and economic fluctuations.
- **Significant impacts on natural resources** (e.g. reduced forest cover, degradation of agricultural land, erosion of biodiversity) **and on village communities** (e.g. overall poverty reduction but increased inequality and indebtedness).
- **Low adoption of agro-ecological innovations** promoted by research and extension institutions (e.g. organic farming, conservation agriculture, agroforestry, integrated approaches such as IPM, etc.).

- **1.2 Project objectives**

Specific objectives: *Support eco-friendly and climate-resilient agriculture intensification through participatory development and extension of agro-ecological systems in Lao PDR*

Specific objectives: *Develop and implement successfully in 8 pilot farming communities of Houaphan and Luang Prabang provinces an original intervention method that support an increased engagement of local farming communities into adaptive planning and implementation of more desirable development pathways*

The key elements of the project are presented below

Location(s) of the action: -	Luang Prabang Province: 2 districts (Viengkham and Pakseng); Huaphan Province: 2 districts (Viengxai and Houamuang). With 2 intervention villages in each district. Project implemented in 8 pilot villages
Duration of the action	48 months
Requested EU contribution	€ 1,556,336 eligible for € 2,190,549 total budget
Objectives of the action	<p>The specific objectives are:</p> <p>1) To engage local communities in designing low-carbon emission strategies at landscape level through Participatory Land Use Planning (PLUP).</p> <p>2) To support villagers in developing and implementing their Community Agricultural Development Plan (CADP), i.e. a strategic plan to manage the village resources, to define priority activities (agriculture, livestock, NTFP...) to be developed for improving food security and developing market oriented production.</p> <p>3) To develop eco-friendly systems adapted to the biophysical characteristics of land zones defined through PLUP and to the needs and expectations of local communities (2 provinces = 2 Centres for experimentations and 4 districts with 8 villages (4x2) with demonstration sites (DAFO).</p> <p>4) To train district implementers, local leaders and village community members in (i) sustaining the approach developed collectively, (ii) expanding to other villages through participatory learning approaches (e.g. Farmers' Field Schools along with demonstration sites) and (iii) linking with private sector to ensure inputs supply and production outlets (exit strategy);</p> <p>5) To disseminate results to national level policy makers and up to regional networks (CANSEA: Conservation Agriculture Network for South East Asia).</p>
Target group(s)	<p>Target group 1: Rural communities including individual farmers, farmers groups, villages' authorities and other stakeholders at local levels.</p> <p>Target group 2: Government authorities at Kumban, District and Provincial levels to support the action and to draw lessons for scaling out and scaling up results.</p> <p>Target group 3: Private sector to ensure inputs supply and link production to markets. Involvement of the private sector in the project activities since the onset. It is part of the project exit strategy.</p>
Final beneficiaries	The poor farmers of 4 target districts in the two selected provinces as proposed eco-friendly farming systems should be both more productive and more adapted and resilient to climate change.

• 1.3 *Expected results*

Three main results were expected:

ER1: Village communities are engaged into the design and the **implementation of low-carbon emission strategies at landscape level**

ER2. Local **stakeholders** (district implementers, local leaders and village community members) have **increased capacity** to (i) sustain the approach developed collectively, (ii) expand to other villages through participatory learning approaches and (iii) link with private sector to negotiate more balanced farming contracts

ER3. **Project results are disseminated** to national level policy makers and up to regional networks

• 1.4 *Activities*

> Activities in line with ER1 (low-carbon emission strategies at landscape level):

Interventions

- Support Participatory Land Use Planning (PLUP) and the transformation of these plans into action plans (Community-based Agricultural Development Plans – CADP),
- Support on-farm experiments and demonstration plots related to crops, livestock, and forest integrated management,
- Facilitation with traders, local agricultural services (DAFOs, PAFOs, Technical Service centers), and other projects to increase the efficiency and the sustainability of the actions.

Monitoring-evaluation

- Intervention/control villages
- Baseline (2014)
- Repeated measurements (2016, plans for 2018)

> Activities in line with ER2 (capacity building of local stakeholders):

Capacity building of producers and Village Land Management Committee (VLMC) members:

- Learning-by-doing: engaging the whole community into the planning and the assessment of CADP annual activities; monitoring of villagers participation into CADP activities/ on-farm experiments and specific support/discussions with the non-participant to involve them into the transformative process,
- Formal training: technical training provided on various technical subjects: animal health, forage technologies, improved fallows, compost production, seeds conservation etc.
- Empowerment of the members of the committee through the establishment of a budget and support for the monitoring and evaluation of field activities,
- Model farmers and activities groups
- Valorization of local knowledge and expertise (e.g. stick lac, SRI)
- Study tour and cross-village visits to foster farmer-to-farmer exchanges
- Gaming-simulations to explore with farmers land use scenarios

Capacity building of DAFO staffs (turning DAFO staffs from lecturers to facilitators)

- Learning-by-doing: learning about participatory landscape approaches through the negotiation of village PLUPs, the negotiation, annual review and adaptation of village CADPs; learning about eco-friendly and climate-smart innovations through their implementation and assessment in target villages
- Formal training: GPS/remote sensing data management, agroecology practices, participation to technical training provided in target villages
- Study tour to learnt from other initiatives
- Gaming-simulations to better understand farmers development strategies, increase their capacity as facilitators of transformative landscapes

> Activities in line with ER3 (results dissemination):

- Consultancy studies and Msc reports
- Presentation of methods and results in different national and international workshops and conferences
- Results dissemination on websites and on-line databases: EFICAS, CIRAD, ALiSEA, CANSEA, uplandforum
- Production of learning briefs as part of the Lao Upland Initiative (<https://laouplands.org/>)

2. Technical terms of reference for the mission

• 2.1 Objective of the evaluation

The objective of the evaluation is to provide all stakeholders (EUD, implementing institutions, MAF authorities) with an independent and rigorous analysis of the project results and impact.

- (1) To evaluate project achievements throughout the duration of the project (March 2014 - March 2018) according to the project document,
- (2) Identify key points and propose recommendations.

2.1.1 Evaluation of the activities implemented between March 2014 and March 2018

This involves assessing the level of implementation of the action, the achievement of objectives, the achievement of results and the transfer to target groups during the duration of the project.

The project will be analyzed according to the following 5 criteria of evaluation:

1. Relevance of objectives and means
2. Efficiency in terms of project management
3. Effectiveness through direct and indirect results
4. Overall impacts and more specifically on target groups
5. Sustainability and outcomes

The consultant(s) will provide an overall description of the intervention's logic, as well as an assessment of the activities implemented regarding their relevancy and efficiency.

The consultant(s) will particularly provide recommendations to the EUD and the MAF authorities in order to **1) take stock of project lessons learnt, 2) ensure the**

sustainability of the action in project intervention areas, and 3) estimate the cost that would be needed to out-scale the intervention mechanisms and actions proposed by the project in other villages.

2.1.2 Identify key points and propose recommendations

One of the objectives of the project was to develop innovative methods both regarding intervention mechanisms (participatory landscape approach) and impact assessment (participatory methods to assess changes in village community resilience to external shocks).

The results obtained by the project in this regard are innovative and go beyond the 8 pilot intervention villages.

This evaluation will focus on identifying and discussing innovative key results of the project in relation to these 2 topics (intervention mechanisms and impact assessment). It will also identify remaining uncertainties and the locks for the dissemination of such methods.

• 2.2 *Implementation of the evaluation*

2.2.1 Methodology

The evaluation team will have access to all relevant information such as:

- Analysis of project documents and products,
- Field visits (Houaphan and Luang Prabang provinces)
- Consultations with stakeholders and project partners.
- Consultation with target groups and beneficiaries

And any other means and actions that the evaluation team deems necessary to achieve. This evaluation will be carried out in accordance with the EuropeAid Procedures Manual.

2.2.2 Organization of the evaluation

- Field mission

Field mission should be carried out before the 10th of June 2018.

- Reporting

Once all the data and information are collected, the evaluation team will present its findings to the project management team, conclusions and recommendations in the form of a preliminary report before June 30rd 2018.

Before finalizing the report, the team should inform the coordination unit about the main findings and recommendations through conference call meetings.

After this submission, the team will have two weeks to amend the report on the form and content and provide the final report.

The evaluation team is independent and fully responsible for its report. Nevertheless, it is not in any way authorized to make commitments to the name of the lessor or the actors of the project.

The content of the report will not reflect the official position of the European Union. In any event, the evaluation will have to be completed and the final report sent on 15th July 2018, at the latest.

2.2.3 The evaluation team

The proposed team will be composed of at least 1 international expert with a good knowledge of Laos and of regional issues in Southeast Asia in general, associated to Lao national expert(s).

The members of the team must be independent, i.e. they should not have been directly involved in the project or in its formulation, or in its execution and technical follow-up.

• 2.3 Offer

The consultant(s) will provide a detailed offer for:

- Proposed consultants (with CVs)
- References of actions carried out in relation to the themes of the EFICAS project.
- References in project evaluation
- Budget and Financial Proposal, number of estimated days

The full offer will be sent by e-mail to the project manager before April 25th 2018 to the following address: pascal.lienhard@cirad.fr

• 2.4 Financial allocation

The overall evaluation budget of the evaluation mission will be **20 000 €**

Annex B: List of Interviews and participants

Date	Activities	Participants	Organization	Position	Location
30 May	Attending to the EFICAS project presentation by EFICAS	Project team	DaLAM-CIRAD	Project implementing agency	Vientiane
30 May	Meeting with the EU Delation	Mr. Ignacio OLIVER-CRUZ		Attach Cooperation	Vientiane
31 May	Travel to Luangprabang				
31 May	Meeting with PAFO Meeting with Section of PaLAM	Mr. Xayaphanh LASY Nr. Phousavanh	PAFO Section of PaLAM	DG Head of section	Luangprabang province
31 May	Meeting with DAFO	Mr. Phonexay Vannadeth	DAFO	DG	Paksean Dist.
31 May	Meeting with EFICAS District team	Mr. Phimpha Mr. Bounghao	Unit of Forests Unit of Livestocks	Head Head	Pakseang District
1 June	Interview with Village Authority Interview with beneficiaries: group of livestock, group of crops, village veterinary and some villagers Field visits	Mr. Boulerth Mr. Khamphanh Mr. Vongsai	Village Authority Village Authority Village Authority	head Vice Head Vice Head Heads of groups Villagers	Houayasam village
2 June	Interview with Village Authority Interview with beneficiaries: group of livestock, group of crops, village veterinary and some villagers Field visits	Mr. Kongmy Mr. Thongla	Village Authority Village Authority	head Vice Head Heads of groups Villagers	Houaya Vat Village

Date	Activities	Participants	Organization	Position	Location
3 June	Interview with Village Authority Interview with beneficiaries: group of livestock, group of crops, village veterinary and some villagers Field visits	Mr. Pheang All villagers	Village Authority	Vice Head	Phoutong Village, Viengkham district
3 June	Interview with beneficiaries: Market group	Mrs. Hao Mrs. Song Mrs. Cholor	LWU Villager Villager	Head of group member meber	Samsoum village
4 June	Interview with Village Authority Interview with beneficiaries: group of livestock, group of crops, village veterinary and some villagers Field visits	Mr. Pao Her Mr. Bounma Mr. Jong Vangxay Mr. Xua Lee Her Mr. Chua Song Mr. Sor Song	Village Authority Farmer model Group of forage and livestock	Vice Head Head of group Head of group Head of group member member	Samsoum village Viengkham district
4 June	Interview with Technical Service centre Field visits	Ms. Pheangsy	Technical Service centre, DAFO	Technician and EFICAS partner	Viengkham district
5 June	Interview with Village Authority Interview with beneficiaries: group of livestock, group of crops, village veterinary and some villagers Field visits	Mr. Keophaeng	Village Authority	Vice Head	Namtip village, Houamouang district

Date	Activities	Participants	Organization	Position	Location
6 June	Interview with Village Authority Interview with beneficiaries: group of livestock, group of crops, village veterinary and some villagers Field visits	Mr. Phet	Village Authority	Vice Head	Houaymanh village, Houamouang district
6 June	Meeting with Houaphanh PAFO	Mr. Kin Thoummala	PAFO	DDG	Samnuea District
7 June	Interview with Village Authority Interview with beneficiaries: group of livestock, group of crops, village veterinary and some villagers Field visits	Mr. Suvanna Mr. Somvang Mr. Xiengphanh Mrs. Lati Mrs. One Mrs. Chum Mr. Ieng	Village Authority Kumban Authority	Head of village head of Kumban Veterenian, village member	Vangseang village, Viengxay district
8-9 June	Travel back to Vientiane via Xieng Kouang				

