TECHNICAL PART OF INTERIM REPORT

Name of the Asia-wide Programme: ASIA INVEST
Contract reference no.: LA/Asia-Invest II/04 (128402)
Project Title: Open Resources for Conservation Agriculture and Trade and Development (ORCATAD)
Name of Beneficiary: Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD)
Period covered by this Interim Report: 1 February 2008 to 31 January 2009
Due date of this Interim Report: 15 February 2009

Project Budget	315,800 EUR
Funds Disbursed by Commission to date	122,854.96 EUR
Expenditure Incurred by Project to date	217,148.44 EUR

Abbreviations and Acronyms

AFD	French Development Agency
ADB	Asian Development Bank
CA	Conservation Agriculture
CIRAD	Centre de Coopération Internationale en Recherche pour le Développement
DAFO	District Agriculture and Forestry Office
DMC	Direct seeding and Mulch-based Cropping systems
EU	European Union
FAN	Faculty of Agriculture of Nabong
FFEM	Fonds Français pour l'Environnement Mondial
LTPC	Lao Trade Promotion Centre
MAF	Ministry of Agriculture and Forestry
MoIC	Ministry of Industry and Commerce
NAFES	National Agriculture and Forestry Extension Service
NAFRI	National Agriculture and Forestry Research Institute
NNRBDP	Nam Ngum River Basin Development Sector Project
PAFO	Provincial Agriculture and Forestry Office
PASS	Rural Development Project for Southern Xayaboury
PCADR	Capitalisation Programme in support of the Rural Development Policy
PRONAE	Lao National Agro-ecology Programme
PROSA	Sector-Based Programme in Agro-ecology

Summary

I. Introduction

Executive summary

In line with the proposed Logical Framework and Action plan, all of the outlined activities were managed. The activities carried out and the main results obtained are shown in the following table:

Year 2 Activities	Expected results	Observations
ACTIVITY 1: Project launch, preparation of a website and selection of field areas	**1a** -Open the project website: A project website is linked to knowledge base on-line	Delay
	1b - Open the project e-forum: An e-forum is linked to the website	According to the EU, NAFRI, WU and CIRAD, this activity was conceled.
ACTIVITY 2: Implementation of conservation techniques	**2b -** Establishing demonstration plots	Completed on more sites than planned
	2c - Verifying eco-friendly products (soil quality)	Completed in Sayaboury Province
	2d - Finalise recommendations for the knowledge base	Started but not finished
ACTIVITY 3: Training of farmers and extension services	**3a -** Prepare multimedia documents	Started
	3b - Training of Trainers	Completed (more than planned)
	3c - Farmers and Extension workers fields school	Completed (more than planned)
	3d - Fields visits	Completed (more than planned)
ACTIVITY 4: Building up of the knowledge base	**4a -** Initial knowledge base on various concepts and practices	Started
	4b - Building of the core of the knowledge base	Started
	4c - Enriching the knowledge base	Started
	4d - Final release	Not yet
ACTIVITY 5: Communication and Dissemination Activity	**5a -** Preparation of dissemination materials	Started
	5b - Organisation of Trade Potential Seminar in Lao PDR	Held in October 2008. National, regional (South East Asia) and international agricultural fair.

To date the project is well advanced in implementing activities and achievement of the PP1
There is not enough expertise in composition of project partnership to achieve the PP2 (trade facilitation and reinforcement of relevant intermediate business organizations' capabilities).
It is necessary to consider the fair trade scheme as an option for the achievement of project purpose 2 through establishing contacts and involving relevant players in Laos and in the EU for the project activities

II. Implementation of Activities versus Work Plan and Logical Framework

II.1. Action Plan for the second year and Logical Framework

The specific objectives of the period are:

- **To build a comprehensive and open knowledge base on best practices in conservation agriculture** for certain cash crops such as rice (varieties with long grains, sticky and/or aromatic rice varieties), tea, coffee, if there will be some opportunities (geographical indication network) to develop these two crops in the mountainous areas of Xieng Khouang Province… This knowledge base will be developed as a web-based application and will serve as an effective tool in the hands of business organisations to encourage the production of eco-friendly agro-products targeted towards a niche market in Europe, specifically in France, thus helping to create a vibrant international and rural economy.
- **To organise capacity building activities for the farmer groups and extension services** of Lao PDR on conservation agriculture techniques.
- **To coordinate with the trade facilitation agencies** such as LNCCI to improvise application of new techniques and technologies, in both conservation agriculture and IT&C for the areas of trade and development
- **To build model demonstration plots** which will substantiate the scope for trade in the produced crops both for international and local market.
- **To build capacities at the institutional level in open source based IT&C solutions** with sharp focus on the application of IT&C to agronomy and relevant beneficiary sectors like trade and commerce.
- **To increase the awareness levels about the potential for international trade and investment in the area of eco-friendly agro-based products** with specific focus on commercially significant crops, through two dissemination workshops, one in the target country and the other in Europe.
- **To produce dissemination material focussing on the prospects for international trade in eco-friendly agro-based products** in the form of booklets, brochures and exhibits and highlighting the importance of conservation agriculture.

Activities

ACTIVITY 1: Project launch, preparation of a website and selection of field areas

a) Open the project website
b) Open the project e-forum
c) Bibliography (Completed in year 1)

d) Prepare and organise an initial workshop in Lao PDR (Completed in year 1)

ACTIVITY 2: Implementation of conservation techniques

a) Bibliography (Completed in year 1)
b) Establishing demonstration plots
c) Verifying eco-friendly products through chemical and biological soil quality
d) Finalise recommendations for the knowledge base

ACTIVITY 3: Training of farmers and extension services

a) Prepare multimedia documents
b) Training of trainers
c) Farmers Fields Schools
d) Fields visits

ACTIVITY 4: Building up of the knowledge base

a) Initial knowledge base on various concepts and practices
b) Building the core of the knowledge base
c) Enriching the knowledge base
d) Final release

ACTIVITY 5: Communication and Dissemination Activity

a) Preparation of dissemination materials
b) Organisation of Trade Potential Seminar in Lao PDR

Initial Action Plan for year 2

Year 1 Activities	Semester 1 1	2	3	4	5	6	Semester 2 7	8	9	10	11	12	Implementing body
1a – Open the project website													NAFRI
1b – Open the project e-forum													NAFRI
2b – Establishing demonstration plots													CIRAD + NAFRI
2c – Verifying eco-friendly products (soil quality)													CIRAD + NAFRI
2d – Finalise recommendations for the knowledge base													CIRAD + NAFRI + WU
3a – Prepare multimedia documents													CIRAD + NAFRI
3b – Training of trainers													NAFRI + CIRAD + WU
3c – Farmers and Extension workers fields schools													NAFRI + CIRAD + WU
3d – Fields visits													CIRAD + NAFRI
4a – Initial knowledge base on various concepts and practices													NAFRI + CIRAD
4b – Building the core of the knowledge base													NAFRI + CIRAD
4c – Enriching the knowledge base													NAFRI + CIRAD + WU
4d – Final release													NAFRI + WU
5a – Preparation of dissemination materials													NAFRI
5b – Organisation of Trade Potential Seminar in Lao PDR													NAFRI + CIRAD + WU

Specific logical Framework for Year 2

Year 2 Activities	Expected results	Indicators
ACTIVITY 1: Project launch, preparation of a website and selection of field areas	**1a** -Open the project website: A project website is linked to knowledge base on-line **1b** - Open the project e-forum: An e-forum is linked to the website	* Operational website and e-forum * Frequents visits/hits * Number of contributors
ACTIVITY 2: Implementation of conservation techniques	**2b -** Establishing demonstration plots **2c -** Verifying eco-friendly products (soil quality) **2d -** Finalise recommendations for the knowledge base	* 2 Provinces * 3 districts/Province * 30 farmers/district * 6 demonstration plots * 100 soils analyses * 10 cropping systems/Province
ACTIVITY 3: Training of farmers and extension services	**3a -** Prepare multimedia documents **3b -** Training of Trainers **3c -** Farmers and Extension workers fields school **3d -** Fields visits	* Availability and diversity of the materials on both soft and hard formats * 1 long term (6 months) practical session in each province * 3 short term (8 days) training sessions in each province * 5 NAFRI Staff (ToT)/District trained * 10 extension workers/District * 200 fields visits
ACTIVITY 4: Building up of the knowledge base	**4a -** Initial knowledge base on various concepts and practices **4b -** Building of the core of the knowledge base **4c -** Enriching the knowledge base **4d -** Final release	* Availability and diversity of the materials on both soft and hard formats * Number of cropping systems with conservation agriculture techniques well described according to the socio-economic and biophysical context, environmental impact and their conditions of adoption by the farmers and their conditions of extension
ACTIVITY 5: Communication and Dissemination Activity	**5a -** Preparation of dissemination materials **5b -** Organisation of Trade Potential Seminar in Lao PDR	* 500 copies of all modules products distributed * 1000 copies of cd-rom distributed * Numbers of participants in the Trade Seminar in Lao PDR

II.2. Activity 1, Project launch, preparation of a website and selection of field areas

The aim of this first activity is to open a website which will disseminate information on the project, including soft- and hard-ware, about conservation agriculture techniques to build a comprehensive and open knowledge base on exemplary practices in conservation agriculture for certain cash crops, staple crops and livestock activities.

This knowledge base will be developed as a web-based application and will serve as an effective tool in the hands of business organisations to encourage the production of market-oriented cash crops, creating a vibrant international and rural economy. A first workshop will be organized in Lao PDR to establish technical description standards and to select the appropriate IT database format.

The main objective is to create an efficient tool of communication on the Orcatad project through the opening of the project website:

- Disseminating information on the project. The website will focus on providing comprehensive information to potential partners and professionals already involved in development projects. Web pages will show the objectives of the programme.

- Disseminating technical information on the conservation cropping and farming systems. This information will be provided by Activity 2 (Implementation of conservation techniques).

- Internal services to support national activities and to share knowledge and know how.

For reasons explained past year, activity 1 was redefined according to political local priorities. Consequently, the website and discussion forum have not yet been opened. In addition to that and according to the recommendations of UE Delegation in Lao, the activities related to forum were stopped.

Consequently, the resources used were as follows:

Resources used

Personnel	Activity	Description	Number of units	
			Planned	Used
NAFRI (Software Developer)	1a	Open the website	5	5
NAFRI (Technician)	1a	Open the website	5	5
NAFRI (Technician)	1a	Open the website	5	5
NAFRI (Trainer)	1a	Open the website	0	0
NAFRI (Agronomist)	1a	Open the website	0	0
Project Manager Applicant	1a	Open the website	0	0
Cirad Senior Expert	1a	Open the website	0	0
WU Senior Expert	1a	Open the website	0	0
		TOTAL ACTIVITY 1a	**15**	**15**
NAFRI (Software Developer)	1b	Implementing e-forum	5	5
NAFRI (Technician)	1b	Implementing e- forum	5	5
NAFRI (Technician)	1b	Implementing e-forum	5	5
NAFRI (Trainer)	1b	Implementing e-forum	0	0
NAFRI (Agronomist)	1b	Implementing e-forum	0	0
Project Manager Applicant	1b	Implementing e-forum	0	0
Cirad Senior Expert	1b	Implementing e-forum	0	0
WU Senior Expert	1b	Implementing e-forum	0	0
		TOTAL ACTIVITY 1b	**15**	**15**
	TOTAL ACTIVITY 1	NAFRI (Software Developer)	10	10
		NAFRI (Technician)	10	10
		NAFRI (Technician)	10	10
		NAFRI (Trainer)	0	0
		NAFRI (Agronomist)	0	0
		Project Manager Applicant	0	0
		Cirad Senior Expert	0	0
		WU Senior Expert	0	0
		TOTAL ACTIVITY 1	**30**	**30**

IT equipment: Hardware equipment for NAFRI,

Running Costs: for Website building

II.3. Activity 2: Implementation of conservation techniques

The second activity aims firstly to develop alternative techniques for conservation agriculture. It will also involve laying out eco-friendly demonstration plots. The quality of these practices will then be studied through their impact on the soil environment. Results from these two studies will be fed into the knowledge base.

As mentioned in the project document, the establishment of the demonstration and training sites and the organisation of visits were NAFRI's contribution to the project, notably through its National Agro-ecology Programme (PRONAE) funded by AFD, FFEM and CIRAD. In addition, other projects were associated with it, notably PASS – PCADR and the Sector-Based Programme on Agro-Ecology (PROSA/MAF). All the documents concerned with Agro-ecology coming from these different projects have been collected and are being translated and converted to PDF format to be referenced in the database and to be freely accessible from the website or in traditional multimedia forms (CD-Rom etc.).
This activity will be done in different ecological systems and in farmer fields where experiments based on eco-friendly techniques will be adapted based on climatic, bio-physical and socio economic contexts. Different main annual crops will be studied. These experimental fields will be also a demonstrating plot for the interested audience. The space for the demonstration plots and their maintenance will be the contribution of the NAFRI.

The demonstration plots were laid out and/or maintained in:

- 4 districts in the south of Xayaboury Province,
- 4 districts in the Province of Xieng Khouang,
- 6 other districts in the provinces of Vientiane, Luang Prabang, Champassack and Xieng Khouang. Because of the partnership contract between PRONAE and the Nam Ngum River Basin Development Sector Project (NNRBDP), this involved support for the establishment of training centres for village development clusters (*kumban pattana*).

In each district more than 100 farmers are concerned.

Taking the natural capital into consideration is the first priority fixed by PRONAE. The main environmental and socio-economic objective will thus be to develop technical alternatives that shall enable the preservation of renewable but not inexhaustible natural resources such as soil and water, and to promote sustainable agriculture that is socially acceptable, economically profitable and environmentally sound. Soil management is the principal integrating topic for all development activities linked to agriculture, livestock, forestry, fishing, preservation of infrastructure, water quality and the quality of life. Centring the approach on soil capital also makes it possible to maintain enough diversity to allow interesting ecosystemic properties to emerge, notably with regards to the natural functions of bio-geochemical regulatory cycles.

To evaluate the impact of eco-friendly practices (based on DMC, Direct seeding in mulch cropping systems) on the soil environment (chemical and biological parameters), it is important to study these impacts on soil biology, in particular, the soil fauna. To do this, soil macro fauna diversity (soil animals with a size of >2 mm) and soil biological and chemical parameters were studied:

- Soil macrofauna samples for identification (600 samples)
- Soil samples for chemical analysis (100)
- Soil samples for biological analysis (200)

All the results obtained are being prepared for printing and will be included in the database.

The analyses which aim to qualify the impact of plant covers practices (DMC: direct seeding in mulch cropping systems)) on the soil biological compartment, related on the study of the biodiversity of the soil macrofauna, on the soil chemical parameters and the activities of soil microflora physiological.

The study of macrofauna and microflora was made on agronomic and natural systems and 600 samples of soil macrofauna were made. For soil chemical analyses, 100 samples were taken and analyzes are in progress of same as the physiological analyzes (microbial physiology).

The analysis of the soil macrofauna shows in 2008 the same tendency as that observed in 2007 with regard to the various studied systems. Namely a stronger density when the soil is cultivated with plant covers, DMC (Figure 1).

In the system with monoculture of maize, in comparison with maize on ploughing (1042 ind.m^{-2}) we observe a significant increase of the total mean density as well as the total mean biomass of the soil macrofauna under maize with DMC F0 (no fertilization) with 1227 ind. m^{-2} and 2371 ind. m^{-2} under DMC F1. The biomasses of the macrofauna vary from 3,95 g. m^{-2} under ploughing to 18 and 24,56 g. m^{-2} respectively under maize on DMC F0 and maize on DMC F1 (Figure 2). It will be noted that when the earthworms are present, their own biomasses represent more than 50% of the total biomass. We observe also an increase in the diversity of the soil macrofauna (groups of soil macrofauna) which passes from 14 groups under maize in ploughing (on a total of 25 identified groups) to 20 in DMC F0 and 21 in DMC F1 (Figure 1, number on the histogram).

In the systems with rotation maize-bean the results are very clear under crop of bean in 2008 after a cycle of maize in 2007 (Figure) 1). We note a significant increase of the densities and the total mean biomasses when the bean is cultivated in DMC with or without fertilization and in comparison with the bean on ploughing (Figures 1, 2).

Always in the rotation maize-bean and under maize crop in 2008 (after bean in 2007), the results show a stronger density and total mean biomass under the systems on DMC (fertilized or not) in comparison with maize on ploughing. The values of density are lower under maize than those met under bean in the rotation.

For functional groups of soil macrofauna (species which by their lifecycle has an impact on the soil transformations), we observe that the densities are characterized mainly by termites and ants densities. And that more than 50% of the biomass is characterized by the biomass of earthworms when they are present in the systems. In the same way, we observe more densities of earthworms under DMC systems (Figure 1).

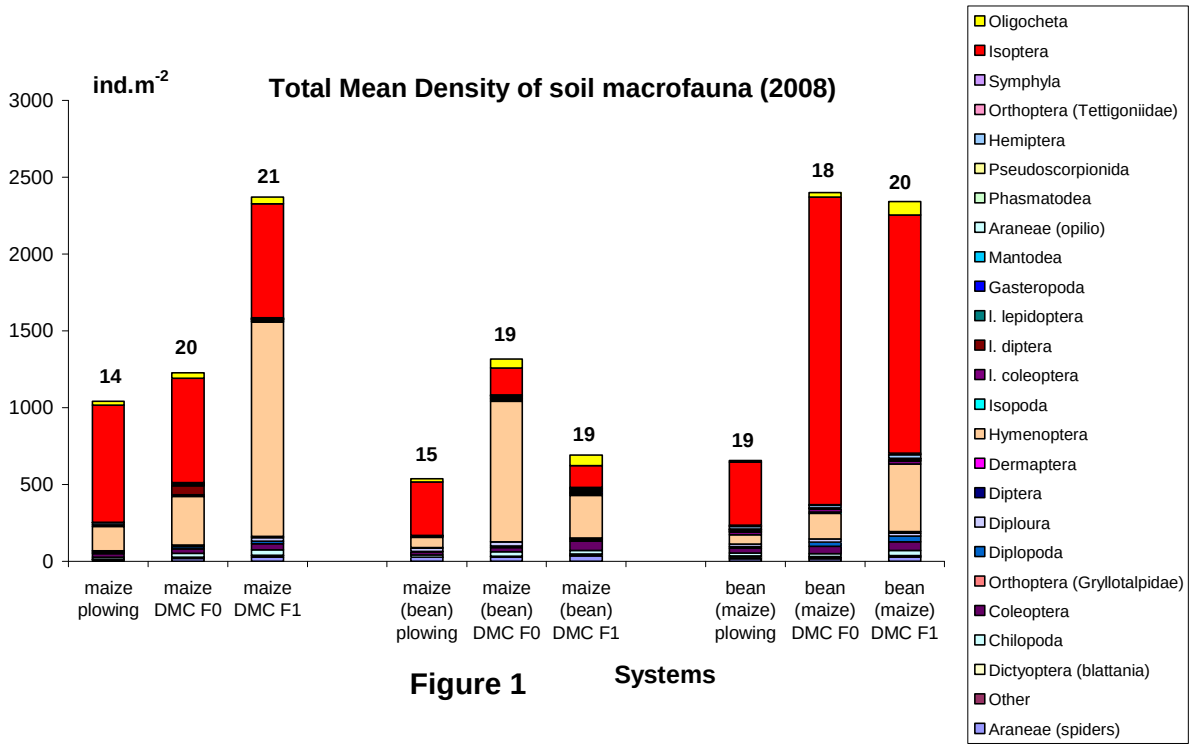


Figure 1

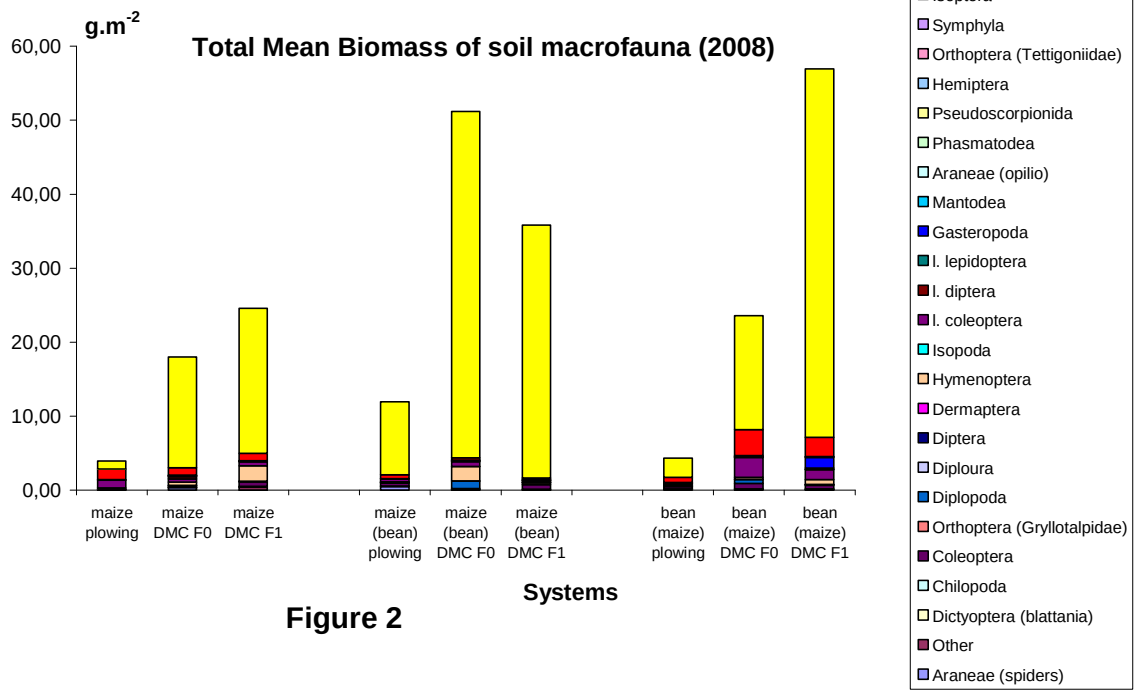


Figure 2

The resources used were as follows:

Personnel	Activity	Description	Number of units	
			Planned	Used
NAFRI (Software Developer)	2b	Demonstration plots	0	0
NAFRI (Technician)	2b	Demonstration plots	0	0
NAFRI (Technician)	2b	Demonstration plots	8	8
NAFRI (Trainer)	2b	Demonstration plots	8	8
NAFRI (Agronomist)	2b	Demonstration plots	40	40
Project Manager Applicant	2b	Demonstration plots	2	2
Cirad Senior Expert	2b	Demonstration plots	2	2
WU Senior Expert	2b	Demonstration plots	0	0
		TOTAL ACTIVITY 2b	**60**	**60**
NAFRI (Software Developer)	2c	Ecofriendly products	0	0
NAFRI (Technician)	2c	Ecofriendly products	4	4
NAFRI (Technician)	2c	Ecofriendly products	0	0
NAFRI (Trainer)	2c	Ecofriendly products	8	8
NAFRI (Agronomist)	2c	Ecofriendly products	15	15
Project Manager Applicant	2c	Ecofriendly products	9	9
Cirad Senior Expert	2c	Ecofriendly products	0	0
WU Senior Expert	2c	Ecofriendly products	0	0
		TOTAL ACTIVITY 2c	**36**	**36**
NAFRI (Software Developer)	2d	Information for Knowledge Base	0	0
NAFRI (Technician)	2d	Information for Knowledge Base	0	0
NAFRI (Technician)	2d	Information for Knowledge Base	8	8
NAFRI (Trainer)	2d	Information for Knowledge Base	4	4
NAFRI (Agronomist)	2d	Information for Knowledge Base	10	10
Project Manager Applicant	2d	Information for Knowledge Base	5	5
Cirad Senior Expert	2d	Information for Knowledge Base	0	0
WU Senior Expert	2d	Information for Knowledge Base	5	5
		TOTAL ACTIVITY 2d	**32**	**32**
	TOTAL ACTIVITY 2	NAFRI (Software Developer)	0	0
		NAFRI (Technician)	4	4
		NAFRI (Technician)	16	16
		NAFRI (Trainer)	20	20
		NAFRI (Agronomist)	65	65
		Project Manager Applicant	16	16
		Cirad Senior Expert	2	2
		WU Senior Expert	5	5
		TOTAL ACTIVITY 2	**128**	**128**

Equipment and supplies:

Travel Flights: 1 Asia - Asia

Running costs: 100 Soil analyses. Demonstration plots maintenance, space and running costs (NAFRI and contributions towards other projects).

II.4. Activity 3: Training of farmers and extension services

The aim of this activity is to support and reinforce the existing training organisations with a specific focus on conservation agriculture. The conservation agriculture techniques, specifically, those relating to direct sowing and cover crops are new and it is necessary to define new training modules for the promotion and extension of these eco-friendly cropping systems.

In the first year of the project, the training and public awareness activities concentrated on the preparation of multimedia documents and visits to the demonstration plots through the support of AFD and FFEM. In support of activity 2, all the training documents emerging from the different associated projects have been collected. These documents will be standardised using a common layout and supplemented by other training documents arising directly from the project in year 2.

The creation of multimedia support material started in this second year.
Initially the training will focus on the trainers from MAF and NAFES. Based on the feedback collected from the trainers, the improvements on the design and the organization of the content of the training modules on conservation agriculture were implemented. The improved versions were subjected to testing and feedback until a satisfactory response level is reached.
Practical training on specific topics was provided to the farmers and the staff of the extension services. Organised by NAFRI, as contributively to the action, technical training through demonstration plot units located on selected sites representing socio-economic and biophysical diversity, devoted to technicians, extension specialists, development agents and farmers. Systematic feed back was generated at the end of the training sessions so that the appropriateness of the knowledge base can be studied and thereby improve the knowledge base itself.
The objective of the visits was to create better awareness on environmental impacts of conventional agriculture (agricultural externalities) compared with eco-friendly cropping and farming systems (sensitization) targeted towards farmers, extension workers, Rural Development Project managers and policy makers.

As regards the visits, the objectives were not merely achieved but often exceeded. In fact, on the initiative of, and organised by the different associated projects, many visits and also training sessions were organised. In Xieng Khouang province for example, the following activities were organised by NAFRI/PRONAE together with its partner network.

Indicators of achievement

- Production of full-fledged training modules, leaflets, synthesis, and publication of key documents related to advantages of conservation agriculture and its impacts at local, regional national and international level,
- Contribution to building up and refining of Knowledge base and E-learning activities combined with the web site,
- New training modules on conservation techniques for different target groups,
- Sensitization of policy-makers, decision-makers both in agriculture, education, research and trade and development about the alternative techniques like DMC cropping systems.

Training and Fields visits for farmers:

Where	Nb pers.	From
B. khay	27	B. khay + Viengxay
B.Latbouak	48	B.Latbouak
B.Gnabsy	15	B.Gnabsy
B. Xoynafa	21	B. Xoynafa
B. khangpeug	22	B. khangpeug + Leng + Gnoy
B. Phouhoum	24	B. Phouhoum
B. my	25	B. my
B. Sisou	20	B. Sisou
B. Nammene	45	B. Nammene + Namkone Ngoi
B. Phakkae	38	B. Phakkae + B. HouyXouang
B. Phaklak	40	B. Phaklak + B. Nongxang
B. Khangpanieng	24	B. Khangpanieng
B. Nafay	20	B. Nafay + B.houat+B. Pienchanh
B. Nalong	62	B. Nalong + Nafay+Namune
B.Xay	48	B.Xay + Nadou + Kokhay
B.Leng	53	B.Leng + Le + Nong may
B. Nammene	50	B. Nammene
B. HouyXouang	40	B. HouyXouang
B. Khangpanieng	56	B. Khangpanieng
B. Phakkae	48	B. Phakkae
B. Phaklak	26	B. Phaklak
B.Keopatou	31	B.Keopatou
B. Nafay	12	B. Nafay
B.Leng	41	B.Leng
B. Nalong	45	B. Nalong
B.Nadou	118	Nadou + Kokhay
B. Xay	32	B. Xay
B. Sonmone	40	B. Sonmone
B.Youlieng	30	B.Youlieng
B. Hout	54	B. Hout
B. Pienchanh	65	B. Pienchanh
	1220	

Training:

Targets	Topics	Nb pers	Nb days	Nb h.d
Farmers	Cattle fattening 2006-2007	202	4	202
	SCV for corn production	330	4	330
	Use of pesticides	688	8	688
	Agricultural mechanization training	52	1	52
Extension workers	Sensitizing with Agro ecology (DAFEO and PAFEO)	60	7	205
Extension workers	Technical long term training SCV	22	3 à 8 mois	-
Students	6 topics	8	8 mois	-
Technical teams	Continuous training	2	300 H	86
	English learning	5	54 H	54
				1617

*m/d: man/day

Resources used

Personnel	Activity	Description	Number of units	
			Planned	Used
NAFRI (Software Developer)	3a	Prepare documents	0	0
NAFRI (Technician)	3a	Prepare documents	50	50
NAFRI (Technician)	3a	Prepare documents	0	0
NAFRI (Trainer)	3a	Prepare documents	8	8
NAFRI (Agronomist)	3a	Prepare documents	4	4
Project Manager Applicant	3a	Prepare documents	0	0
Cirad Senior Expert	3a	Prepare documents	0	0
WU Senior Expert	3a	Prepare documents	0	0
		TOTAL ACTIVITY 3a	**62**	**62**
NAFRI (Software Developer)	3b	Training of trainers	5	5
NAFRI (Technician)	3b	Training of trainers	5	5
NAFRI (Technician)	3b	Training of trainers	5	5
NAFRI (Trainer)	3b	Training of trainers	40	40
NAFRI (Agronomist)	3b	Training of trainers	10	10
Project Manager Applicant	3b	Training of trainers	5	5
Cirad Senior Expert	3b	Training of trainers	5	5
WU Senior Expert	3b	Training of trainers	10	10
		TOTAL ACTIVITY 3b	**85**	**85**
NAFRI (Software Developer)	3c	Farmers Fields Schools	0	0
NAFRI (Technician)	3c	Farmers Fields Schools	5	5
NAFRI (Technician)	3c	Farmers Fields Schools	5	5
NAFRI (Trainer)	3c	Farmers Fields Schools	25	25
NAFRI (Agronomist)	3c	Farmers Fields Schools	5	5
Project Manager Applicant	3c	Farmers Fields Schools	5	5
Cirad Senior Expert	3c	Farmers Fields Schools	0	0

WU Senior Expert	3c	Farmers Fields Schools	5	5
		TOTAL ACTIVITY 3c	**50**	**50**
NAFRI (Software Developer)	3d	Fields visits	0	0
NAFRI (Technician)	3d	Fields visits	4	4
NAFRI (Technician)	3d	Fields visits	0	0
NAFRI (Trainer)	3d	Fields visits	8	8
NAFRI (Agronomist)	3d	Fields visits	4	4
Project Manager Applicant	3d	Fields visits	0	0
Cirad Senior Expert	3d	Fields visits	0	0
WU Senior Expert	3d	Fields visits	0	0
		TOTAL ACTIVITY 3d	**16**	**16**
TOTAL ACTIVITY 3		NAFRI (Software Developer)	5	5
		NAFRI (Technician)	64	64
		NAFRI (Technician)	10	10
		NAFRI (Trainer)	81	81
		NAFRI (Agronomist)	23	23
		Project Manager Applicant	10	10
		Cirad Senior Expert	5	5
		WU Senior Expert	15	15
		TOTAL ACTIVITY 3	**213**	**213**

IT equipment: Video and photographic equipment, Video projectors have been purchased.

Running costs: All publishing, editing and copies are planned for the third year. Training and field visit costs: NAFRI and other projects contribution.

II.5. Activity 4: Building up of the knowledge base

The aim of this activity is to build the knowledge base on conservation agriculture practices. This activity will draw upon activities 1, 2 and 3, namely bibliography, implementation of alternative techniques and the capacity building activities. This will result in a fine-tuned final version of the knowledge base in the form of CD-ROMs and a web version.

The knowledge base which contains information on various concepts and practices on conservation agricultural techniques appropriate was not yet launched on the website. The knowledge base also will present a compilation of trade facilitation agencies and Agricultural Fairs and Exhibitions in Lao PDR and in Europe.

The knowledge base launched with activity 1, will be well formulated from the results of the Activity 2, i.e. Implementation of Conservation techniques. This is forming the core of the knowledge base drawing lessons from field, from maintaining demonstration plots. This activity summarises various adaptations of techniques for different ecological contexts.
The knowledge base is going through a continuous process of refinement and enrichment with the implementation of Activity 3, i.e. Training of farmers and extension services. This is providing the necessary inputs to improve the quality and the nature of organisation of the knowledge base. The appropriateness of the knowledge base is strongly considered and implemented accordingly, with the help of the communication expert.

The knowledge base will be finalised with all the recommendations for conservation agricultural techniques towards the end of the action. The web version will be finalised and the CD-ROM version released.

Because of the delay in the starting timetable, the expert from Wageningen University (Dr. Rico Lie) made his support visit in the beginning of year 2 (mid-February to mid-March 2008).

Mission and Objective

The database has three missions: 1. to ***conserve information***, 2. to operate through providing a ***pool of educational material***, and, 3. to act as a ***promotional and advocacy tool***.

Therefore, the objective of the database is three-fold. First, it wants to conserve a knowledge base for the agricultural sector at large by presenting a selection of exemplary practices and related materials in conservation agriculture. The second objective is to operate as a pool of educational material to be used by extension service providers and educational institutions operating in the same domain. Third, it also wants the database to be of relevance as a promotional tool in the domain of (international) trade and as an advocacy tool in the domain of policy making (at different levels). Through building upon up-to-date, basic and concerned information it aims to be a promotional tool for traders and an advocacy tool for decision makers. As such it will emphasize issues of sustainability (environmental health, economic profitability and social and economic equity).

Specific Target Groups

There are three specific target groups of the database:

1. The first target group consists of extension officers and students in the field of conservation agriculture. The database aims to be of relevance at different levels of education. For general students in agriculture or related disciplines, an overview of basic information and general description of practices will be sufficient. For extension officers on the other hand it is important that the database not only provides an overview of basic information on exemplary practices, but also provides detailed technical information.
2. The second target group can be found in the commercial sector. The database aims to be used as a promotional tool for marketing purposes. This can also be done in combination with other material, like the films that are going to be produced on different aspects of conservation agriculture. Dissemination of the materials in Laos and the Sub-region of the Greater Mekong can be done in cooperation with the Department of Production and Trade Promotion at the Ministry of Industry and Commerce. The Press and Information Officer of the European Union in Laos also expressed his willingness to help in distributing the CD-Rom with the database.
3. The third target group is the national and international community of governmental and non-governmental organizations operating in the domain of agriculture or related domains. For this target group the database can be used as an advocacy tool. The consequences for the content and the functioning of the database are similar to the consequences for using the CD-Rom as a promotional tool in the commercial sector.

Content

The content of the database consists of two main areas and several sub-areas:

1. Exemplary Practices and Training Materials
2. Related Material
    a. Selected bibliographies in several fields of interest
    b. Selected set of links to relevant information on the internet
    c. Networking in conservation agriculture

1. Exemplary Practices and Training Materials

In order to be able to describe the exemplary practices, a set of dimensions for assessing the practices needs to be developed and adopted. Success stories describe practices that are socially acceptable, economically profitable and environmentally sound, and adhere the technical principles of conservation agriculture (permanent soil cover, minimal soil disturbance and crop rotations). However, the database will not only consist of best practices that score high on specific criteria, but will also feature practices that might score high on one dimension and score low on another dimension. This is the reason why the database consists of exemplary practices and not of best practices. The practices are taken from the specific situation in Lao PDR. This does not mean that it could not have any relevance to other countries and regions in the world, but transferring it to another context needs to be done with care.

The selection of the dimensions and the selection of the exemplary practices are guided by the following principles:

- The selection of the dimensions serves an inward looking function as well as an outward looking function. Inward means that the focus is on the quality of life of the farmers and appropriate extension services. Outward means that the focus is on the sector of trade and commerce, policy makers and governing bodies, and the academic and professional communities at large.
- Selection of the exemplary practices will be taken from experiences in the two provinces of Lao PDR; Xieng Khouang and Xarabury.
- The exemplary practices will be selected under the expertise of the staff of NAFRI (PRONAE).
- Exemplary practices will be described in a qualitative way (through descriptive stories). The stories will highlight aspects of the dimensions that are relevant and typical to the particular practice. No sub-criteria will be defined in advance as emphasis will be put on particular characterizing aspects of the selected practices. Each exemplary practice will be accompanied by a so-called 'Quadrangle'-visual, an image that visualizes the scores on the 3 inward looking dimensions (the Quality of Life, Environmental Sustainability, and, the Regulatory Environment and Service Provision) and the 1 outward looking dimension (Commercialization and Advocacy) (see Figure 1.).
- The exemplary practices will also be assessed in a more quantitative way by adding a score on a scale of five on the four dimensions.

The selected dimensions are the following:

- Quality of Life: This dimension is about the sensitivity that a practice has for the improvement of the quality of the life of the farmer and his or her livelihood. The Quality of

Life dimension adopts the Sustainable Livelihoods Approach (SLA) as developed by DFID. The quality of life equals a sustainable livelihood and can thus be seen as depending on the different identified capitals. For the purpose of assessing exemplary practices in conservation agriculture on the dimension of quality of life, we have adopted the following capitals as being of relevance: a.) the human capital; b.) the social capital; c.) the physical capital; d.) the natural capital, and e.) the financial capital.

- Human capital is defined by the OECD as "the knowledge, skills and competences and other attributes embodied in individuals that are relevant to economic activity". (OECD, 1998:9). It refers to the kinds and levels of education needed, to training demands and to required skills and technological knowledge. It also includes health and psychological well-being of the farmer.
- Social capital is the whole of social relations that are relevant in one way or the other for production purposes. "For the majority of writers it is defined in terms of networks, norms and trust, and the way these allow agents and institutions to be more effective in achieving common objectives" (Schuller). It refers to community issues and collective organizational requirements. Issues that are of interest here are for instance: sensitivity to labor inputs and availability of labor, sensitivity to gender (un)balances, and sensitivity to cultural embeddings. Social capital also includes cultural embedding and appropriateness. A new practice can for instance be a continuation of an existing practice or the change to the new practice can be too vast, and the gap between the traditional practice and the new practice can turn out to be too big.
- Physical capital consists of non-human assets that are made by humans and are required for or used in production activities, e.g. technical equipment. But besides technical equipment, physical capital also includes infra-structural capital, which refers to communication infrastructures, roads, irrigation dams and any physical improvements made to nature.
- Natural capital refers to water, land, air, plants, etc... This capital is about the potential that nature offers. It is commonly divided into renewable resources (agricultural crops, vegetation, wild life), and, non-renewable resources (fossil fuels and mineral deposits).
- "Financial capital denotes the financial resources that people use to achieve their livelihood objectives" (DFID,). It refers to the availability of cash or equivalents that people apply to improve their livelihood and their quality of life.
- The 5 capitals cover the human, inter-human (social), extra-human (man-made artifacts), and non-human (nature) aspects of the quality of life. It is not necessarily so that the larger the capital, the higher the quality of life is. However, it is envisaged that the quality of life is subject to the qualitative existence of these capitals, individually and in relation to each other. The description of the dimension of the 'quality of life' should therefore include reviews of the characteristics of these capitals and score the amount of sensitivity to these capitals – A high score on this dimension means that the practice has a positive influence on the improvement of the quality of life of the farmers and is thus sensitive to issues related to human, social, physical, and natural capital.

• Environmental Sustainability: This dimension is about maintaining the qualities that are valued in the natural environment on a long-term basis. To what extent does the practice sustain the environment and conserve agricultural diversity? To what extent are the

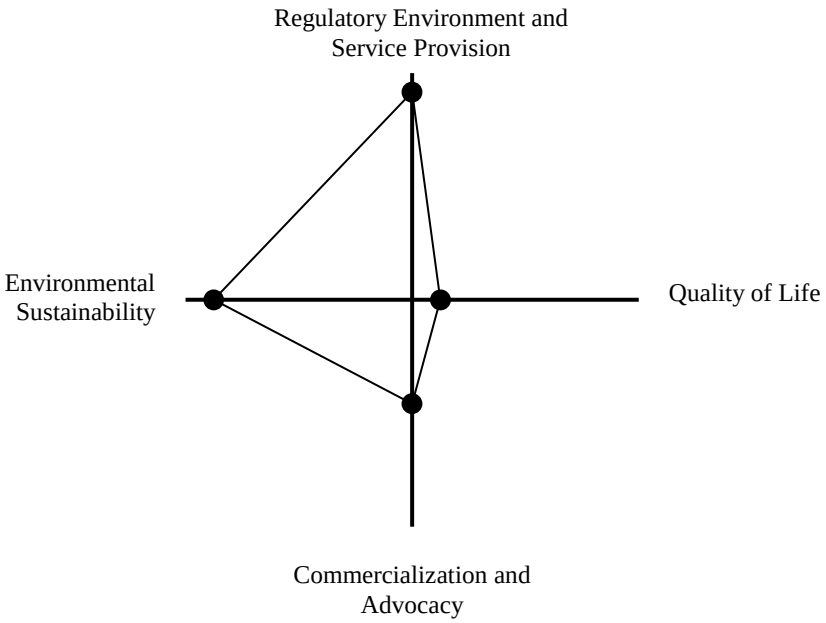
production techniques environmentally sound? To what extent does the practice have a positive result on the maintenance of biodiversity and the totality of the eco-system? To what extent does the practice promote the natural functioning of the eco-system? Good integrated management aims to maintain enough diversity to allow interesting eco-systemic properties to emerge. – A high score on this dimension means that the practice scores high on maintaining the natural eco-system and promoting the natural functioning of the eco-system.

- Regulatory Environment and Service Provision: This dimension is about the availability of a supportive political climate and regulatory environment. It also includes the availability of rural services; extension services and other support services. To what extent is the political and regulatory environment supportive to the practice? Is the practice appropriate and does it fit into the existing environment? Issues of concern are for instance: the political environment; regulation; market access; taxes; the financial context; credit provision; reasonable pricing; effective extension support; facilitating marketing…)? Does the government enable a positive environment? – A high score on this dimension means that the regulatory environment is supportive towards the practice and that rural services are appropriate and in place.

- Commercialization and Advocacy: This dimension is of a different nature than the three dimensions identified earlier. It measures the potential that a practice has for trade and advocacy. It captures the 'market outlook' of a practice by identifying characteristics of the practice that have high marketing potential, and thus high economic potential. These characteristics can come out of the above mentioned three dimensions, a combination of these three dimensions, or from a totally different field of operation of the practice. A practice could for instance perfectly fit into the discussion on the establishment of a new 'good for development'-label , or it could nicely fit within existing trade relations… – A high score on this dimension means that the practice has (a) characteristic(s) that ha(s)ve high potential for use in (social) marketing.

Below you will find an example of how the scores on the different dimensions can be visualized in a quadrangle.

Fig 1. Example of a Quadrangle



In this example the selected practice scores high on the dimensions of environmental sustainability and the regulatory environment is supportive towards the practice. Moreover, the service provision to the practice is appropriate and in place. However, the particular practice scores low on the dimension of improving the quality of life for the farmers. This could mean for instance that the practice requires labor that is too hard for the farmers (human capital) or that the community is not ready to adopt the practice (social capital).

Training Materials

The database will include a listing and descriptions of the training materials linked to the exemplary practices. The goal is to have most training material available in 3 languages: Lao, French and English. Currently, most material is available in Lao and French, not in English.

2. Related Materials

2a. Bibliographies

The bibliographies are in development. They cover the following (sub)areas:

- Conservation Agriculture
- Communication, Education and Trade
    - Communication, Innovation and Development
    - Extension, Training of Farmers and Farmer Field Schools (FFS)
    - ICTs (incl. open source) and (Agricultural) Development
    - Trade

2b. Relevant information on the internet

The idea is not to have as much links as possible to relevant information on conservation agriculture to be found on the internet, but to have a selected list of quality, trusted and sustainable resources.

2c. Networking

The database will also include basic information on organizations working in the area of conservation agriculture and provide information on main conferences and other meetings. Examples are: the Southern Conservation Agricultural Systems Conference (SCASC) (http://www.ag.auburn.edu/auxiliary/nsdl/scasc/); World Congresses on Conversation Agriculture (see for the 3rd congress: http://www.act.org.zw/congress/index.htm); Latin American Network of Conservation Tillage (RELACO) (http://www.fao.org/ag/ags/AGSE/6to/relaco/sld001.htm); The Conservation Technology Information Center (CTIC) (http://www.conservationinformation.org/?action=about)…

More details in the Annexe 2 about:

- Entering the Database,
- Sustainability of the Database,
- Going for an Internationally Certified Database
- Going for Open Source,
- Going for a Strategic Location of the On-Line Database,
- Going for a CD-Rom,
- Examples of Database Entries,
- And Database Form.

Resources used

Personnel	Activity	Description	Number of units	
			Planned	Used
NAFRI (Software Developer)	4a	Initial Knowledge Base	5	5
NAFRI (Technician)	4a	Initial Knowledge Base	80	80
NAFRI (Technician)	4a	Initial Knowledge Base	50	50
NAFRI (Trainer)	4a	Initial Knowledge Base	0	0
NAFRI (Agronomist)	4a	Initial Knowledge Base	5	5
Project Manager Applicant	4a	Initial Knowledge Base	0	0
Cirad Senior Expert	4a	Initial Knowledge Base	0	0
WU Senior Expert	4a	Initial Knowledge Base	0	0
		TOTAL ACTIVITY 4a	**140**	**140**
NAFRI (Software Developer)	4b	Building Knowledge Base	20	15
NAFRI (Technician)	4b	Building Knowledge Base	75	75
NAFRI (Technician)	4b	Building Knowledge Base	50	50
NAFRI (Trainer)	4b	Building Knowledge Base	8	8
NAFRI (Agronomist)	4b	Building Knowledge Base	8	8
Project Manager Applicant	4b	Building Knowledge Base	5	5
Cirad Senior Expert	4b	Building Knowledge Base	5	5
WU Senior Expert	4b	Building Knowledge Base	0	0
		TOTAL ACTIVITY 4b	**171**	**166**
NAFRI (Software Developer)	4c	Enriching Knowledge Base	15	10
NAFRI (Technician)	4c	Enriching Knowledge Base	50	50
NAFRI (Technician)	4c	Enriching Knowledge Base	50	50
NAFRI (Trainer)	4c	Enriching Knowledge Base	10	10
NAFRI (Agronomist)	4c	Enriching Knowledge Base	10	10

Project Manager Applicant	4c	Enriching Knowledge Base	0	0
Cirad Senior Expert	4c	Enriching Knowledge Base	0	0
WU Senior Expert	4c	Enriching Knowledge Base	5	5
		TOTAL ACTIVITY 4c	**140**	**135**
NAFRI (Software Developer)	4d	Final Release	10	0
NAFRI (Technician)	4d	Final Release	52	0
NAFRI (Technician)	4d	Final Release	39	0
NAFRI (Trainer)	4d	Final Release	0	0
NAFRI (Agronomist)	4d	Final Release	0	0
Project Manager Applicant	4d	Final Release	0	0
Cirad Senior Expert	4d	Final Release	0	0
WU Senior Expert	4d	Final Release	0	0
		TOTAL ACTIVITY 4d	**101**	**0**
TOTAL ACTIVITY 4		NAFRI (Software Developer)	50	30
		NAFRI (Technician)	257	205
		NAFRI (Technician)	189	150
		NAFRI (Trainer)	18	18
		NAFRI (Agronomist)	23	23
		Project Manager Applicant	5	5
		Cirad Senior Expert	5	5
		WU Senior Expert	5	5
		TOTAL ACTIVITY 4	**552**	**441**

IT equipment: Video and photographic equipment, Video projectors have been purchased.

Running costs: All publishing, editing and copies are planned for the third year. Training and field visit costs: NAFRI and other projects contribution.

Travel Flights: 1 Europe-Asia

II.6. Activity 5: Communication and Dissemination Activity

The aim of this activity is to create effective communication networks between the various stakeholders involved. This activity will progress in parallel with other activities to attain the maximum visibility and to create awareness of the trade potential for agro-based SMEs.

The activity is focused on preparing various publicity materials: 1) on the advantages of the conservation techniques over conventional practices, addressed mainly towards the farming communities and extension services and 2) on the potential for trade in eco-friendly agricultural products for the international market, addressed towards the intermediary business organisations and the SMEs. A sound communication strategy will be adopted with the help of the communication expert of the project, who will ensure that the materials are appropriately and effectively designed for the target groups throughout the project.
Because of the delayed timetable, the “Trade Potential” seminar initially planned the first year was organized in the second year of the project, in October 2008. It was organised in Lao PDR to communicate and create awareness about the potential for international trade in eco-friendly agricultural products. It covered the importance of conservation agriculture in sustainable production for the improvement of rural livelihoods and poverty alleviation. All the existing and potential SMEs and the trade facilitation agencies, policy makers participle in the

activity. This trade seminar was organized at the time that the first agricultural fair bases on Conservation Agriculture. More than 10 000 persons assisted.

Fair activities	Implied partners		Detail activities
1 - Animal component			
Fair with the animals (bovine, porcine, caprine, poultries)	40	> 30 Private (independent stockbreeders), 3 projects (NOT, PRONAE, PROSA), 8 public institutes (Center of breeding of NAFRI-Nam Souang, Closes bovines of the PAFO Xkg, 6 DAFEOs province)	Purchase/sale of animals, product sales veterinary, demonstration of alternative techniques of breeding
2 - Agricultural inputs		**PRONAE**	
Farm equipment	3	2 private (tradesmen of Phonsavanh) + 1 project (PRONAE)	Sale of material (cultivator, trailer, mills, pump, débrouissalleuse)
Agricultural inputs	1	1 private (tradesman of Phonsavanh)	Animal food and care, manure, seeds etc
Seeds	8	6 Rural organizations (Union of the women of 6 districts), 1 project (PRONAE), 1 institute (NAFRI-Nam souang)	Seeds of rice and seeds fodder
Pisciculture	1	1 project (SDC/PAFO)	Sale of fish, frogs
Seedbeds trees	2	PAFO + DAFO Khoun	various species
Demonstration of farm equipment	1	project PRONAE	Seeders (7), roller (1), spreader (1), canes planting machines
3 - Agrobiodiversity			
Watery resources	6	6 Unions of the women of 6 districts	
Medicinal products and NTFPs	7	6 Unions of the women of 6 districts + 1 private (trading Phonsavanh)	
Rice aerobics tasting	1	PRONAE	tasting as a blind man of a 10aine of varieties with like witness the CLS
Local culinary preparations	6	6 Unions of the women of 6 districts	
Local products (fruits and lég)	6	6 Unions of the women of 6 districts	
4 - Craft industry			
Silk	7	6 Unions of the women of 6 districts + 1 private (company sérisiculture Phonsavanh)	Demonstration of spinning, weaving and end products
Instruments wood, osier, bamboo	6	Private individuals via the 6 DAFEOs	any other business (intruments agricultural etc)
Sunshades and carved wood	2	2 tradesmen of Phonsavanh	
Traditional fabrics and clothing	6	Private individuals via the 6 Unions of the women	

5 - Agricultural processing industry			
Renewable energies	3	1 project (Biogas), 1 Institute (TO READ) and 1 company (Sunlabob)	
Food process	2	2 private (Lao farmer Product, Sao Round of applause)	
6 - Projects, organizations			
Projects	5	PRONAE, NOT, PROSA, PEIG, BIOGAS	
Insitutions main roads	4	NAFRI (various centers), NAFES, LIRA, Office provincial Tourism	
International organizations	4	World Bank, UNESCO, CIAT, SDC	
7 - Animations			
Dance and music	10	8 companies groups of dancers and musicians	
Fights bovines	20	> 20 owners of fighting bulls	
Contest plays of spinning top trad		PAFO/Dpt sport	
8 - Others			
Telephony	2	2 private (Mr.-phon, LTE)	
Restaurants	8	8 restorers	
Clothing	8	8 sites rented with the private ones	
TOTAL	**169**		

Resources used

Personnel	Activity	Description	Number of units	
			Planned	Used
NAFRI (Software Developer)	5a	Dissemination materials	5	5
NAFRI (Technician)	5a	Dissemination materials	10	10
NAFRI (Technician)	5a	Dissemination materials	10	10
NAFRI (Trainer)	5a	Dissemination materials	5	5
NAFRI (Agronomist)	5a	Dissemination materials	5	5
Project Manager Applicant	5a	Dissemination materials	0	0
Cirad Senior Expert	5a	Dissemination materials	0	0
WU Senior Expert	5a	Dissemination materials	0	0
		TOTAL ACTIVITY 5a	**35**	**35**
NAFRI (Software Developer)	5b	Trade seminar - Laos	5	5
NAFRI (Technician)	5b	Trade seminar - Laos	5	5
NAFRI (Technician)	5b	Trade seminar - Laos	5	5
NAFRI (Trainer)	5b	Trade seminar - Laos	5	5
NAFRI (Agronomist)	5b	Trade seminar - Laos	5	5
Project Manager Applicant	5b	Trade seminar - Laos	5	5
Cirad Senior Expert	5b	Trade seminar - Laos	5	5
WU Senior Expert	5b	Trade seminar - Laos	5	5

	TOTAL ACTIVITY 5b	**40**	**40**
TOTAL ACTIVITY 5	NAFRI (Software Developer)	10	10
	NAFRI (Technician)	15	15
	NAFRI (Technician)	15	15
	NAFRI (Trainer)	10	10
	NAFRI (Agronomist)	10	10
	Project Managr Appelicant	5	5
	Cirad Senior Expert	5	5
	WU Senior Expert	5	5
	TOTAL ACTIVITY 5	**75**	**75**

IT equipment: Video and photographic equipment, Video projectors have been purchased.

Running costs: + NAFRI and others projects contribution.

Travel Flights: 1 Europe-Asia

1 Asia-Asia

pm: NAFRI and others projects contribution

II.7. Position according to the Work Plan and the Framework Plan

Revised Action Plan

Year 1 Activities	Semester 1						Semester 2						Observations
	1	2	3	4	5	6	7	8	9	10	11	12	
1a – Open the project website													Deferred to year 3
1b – Open the project e-forum													Cancelled
2b – Establishing demonstration plots													
2c – Verifying eco-friendly products (soil quality)													
2d – Finalise recommendations for the knowledge base													
3a – Prepare multimedia documents													Deferred and Continue in year 3
3b – Training of trainers													
3c – Farmers and Extension workers fields schools													
3d – Fields visits													
4a – Initial knowledge base on various concepts and practices													Deferred 6 months
4b – Building the core of the knowledge base													Deferred 6 months
4c – Enriching the knowledge base													Deferred to year 3
4d – Final release													Deferred to year 3
5a – Preparation of dissemination materials													
5b – Organisation of Trade Potential Seminar in Lao PDR													Deferred to semester 2

According to the Framework

Year 2 Activities	Expected results	Indicators	Observations
ACTIVITY 1: Project launch, preparation of a website and selection of field areas	**1a** -Open the project website: A project website is linked to knowledge base on-line	* Operational website and e-forum * Frequents visits/hits * Number of contributors	Delay
	1b - Open the project e-forum: An e-forum is linked to the website		According to the EU, NAFRI, WU and CIRAD, this activity was conceled.
ACTIVITY 2: Implementation of conservation techniques	**2b -** Establishing demonstration plots	* 2 Provinces * 3 districts/Province * 30 farmers/district * 6 demonstration plots * 100 soils analyses * 10 cropping systems/Province	Completed on more sites than planned
	2c - Verifying eco-friendly products (soil quality)		Completed in Sayaboury Province
	2d - Finalise recommendations for the knowledge base		Started but not finished
ACTIVITY 3: Training of farmers and extension services	**3a -** Prepare multimedia documents	* Availability and diversity of the materials on both soft and hard formats * 1 long term (6 months) practical session in each province * 3 short term (8 days) training sessions in each province * 5 NAFRI Staff (ToT)/District trained * 10 extension workers/District * 200 fields visits	Started
	3b - Training of Trainers		Completed (more than planned)
	3c - Farmers and Extension workers fields school		Completed (more than planned)
	3d - Fields visits		Completed (more than planned)

ACTIVITY 4: Building up of the knowledge base	**4a -** Initial knowledge base on various concepts and practices	* Availability and diversity of the materials on both soft and hard formats * Number of cropping systems with conservation agriculture techniques well described according to the socio-economic and biophysical context, environmental impact and their conditions of adoption by the farmers and their conditions of extension	Started
	4b - Building of the core of the knowledge base		Started
	4c - Enriching the knowledge base		Started
	4d - Final release		Not yet
ACTIVITY 5: Communication and Dissemination Activity	**5a -** Preparation of dissemination materials	* 500 copies of all modules products distributed * 1000 copies of cd-rom distributed * Numbers of participants in the Trade Seminar in Lao PDR	Started
	5b - Organisation of Trade Potential Seminar in Lao PDR		Held in October 2008. National, regional (South East Asia) and international agricultural fair.

Human resources

Personnel in Year 1	Planned	Used	Observations
Project Manager Applicant	36	36	
CIRAD Senior Expert	17	17	
WU Senior Expert	30	30	
NAFRI (Software Developer)	75	45	Delay for the Knowledge base building
NAFRI (Technician)	350	298	
NAFRI (Technician)	240	201	
NAFRI (Trainer)	129	129	
NAFRI (Agronomist)	121	121	
Total	998	877	

III. Partnership

Level of involvement of each partner in the action

CIRAD, France (Applicant)

The CIRAD (Centre de Coopération Internationale en Recherche Agronomique pour le Développement), is the French specialist in development-oriented agricultural research for tropical regions. The CIRAD agro-ecology team will be responsible for coordinating the whole action by bringing together the various aspects, such as the designing of conservation techniques, implementation in the field, and harmonising the progress in the field with training and development of the knowledge base. CIRAD, with its extensive expertise in conservation agriculture, supported by its long experience in the South East Asian region, will prove to be a valuable leader for the project. CIRAD will take primary responsibility for implementing the action, from coordinating with partners, local agencies, organising field trips, capacity building activities, building the knowledge base and finalising the end products.

National Agriculture and Forestry Research Institute, Lao PDR (Partner)

The NAFRI, Lao PDR, has been at the forefront of research into the production and propagation of cereal crops; the collection, evaluation and conservation of indigenous genetic resources; and research into cultivation techniques for crops, cropping patterns and agricultural production systems. The partner will be responsible for the activities related to the collection and compilation of data, and contribute to the establishment of the knowledge base of the project. The partner will also be responsible for organising the training of trainers with the Ministry of Agriculture and Forestry and the National Agriculture and Forestry Extension Service. The training sessions will generate feedback which will enrich the quality of the knowledge base. It is significant to note that NAFRI acts as an “in-service training and continuing education” agency.

Sub-department Communication Science (CIS) – University of Wageningen (Partner)

The Research Group of Communication and Innovation Studies (CIS) comes in as a valuable partner in reflecting, guiding and advising on the training modules for the farmers and

extension services of the Lao PDR. The expert from CIS will be responsible for academic teaching of communication strategies and for capacity building activities. Furthermore, CIS will handle the management of mechanisms for generating feedback from the training sessions. CIS' involvement is motivated by learning about how technical agricultural knowledge bases (with conservation agriculture in Laos as a case study), through the use of ICT, could be used in informal and formal extension and other agricultural education. In coordination with NAFRI and CIRAD, CIS will contribute to the organisation of the training sessions for farmers and extension service and will play a major role in enriching and finalising the training modules in the most appropriate forms.

Main role of each partner in implementing the activities described

Activities	Tasks	Implementing partners
ACTIVITY 1: Project launch, preparation of a website and selection of field areas	**1a** -Open the project website:	NAFRI
	1b - Open the project e-forum:	NAFRI
ACTIVITY 2: Implementation of conservation techniques	**2b -** Establishing demonstration plots:	NAFRI + CIRAD
	2c - Verifying eco-friendly products (soil quality):	NAFRI + CIRAD
	2d - Finalise recommendations for the knowledge base:	NAFRI + CIRAD + WU
ACTIVITY 3: Training of farmers and extension services	**3a -** Prepare multimedia documents:	NAFRI + CIRAD
	3b - Training of Trainers	NAFRI + CIRAD + WU
	3c - Farmers and Extension workers fields school	NAFRI + CIRAD + WU
	3d - Fields visits:	NAFRI + CIRAD
ACTIVITY 4: Building up of the knowledge base	**4a -** Initial knowledge base on various concepts and practices:	NAFRI + CIRAD
	4b - Building of the core of the knowledge base:	NAFRI + CIRA
	4c - Enriching the knowledge base:	NAFRI + WU
	4d - Final release	NAFRI + WU
ACTIVITY 5: Communication and	**5a -** Preparation of dissemination materials:	NAFRI

Dissemination Activity	**5b -** Organisation of Trade Potential Seminar in Lao PDR:	NAFRI + CIRAD

The strength of the partnership involved in the project is linked to the strong political will to publicise agro-ecological techniques to promote conservation agriculture, taking into account the preservation of natural resources. This desire had already been expressed in 2005 by:

- the circular of the Council of Ministers (554/ccm.dc of 21/04/2005),
- the ministerial order of the Ministry of Agriculture and Forestry (0372/df.05 of 11 May 2005).

This desire is currently illustrated by the request of the MAF to include agro-ecology as a basic principle in the creation of centres for training-demonstration-service provision which are already being opened within village development clusters (Kum Ban Pattana).

The MAF aims to create 330 of these centres by 2010. NAFRI, an institute of the MAF and official partner to the project, is directly involved in this initiative and has invested heavily in it. The same can be said for the different MAF projects in the agriculture and conservation domains, namely PROSA, PRONAE and PASS. It is thanks to these different projects that we have been able to receive technical and financial support for setting up field activities.

The weak feature of the partnership was due to the ministerial reorganisation which took place during the first half-year of 2007. It did not alter the MAF priorities but the slippage in the timetable which resulted caused us to review the Action Plan of the project. This readjustment has not harmed the project. It was just a matter of changing the priorities in the first year, which were diverted to fieldwork. This reorganisation enabled us to exceed the objectives in terms of the number of demonstration plots laid out and field visits made by farmers, extension workers, policy-makers and rural development projects. The work of setting up the website and discussion forum and constructing the database should proceed rapidly at the beginning of the second year of the project.

Although the links at the local level (villages and districts) with the commercial sector are extensive, it is still necessary to improve linkages at the centre. It is especially necessary to improve inter-ministerial communication between the Ministry of Industry and Commerce (MoIC) and MAF.

IV. Methodology and effectiveness

To achieve the objectives, a systematic approach has been used, the aim of which is the progressive transfer of competence to farmers, local authorities, development agencies and private operators. It is based on three principles:

- To develop a generalised iterative approach to respond to the need for regular feed-back from everybody involved in the project so as to validate and adapt in “real time” the supply of technology, methodology and organisation in accordance with the changing biophysical, socio-economic and political context, and in accordance with the demand. Regular evaluation at every stage should make it possible to adapt the activities in real time, to re-orientate the programme and thus to optimise all the resources.
- To develop an integrative approach, bringing together research, extension, training and all the processes of environmental structuring and political and financial decision-making from the start of the project and throughout its life. It is a case of bringing together all those involved in rural development: farmers, extension workers,

researchers, the private and banking sector, political leaders and financiers. This is an integrative iterative process, driven by components centred on diagnosis, creation/demonstration, training, monitoring/evaluation, environmental structuring and publicity. Each participant is therefore more or less involved in each of the project activities, and this involvement of each of them is essential to the success of this global systematic approach.

- Modern information and communication technologies offer the promise of transforming the way trade-related services are offered and how these customised applications affect the quality of services and create new opportunities for commerce. In the area of conservation agriculture, a lot depends on the way these techniques are adopted, and on long term sustainability and market linkages. To make this kind of tool available at the institutional level for a country like Lao PDR, should not depend on high-technology products, but rather on robust, user-friendly, cheap or free information technologies.

Agronomy and Conservation Agriculture

Conservation Agriculture techniques are the foundation of this project. A number of areas have been selected to represent the diverse conditions of Lao PDR. This process of adopting and implementing conservation agriculture techniques involves learning about the environment and current practices, prioritizing development issues, proposing technical alternatives, choosing demonstration plots, collaboratively designing experiments, obtaining feedback on techno-social and economic validation of the designs. This method of implementing new and alternative conservation techniques will evolve over the period of the project and will form the core of the knowledge base.

Extensive field trips are organised to liaise with farmer groups and to implement various techniques such as the DMC (Direct Seeding – Mulch based Cropping systems). The viability and success rate of the adaptation of these techniques will be carefully analysed and compared with other cropping systems. The results of the design work will be fed into the extension services via the training programmes. Recommendations resulting from the implementations will be incorporated into the knowledge base.

Conservation Agriculture involves:

- Initial agro-economic assessment: and social diagnosis of farming systems, human and physical environments, provides a basis for generating technologies adapted to smallholders' strategies and environmental conditions
- Setting up medium-term demonstration plot units where conventional systems are continuously compared with DMC systems based on available technologies and innovative DMC systems based on new technologies and inputs
- Adaptation and validation by smallholders of DMC systems and simple technologies
- On-farm implementation with farmer groups: agro-economic evaluation for labour requirement, production costs, yields, net income and labour productivity
- Community-based approach which focuses on the adoption of technologies at village level, taking into account collective land management
- Ongoing training for smallholders, extension agents and information provision to policy makers
- Follow-up and analysis of the conditions of extension and adoption by farmers

As this process demonstrates, the knowledge base will systematically integrate the processes that are involved in implementing alternative conservation agriculture practices, with experience and the know-how at the core. The knowledge base will be addressed towards the farmers, extension services and the trade facilitation agencies.

The training sessions for the farmers and extension workers are essential to promote the application of conservation techniques reflecting on the trade and development sector and on the implementation activities of the government bodies. This will also help generate valuable feedback on

- the satisfaction of the end-user with the design and presentation of the knowledge base
- the quality and the comprehensive nature of the scientific data provided
- the relevance of the information provided to the original requirements

Feedback generated at the end of training sessions will allow for the constant improvement of both the presentation and the scientific content of the knowledge base. This will ensure that the information flow is streamlined and will meet the needs of the defined target groups in all respects.

Capacity Building Activities - Training and Feedback

Cropping systems can be regularly improved via the "innovation-extension" approach, while meeting the requirements of farmers on the one hand and the market demands on the other. Regular training sessions will be held for the farmers and extension workers. Feedback from these sessions will help improve the content and the organisation of the knowledge base.

The choice of Open Source Software is very important since it will reduce the cost of ownership and also the applications running on it. There is a wide choice of readily available free applications which can be customised to suit requirements, whereas proprietary software is expensive and does not offer the flexibility of customisation to the local requirements

Dissemination Seminars

Dissemination seminars will be conducted in Europe and Asia to make the business communities of the respective regions more aware of the investment opportunities in eco-friendly agricultural trade. Project outputs, such as CD-Roms, the online knowledge base and brochures, will be publicised and demonstrated.

V. Conclusion

Summary of Conclusions of monitoring report (October 2008)

- **Relevance and Quality Design**

The ORCATAD project aims at enhancing the export capabilities of Lao PDR in eco-friendly cash crops, which is highly relevant to the Lao PDR as a whole and to the identified project beneficiaries in particular.
The project is well designed to meet the objectives of Asia Invest II Programme. The combination of the two PPs: (1) to increase the practice of conservation agricultural technologies, and (2) reinforcing institutional capabilities of business intermediates and relevant SMEs with a view of niche market development for selected products from Laos, was well justified at the stage of the project design. However, neither activities, as per the

logical framework of the project, nor the OVIs at the level of the project results and purposes logically correspond and will eventually lead to the achievement of the PP2. The project design hierarchy serves only the achievement of PP1. This imbalance has not yet been addressed and/or adjusted by the project and, consequently, is mostly not reflected in the project implementation. Project inputs/activities, results and OVIs at the level of project results and the PPs are relevant to the PP1 only. Some assumptions address the involvement of SMEs and business intermediaries, but this is not enough for niche Lao products and business opportunities development. The present status of the project logframe reflects the needs identified at the stage of the project design related to improved agricultural technologies and the integration of Laos in the international information society. The needs are relevant to the whole action of the project (OO), which suppose to enhance the export capabilities of Lao PDR in eco-friendly cash crops are not yet adequately addressed. The same concerns the project aim to build further and strengthen on the existing relationships between European and Asian partners through the organic exchange of know-how in the areas of conservation agriculture, communication and trade and development. This is generally understood by the project partners and further adjustments have to be made in order to achieve both project purposes (PPs). The adjustment of the lograme to both PPs will make the project design more consistent with the original design and increase the ability to achieve the OO of the project.

- **Efficiency of Implementation to date.**

To date the project is well advanced in implementing activities related to conservation agriculture. The project had a late start: although the contract was signed on 7 December 2006, the official start date is considered as 1 February and the launch workshop took place in September 2007. As per initial work plan, a number of activities are being delayed: launching workshop took place 7 month later than planned, and the website development is still underway (activity 1). Organization of trade potential seminar in Laos is not yet scheduled (activity 5). On the contrary, some activities started earlier. This mainly concerns the establishment of demonstration plots in cooperation with other donor projects, field visits and soil analyses.

Project partners are working on the development of the separate project website which will have a link to the conservation agriculture database. After the project end, the website has to be maintained by the National Agriculture and Forestry Research Institute (NAFRI), the project partner. An option of integration of ORCATAD project information with database to the existing NAFRI website is being considered.

The majority of project activities are being implemented in collaboration with other projects working in the same or similar fields, mainly funded by AFD and other French bi-lateral programmes.

There is a need to facilitate project activities in capacity building of local business intermediaries and SMEs involved in trade. Activities to attract relevant EU companies interested in buying selected niche products from Laos have to be reinforced. Another option for new activities to be incorporated in the project is the development of fair trade schemes.

The current status of achievements can be summarised as follows: Result 1 is underway in terms of building the knowledge base itself, but not yet available through the internet. This is caused by the delay in the website development (85% completed, as reported by the project partners) and absence of a final decision on how to proceed with the website further (finalise the separate ORCATAD project website or incorporate it in the existing NAFRI website). Result 2 is well underway. A good indicator of achievement and of the quality of services delivered is the emerging interest and willingness of farmers not directly involved in pilot project areas to follow conservation agriculture technologies. Result 3 is behind schedule

with only rare contacts with business operators being made and some regional events organised. As reported above, this result has to be reconsidered in the logframe to make it more concrete and practically-oriented in order to achieve PP2 and meet the requirements and priorities of the Asia Invest Programme. No OVIs can be found in the lograme to assess the achievement of this project result.

- **Effectiveness to date.**

The first group of beneficiaries (farmers and extension services at the provincial and district levels) is benefiting from the project through training and capacity building in cultivation techniques, and currently uses the introduced conservation agricultural technologies. Demonstration fields serve as a good practical example to follow. The second group of beneficiaries/target groups (Agro-based SMEs and business intermediates involved in trade and export operations) are not benefiting yet because of the low attention paid by the project to trade and business-related activities, the non-sufficient logic of intervention in this field and lack of expertise of all project partners involved in business and trade-related activities. Some actions have been undertaken (two small-scale seminars for traders at provincial level, meetings with some business operators in agriculture), but it is still too early to say that this group of beneficiaries is benefiting from project services provided and its results. It is too early to observe the benefits from using IT&C technologies and the website with access to knowledge base, but in any case the users of e-resources will differ from those involved in agriculture directly.
External conditions and, particularly, the legal environment for PP1 is favourable for the project, which is reflected in the assumptions of the project logframe. PP2 does not have any assumptions in the logframe except “Spirited cooperation of the local SMEs and business organisations”, which in fact suppose to be developed by the project with selected business operators. This issue needs particular attention and/or additional expertise in the project, as none of the project partners have core professional experience in business and trade-related activities.

- **Impact prospects.**

There is no risk that wider project impact will be jeopardised by external factors. The assumptions at the level of PP1 have been already realised, so there is no danger that the project will have less impact because of external environment. Assumptions for PP2 are almost non-existing. The external environment around PP2 is not easy to work in, but not that risky to avoid working in.
A bright example of donor and sector coordination was the International Conference on conservation agriculture organised by NAFRI, in the Xieng Khouang province with the support from AFD Laos, CIRAD and ORCATAD project. Participants from Asia and Africa had an opportunity to exchange experiences in conservation agriculture with relevance to Laos. Generally, the synergy of donors’ action in the field of the project is well ensured.

- **Potential Sustainability.**

The project is well secured in terms of policy support for conservation agriculture technologies through the recently adopted Decree, which emphasises the spread of these technologies all over the country. Non-state actors are not involved in policymaking process in the field of project intervention and no support from the private sector is obtained. The assessment of policy support in trade and export-related activities of SMEs and business intermediaries is not relevant, as no structured action have been undertaken by the project so far. The project has high degree of environmental responsibility. Conservation agricultural technologies are built upon the sustainable use of natural resources: erosion prevention, soil

degradation prevention, crop rotation to increase yields and soil fertility. Eco-friendly products from Laos also represent environmentally favourable approach to export and trade development of the country. This approach has to be supported by the project in the remaining period.

- **Key observations and recommendations**

To date the project is well advanced in implementing activities and achievement of the PP1 There is not enough expertise in composition of project partnership to achieve the PP2 (trade facilitation and reinforcement of relevant intermediate business organizations' capabilities).

Recommendations:

To the grant beneficiary (CIRAD):
• adjust the logframe of the project in order to make activities, results, OVIs and assumptions consistent with PP1 and PP2 and the objectives of the Asia Invest programme.
• Add more activities, adjust result 3, and/or add an extra one, and develop corresponding OVIs in the logframe aimed at the achievement of PP2 to meet the requirements of Asia Invest Programme.
• Consider the fair trade scheme as an option for the achievement of project purpose 2 through establishing contacts and involving relevant players in Laos and in the EU for the project activities.
• Facilitate the promotion and development of trade and export potential of eco-friendly products from Laos based on conservation agriculture among relevant business stakeholders in Laos and in the EU.

To the Project partners:
• Consider a slight reallocation of the project budget in order to bring additional short-term expertise in trade (and fair trade), export and business development with private sector and intermediate operators in the agricultural sector;
• Pay particular attention to the organisation of planned trade seminars in Laos and France: relevant stakeholders should be invited to attend and a practical approach should be ensured.
• Consider organising additional seminars on fair trade opportunities.
• Facilitate inter-sector cooperation through the project in favour of PP2.
• Establish an internal monitoring system to ensure regular analysis of prospects for project sustainability aspect and present it as attachment to the quarterly updates.

VI. Links with other projects/programmes

As explained earlier, the ORCATAD project has been able to benefit from the close links between the development projects under way in the two provinces of Xieng Khouang and Xayaboury. The main ones are:

- PASS: Rural Development in southern Xayaboury
- PCADR: Capitalisation programme in support of the rural development policy
- PRONAE: Lao National Agro-ecology Programme
- PROSA: Sector-based Programme in Agro-ecology

These projects are financed by French cooperation, the French Development Agency, (AFD) and the French Fund for the World Environment (FFEM). The synergies with these projects can be summarised as follows:

- The projects finance the creation and maintenance of demonstration and training sites and the establishment of plots with farmers, which will make it possible to multiply the intervention sites in a consistent way.
- The ORCATAD project provides them with additional support in terms of communication and training and encourages links with the markets and the commercial sector, notably at the centre (MoIC). Putting the database online and its access via the website will add considerable value for these projects in particular and for every new development project in general.

Furthermore, the international projects working with NAFRI are also indirectly associated. In particular, the Centre for Information Technologies is supported by Swedish cooperation.

Finally, the MAF will encourage integration of agro-ecology (DMC) and conservation agriculture in future rural development projects. This point will be further considered below.

Enfin, suite à la monitoring mission, des contacts ont été pris avec le domaine du commerce equitable à travers

VII. Sustainability

The sustainability of the actions and results of the project is directly linked to:

- the on-going processes of transfer to local people involved in communication and training. This strategy is also that adopted for all the conservation agriculture projects. In particular, the local structures in each province and districts concerned are automatically associated with the projects, especially PAFO and the DAFO (Principal and District Agriculture and Forestry Offices)
- the on-going deliberations about the provincial agro-ecology publicity strategies initiated by the two provincial workshops held in June and July 2007
- the political desire to publicise agro-ecological techniques nationally

Whatever the scale of the intervention – villages, districts, provinces or central government – a structure for bringing together all those involved in rural development is in the process of being discussed and established. Only such a broad-based structure will be able to ensure the necessary financial and human resources. A strategy founded on the national network of village development clusters (Kum Ban Pattana) is being set up. Also, on the initiative of MAF, it will rest partly on the creation of sites for demonstration, training and service provision centred on conservation agriculture. Extra resources will be allocated, which could come from national resources, international projects, or from the establishment of specific development funds based on better management and preservation of natural resources.

In this active and promising national context, the approaches and results of the project will be greatly enhanced. All of the current direct and indirect partners will continue to be associated with the ongoing process. The strengthening of capacity brought about by the project will therefore also be thoroughly justified. On the other hand, it will be vital to cement the strong foundations of the methodology employed, i.e. a close and ongoing partnership between all the players in the development (farmers, extension workers, private sector and bankers, political leaders, sponsors etc.) and research.

An ongoing dialogue is being maintained with the political leaders and the various sponsors. An inter-donor arrangement is being established, largely on the initiative of the AFD, the EC and the World Bank for the 6 provinces in the north of Laos. It is already planned to include conservation agriculture in the proposed rural development process.

Contact person: *BOYER JOHNNY*
Signature:

ANNEXE 1: Action Plan and logical Framework For year 3

Name of the Asia-wide Programme: ASIA INVEST
Contract reference no.: LA/Asia-Invest II/04 (128402)
Project Title: Open Resources for Conservation Agriculture and Trade and Development (ORCATAD)
Name of Beneficiary: Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD)
Period covered by this Interim Report: 1 February 2009 to 31 July 2009
Due date of this Action Plan: 15 February 2009

Abbreviations and Acronyms

AFD	French Development Agency
ADB	Asian Development Bank
CA	Conservation Agriculture
CIRAD	Centre de Coopération Internationale en Recherche pour le Développement
DAFO	District Agriculture and Forestry Office
DMC	Direct seeding and Mulch-based Cropping systems
EU	European Union
FAN	Faculty of Agriculture of Nabong
FFEM	Fonds Français pour l'Environnement Mondial
LTPC	Lao Trade Promotion Centre
MAF	Ministry of Agriculture and Forestry
MoIC	Ministry of Industry and Commerce
NAFES	National Agriculture and Forestry Extension Service
NAFRI	National Agriculture and Forestry Research Institute
NNRBDP	Nam Ngum River Basin Development Sector Project
PAFO	Provincial Agriculture and Forestry Office
PASS	Rural Development Project for Southern Xayaboury
PCADR	Capitalisation Programme in support of the Rural Development Policy
PRONAE	Lao National Agro-ecology Programme
PROSA	Sector-Based Programme in Agro-ecology

1. Introduction

1.1. General Strategy of the period

According to the monitoring report, these recommendations were made and are the base of a general strategy of the period.

To the grant beneficiary (CIRAD): • adjust the logframe of the project in order to make activities, results, OVIs and assumptions consistent with PP1 and PP2 and the objectives of the Asia Invest programme.
• Add more activities, adjust result 3, and/or add an extra one, and develop corresponding OVIs in the logframe aimed at the achievement of PP2 to meet the requirements of Asia Invest Programme.
• Consider the fair trade scheme as an option for the achievement of project purpose 2 through establishing contacts and involving relevant players in Laos and in the EU for the project activities.
• Facilitate the promotion and development of trade and export potential of eco-friendly products from Laos based on conservation agriculture among relevant business stakeholders in Laos and in the EU.
To the Project partners: • Consider a slight reallocation of the project budget in order to bring additional short-term expertise in trade (and fair trade), export and business development with private sector and intermediate operators in the agricultural sector;
• Pay particular attention to the organisation of planned trade seminars in Laos and France: relevant stakeholders should be invited to attend and a practical approach should be ensured.
• Consider organising additional seminars on fair trade opportunities.
• Facilitate inter-sector cooperation through the project in favour of PP2.
• Establish an internal monitoring system to ensure regular analysis of prospects for project sustainability aspect and present it as attachment to the quarterly updates.

1.2 Objectives of the period

The specific objectives of the period are, first, the same that already planned:

- To build and finalize the comprehensive and open knowledge base on best practices in conservation agriculture,
- To organise capacity building activities for the farmer groups and extension services of Lao PDR on conservation agriculture techniques,
- To coordinate with the trade facilitation agencies,
- To build model demonstration plots which will substantiate the scope for trade in the produced crops both for international and local market,
- To build capacities at the institutional level in open source based IT&C solutions with sharp focus on the application of IT&C to agronomy and relevant beneficiary sectors like trade and commerce,
- To increase the awareness levels about the potential for international trade and investment in the area of eco-friendly agro-based products with specific focus on commercially significant crops, through two dissemination workshops, one in the target country and the other in Europe,

- and To produce dissemination material focussing on the prospects for international trade in eco-**friendly agro-based products** in the form of booklets, brochures and exhibits and highlighting the importance of conservation agriculture.

And, second, some new objectives more oriented to the fair trade scheme as an option for the achievement of project purpose 2 through establishing contacts and involving relevant players in Laos and in the EU for the project activities:

2. Description of activities

2.1 Activity 1: Project launch, preparation of a website and selection of field areas

Objectives

The aim of this first activity is to open a website which will disseminate information on the project, including soft and hard ware about conservation agriculture techniques to build a comprehensive and open knowledge base on best practices in conservation agriculture for certain cash crops. This knowledge base will be developed as a web-based application and will serve as an effective tool in the hands of business organisations to encourage the production of market oriented cash crops creating a vibrant international and rural economy.
The website will be opened at the beginning of the year 3.

e-forum : this activity has been canceled after discussion between NAFRI, CIRAD and EU delegation in Vientiane. The man days (10 days) allowed to this activity has been used for enriching the knowledge base.

Tasks and expected results

a) Open the project website:

Create an efficient tool of communication on the ***Orcatad*** project through the opening of the project website:

- Disseminating information on the project. The website will focus on providing comprehensive information to potential partners and professionals already involved in development projects. Web pages will show the objectives of the programme.
- Disseminating technical information on the conservation cropping and farming systems. This information will be provided by Activity 2 (Implementation of conservation techniques).
- Internal services to support national activities and to share knowledge and know how
-

Indicators of achievement

This first activity will result in the standard description of cropping systems in close interaction with activity 2 and 3. The website will be the centre of exchange for the partners of the project.
It is an external linkage to promote and to extract information from the world community. It is also a tool for accelerating the design of the training activities to the benefit of extension services, farmers, researchers, policy makers, funders, traders…

The objectively verifiable indicators of achievement are

- Existing operational website
- Frequents visits/hits
- Number of contributors

Staff involved in this activity

Personnel	Activity	Description	Number of units
NAFRI (Software Developer)	1a	Open the website	0
NAFRI (Technician)	1a	Open the website	0
NAFRI (Technician)	1a	Open the website	0
NAFRI (Trainer)	1a	Open the website	0
NAFRI (Agronomist)	1a	Open the website	0
Project Manager Applicant	1a	Open the website	0
Cirad Senior Expert	1a	Open the website	0
WU Senior Expert	1a	Open the website	0
		TOTAL ACTIVITY 1a	**0**
	TOTAL ACTIVITY 1	NAFRI (Software Developer)	0
		NAFRI (Technician)	0
		NAFRI (Technician)	0
		NAFRI (Trainer)	0
		NAFRI (Agronomist)	0
		Project Manager Applicant	0
		Cirad Senior Expert	0
		WU Senior Expert	0
		TOTAL ACTIVITY 1	**0**

2.2 Activity 2: Implementation of conservation techniques

Objectives

The second activity aims in the first hand to develop alternative techniques on conservation agriculture. This activity will also build eco-friendly plots for demonstration. In the second hand the quality of this practice will be studied by its impact on soil environment. Results from these two works will be fed into the knowledge base.

Tasks and expected results

a) Bibliography:

(Already completed in the first year)

b) Establishing demonstration plots:

This activity will be done in different ecological systems and in farmer fields where experiments based on eco-friendly techniques will be adapted based on climatic, bio-physical and socio economic contexts. Different main annual crops will be studied. These

experimental fields will be also a demonstrating plot for the interested audience. The space for the demonstration plots and their maintenance will be the contribution of the NAFRI.

c) Verifying eco-friendly products through chemical and biological soil quality:

In parallel, these practices have also for objective to protect the environment. Soil is a very good indicator for the health of environment related to agricultural practices. To evaluate the positive impact on the soil environment (chemical and biological parameters), it is important to study these impacts on soil biology. The biodiversity of soil fauna and the intrinsic quality of the litter will be studied by:

- Sampling of soil fauna for identification (100 samples)
- Sampling of soil for chemical analyses
- Sampling of litters to analyse their chemical intrinsic quality
-

d) Finalise recommendations for the knowledge base:

The recommendations for the building up of the knowledge base will be made periodically based on the lessons learnt from field experiments. This continuous process of enriching the knowledge base will also be complemented by Activity 3. At the end of this activity, the final recommendations on conservation agricultural practices will be made for the knowledge base.

Indicators of achievement

This second activity will develop eco-friendly techniques for conservation agricultural practices and for various eco-systems with demonstrating plots to the target groups. In parallel we will be able to characterize the eco-friendly quality by its positive impact on soil environment (chemical and biological factors). The results of this activity will form the core of the knowledge base.

The objectively verifiable indicators of achievement are:

- 2 Provinces
- 3 districts/Province
- 30 farmers/district
- 6 demonstration plots
- 100 soils analyses
- 10 cropping systems/Province
-

Staff involved in this activity

Personnel	Activity	Description	Number of units
NAFRI (Software Developer)	2b	Demonstration plots	0
NAFRI (Technician)	2b	Demonstration plots	0
NAFRI (Technician)	2b	Demonstration plots	4
NAFRI (Trainer)	2b	Demonstration plots	4
NAFRI (Agronomist)	2b	Demonstration plots	20
Project Manager Applicant	2b	Demonstration plots	1
Cirad Senior Expert	2b	Demonstration plots	1
WU Senior Expert	2b	Demonstration plots	0
		TOTAL ACTIVITY 2b	**30**
NAFRI (Software Developer)	2c	Ecofriendly products	0
NAFRI (Technician)	2c	Ecofriendly products	2
NAFRI (Technician)	2c	Ecofriendly products	0
NAFRI (Trainer)	2c	Ecofriendly products	4
NAFRI (Agronomist)	2c	Ecofriendly products	10
Project Manager Applicant	2c	Ecofriendly products	3
Cirad Senior Expert	2c	Ecofriendly products	0
WU Senior Expert	2c	Ecofriendly products	0
		TOTAL ACTIVITY 2c	**19**
NAFRI (Software Developer)	2d	Information for Knowledge Base	0
NAFRI (Technician)	2d	Information for Knowledge Base	0
NAFRI (Technician)	2d	Information for Knowledge Base	4
NAFRI (Trainer)	2d	Information for Knowledge Base	2
NAFRI (Agronomist)	2d	Information for Knowledge Base	5
Project Manager Applicant	2d	Information for Knowledge Base	0
Cirad Senior Expert	2d	Information for Knowledge Base	0
WU Senior Expert	2d	Information for Knowledge Base	5
		TOTAL ACTIVITY 2d	**16**
	TOTAL ACTIVITY 2	NAFRI (Software Developer)	0
		NAFRI (Technician)	4
		NAFRI (Technician)	6
		NAFRI (Trainer)	10
		NAFRI (Agronomist)	35
		Project Manager Applicant	4
		Cirad Senior Expert	1
		WU Senior Expert	5
		TOTAL ACTIVITY 2	**65**

Duration of tasks

Year 2 Activities	Semester 1					
	1	2	3	4	5	6
2b - Establishing demonstration plots:						
2c - Verifying eco-friendly products (soil quality):						
2d - Finalise recommendations for the knowledge base:						

2.3 Activity 3: Training of farmers and extension services

Objectives

The aim of this activity is to support and reinforce the existing training organizations with specific focus on conservation agriculture. The conservation agriculture techniques, specifically, those relating to direct sowing and cover crops are new and it is necessary to define new training modules for promotion and extension of these eco-friendly cropping systems.

Tasks and expected results

a) Prepare multimedia documents

The training of the target groups will consist of modules like reinforcement on general agronomy, holistic and integrated approach on agro-systems, guiding principles on conservation agriculture, in particularly DMC and illustrated examples of DMC from the demonstration plots of the action.

b) Training of trainers

Initially the training will focus on the trainers from MAF and NAFES. Based on the feedback collected from the trainers, the improvements on the design and the organization of the content of the training modules on conservation agriculture will be implemented. The improved versions will be subjected to testing and feedback until a satisfactory response level is reached.

c) Farmers and extension workers Fields Schools

Practical training on specific topics will be provided to the farmers and the staff of the extension services. Organised by NAFRI, as contributively to the action, technical training through demonstration plot units located on selected sites representing socio-economic and biophysical diversity, devoted to technicians, extension specialists, development agents and farmers. Systematic feed back will be generated at the end of the training sessions so that the appropriateness of the knowledge base can be studied and thereby improve the knowledge base itself.

d) Fields visits

To create better awareness on environmental impacts of conventional agriculture (agricultural externalities) compared with eco-friendly cropping and farming systems (sensitization) targeted towards farmers, extension workers, Rural Development Project managers and policy makers.

Indicators of achievement

- Production of full-fledged training modules, leaflets, synthesis, and publication of key documents related to advantages of conservation agriculture and its impacts at local, regional national and international level
- Contribution to building up and refining of Knowledge base and E-learning activities combined with “thematic fora” and a web site
- New training modules on conservation techniques for different target groups
- Sensitization of policy-makers, decision-makers both in agriculture, education, research and trade and development about the alternative techniques like DMC cropping systems.

The objectively verifiable indicators of achievement are:

- Availability and diversity of the materials on both soft and hard formats
- 1 long term (6 months) practical session in each province

- 3 short term (8 days) training sessions in each province
- 5 NAFRI Staff (ToT)/District trained
- 10 extension workers/District
- 200 fields visits

Staff involved in this activity

Personnel	Activity	Description	Number of units
NAFRI (Software Developer)	3a	Prepare documents	0
NAFRI (Technician)	3a	Prepare documents	0
NAFRI (Technician)	3a	Prepare documents	10
NAFRI (Trainer)	3a	Prepare documents	4
NAFRI (Agronomist)	3a	Prepare documents	2
Project Manager Applicant	3a	Prepare documents	0
Cirad Senior Expert	3a	Prepare documents	0
WU Senior Expert	3a	Prepare documents	0
		TOTAL ACTIVITY 3a	**16**
NAFRI (Software Developer)	3b	Training of trainers	5
NAFRI (Technician)	3b	Training of trainers	5
NAFRI (Technician)	3b	Training of trainers	5
NAFRI (Trainer)	3b	Training of trainers	40
NAFRI (Agronomist)	3b	Training of trainers	10
Project Manager Applicant	3b	Training of trainers	0
Cirad Senior Expert	3b	Training of trainers	0
WU Senior Expert	3b	Training of trainers	0
		TOTAL ACTIVITY 3b	**65**
NAFRI (Software Developer)	3c	Farmers Fields Schools	0
NAFRI (Technician)	3c	Farmers Fields Schools	5
NAFRI (Technician)	3c	Farmers Fields Schools	5
NAFRI (Trainer)	3c	Farmers Fields Schools	25
NAFRI (Agronomist)	3c	Farmers Fields Schools	5
Project Manager Applicant	3c	Farmers Fields Schools	0
Cirad Senior Expert	3c	Farmers Fields Schools	0
WU Senior Expert	3c	Farmers Fields Schools	0
		TOTAL ACTIVITY 3c	**40**
NAFRI (Software Developer)	3d	Fields visits	0
NAFRI (Technician)	3d	Fields visits	0
NAFRI (Technician)	3d	Fields visits	2
NAFRI (Trainer)	3d	Fields visits	4
NAFRI (Agronomist)	3d	Fields visits	2
Project Manager Applicant	3d	Fields visits	0
Cirad Senior Expert	3d	Fields visits	0
WU Senior Expert	3d	Fields visits	0
		TOTAL ACTIVITY 3d	**8**
TOTAL ACTIVITY 3		NAFRI (Software Developer)	5
		NAFRI (Technician)	20
		NAFRI (Technician)	12
		NAFRI (Trainer)	73
		NAFRI (Agronomist)	19
		Project Manager Applicant	0
		Cirad Senior Expert	0
		WU Senior Expert	0
		TOTAL ACTIVITY 3	**129**

Duration of tasks

Year 2 Activities	Semester 1					
	1	2	3	4	5	6
3a - Prepare multimedia documents:						
3b - Training of Trainers						
3c - Farmers and Extenion workers fields school						
3d - Fields visits:						

2.4 Activity 4: Building up of the knowledge base

Objectives

The aim of this activity is to build the knowledge base on conservation agricultural practices. This activity will draw upon the activities 1, 2 and 3 like bibliography, implementation of alternative techniques and the capacity building activities. This will result in the fine-tuned final version of the knowledge base in the form of CD-ROMs and a web version.

Tasks and expected results

b) Building of the core of the knowledge base

The knowledge base launched with activity 1, will be well formulated from the results of the Activity 2, i.e. Implementation of Conservation techniques. This will form the core of the knowledge base drawing lessons from field, from maintaining demonstration plots. This activity will summarise various adaptations of techniques for different ecological contexts.

c) Enriching the knowledge base

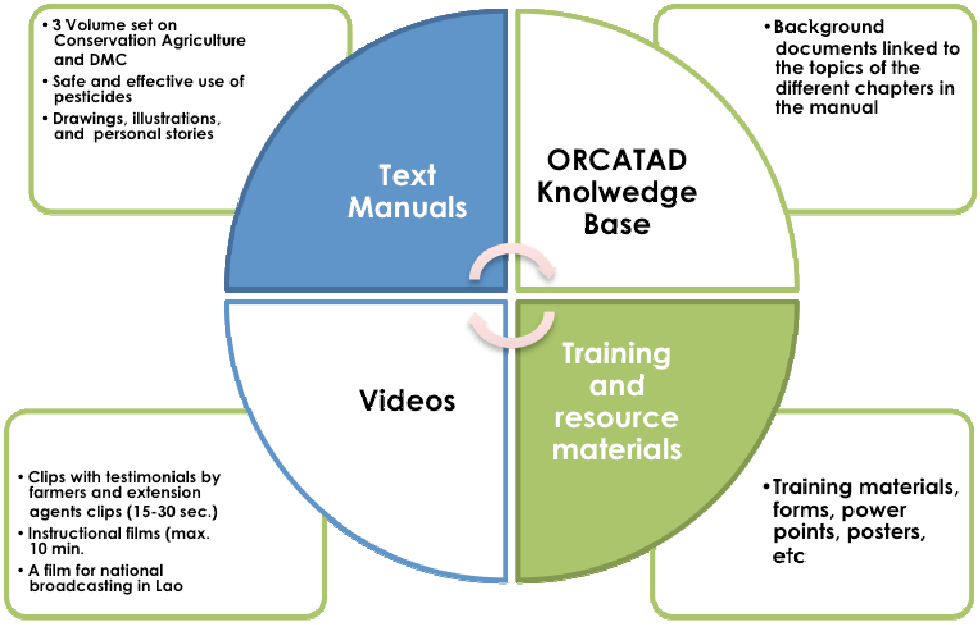
The knowledge base will go through a continuous process of refinement and enrichment with the implementation of Activity 3, i.e. Training of farmers and extension services. This will provide the necessary inputs to improve the quality and the nature of organisation of the knowledge base. The appropriateness of the knowledge base will be strongly considered and implemented accordingly, with the help of the communication expert.

d) Final Release

The knowledge base will be finalised with all the recommendations for conservation agricultural techniques towards the end of the action. The web version will be finalised and the CD-ROM version released.

165 and 110 man days (technicians) have been allowed for the final release. This number of man days is linked to the development of a multimedia training package on Conservation Agriculture (MMTP).

The multi-media training package consists of the following components: a printed text manual comprising 3 volumes, related film materials, training materials, other related extension materials and an on-line knowledge base on conservation agriculture and DMC systems.



The activities performed are broader that the final release. Technicians are involved in developing the text manuals (writeshop session organized on kenthao, southern of Xayabury province from 24 to 28 March), filming and making video, developing additional training materials (technical leaflets) and building and enriching the knowledge base.

Indicators of achievement

The main results of the activity are the final versions of the web-based and CD-ROMs of the Knowledge Base on Conservation Agriculture for Lao PDR.
The objectively verifiable indicators of achievement are:

- Availability and diversity of the materials on both soft and hard formats
- Number of cropping systems with conservation agriculture techniques well described according to the socio-economic and biophysical context, environmental impact and their conditions of adoption by the farmers and their conditions of extension

Staff involved in this activity

Personnel	Activity	Description	Number of units
NAFRI (Software Developer)	4a	Initial Knowledge Base	0
NAFRI (Technician)	4a	Initial Knowledge Base	0
NAFRI (Technician)	4a	Initial Knowledge Base	0
NAFRI (Trainer)	4a	Initial Knowledge Base	0
NAFRI (Agronomist)	4a	Initial Knowledge Base	0
Project Manager Applicant	4a	Initial Knowledge Base	0
Cirad Senior Expert	4a	Initial Knowledge Base	0
WU Senior Expert	4a	Initial Knowledge Base	0
		TOTAL ACTIVITY 4a	**0**
NAFRI (Software Developer)	4b	Building Knowledge Base	5
NAFRI (Technician)	4b	Building Knowledge Base	25
NAFRI (Technician)	4b	Building Knowledge Base	25
NAFRI (Trainer)	4b	Building Knowledge Base	2
NAFRI (Agronomist)	4b	Building Knowledge Base	2
Project Manager Applicant	4b	Building Knowledge Base	0
Cirad Senior Expert	4b	Building Knowledge Base	0
WU Senior Expert	4b	Building Knowledge Base	0
		TOTAL ACTIVITY 4b	**59**
NAFRI (Software Developer)	4c	Enriching Knowledge Base	10
NAFRI (Technician)	4c	Enriching Knowledge Base	50
NAFRI (Technician)	4c	Enriching Knowledge Base	25
NAFRI (Trainer)	4c	Enriching Knowledge Base	10
NAFRI (Agronomist)	4c	Enriching Knowledge Base	10
Project Manager Applicant	4c	Enriching Knowledge Base	0
Cirad Senior Expert	4c	Enriching Knowledge Base	0
WU Senior Expert	4c	Enriching Knowledge Base	5
		TOTAL ACTIVITY 4c	**110**
NAFRI (Software Developer)	4d	Final Release	20
NAFRI (Technician)	4d	Final Release	165
NAFRI (Technician)	4d	Final Release	110
NAFRI (Trainer)	4d	Final Release	20
NAFRI (Agronomist)	4d	Final Release	10
Project Manager Applicant	4d	Final Release	0
Cirad Senior Expert	4d	Final Release	0
WU Senior Expert	4d	Final Release	10
		TOTAL ACTIVITY 4d	**335**
	TOTAL ACTIVITY 4	NAFRI (Software Developer)	35
		NAFRI (Technician)	240
		NAFRI (Technician)	160
		NAFRI (Trainer)	32
		NAFRI (Agronomist)	22
		Project Manager Applicant	0
		Cirad Senior Expert	0
		WU Senior Expert	15
		TOTAL ACTIVITY 4	**504**

Duration of tasks

Year 2	Semester 1					
Activities	**1**	**2**	**3**	**4**	**5**	**6**
4b - Building of the core of the knowledge base:						
4c - Enriching the knowledge base:						
4d - Final release						

2.5 Activity 5: Communication and Dissemination Activity

Objectives

The aim of this activity is to bridge between the various stakeholders of the action. This activity will progress in parallel with other activities to attain the maximum visibility and to create awareness about the trade potential for agro-based SMEs.

Tasks and expected results

c) Organisation of Trade Potential Seminar in Europe (France):

A trade potential seminar will be organised in Europe (Montpellier, France) to showcase the opportunities for investments and trade with Lao PDR. This seminar will be based on fair trade opportunities. Fair Trade facilitation agencies and potential investors from European countries will be invited for this seminar.

d) Organisation of Final workshop, Lao PDR:

A final workshop towards the end of the action will be organised in Lao PDR. This workshop will bring together various stakeholders (primary, secondary and tertiary) on a single platform to disseminate the results of the action. The final versions of the knowledge base in the form of CD-ROMs and the web version will be formally launched in this workshop. Care will be taken to ensure the participation of policy makers from different ministries of Lao PDR.

10 man days have been scheduled to organize and attend the workshop organize in 2009. A writeshop session has been organized in Kenthao (Xayabury province) during 5 days (24 – 28 March 2009) and several meetings have been organized with the departments of the ministry of agriculture and forestry (DoA, DoLF, NAFRI, NAFES, PSO) in Vientiane in order to define a national training and communication strategy in the field of conservation agriculture. Additional workshop will be schedule in June and July 2009 to plan and carry-out the final workshop of the project that will be organized in Vientiane in July.

Indicators of achievement

The result of the activity is a wide-ranging awareness created both in Europe and Lao PDR about the action and knowledge base on one hand and the potential for investment and trade in eco-friendly agricultural products. The broad dissemination in France and Lao PDR will help improve the image of Lao PDR as better destination of investments in agricultural sector.

The objectively verifiable indicators of achievement are:

- Numbers of mutimedia products
- 500 copies of all modules products distributed
- 1000 copies of cd-rom distributed

- Numbers of participants in the Trade Seminar in France and the final workshop in Lao PDR

Staff involved in this activity

Personnel	Activity	Description	Number of units
NAFRI (Software Developer)	5c	Trade seminar in France	5
NAFRI (Technician)	5c	Trade seminar in France	0
NAFRI (Technician)	5c	Trade seminar in France	0
NAFRI (Trainer)	5c	Trade seminar in France	0
NAFRI (Agronomist)	5c	Trade seminar in France	0
Project Manager Applicant	5c	Trade seminar in France	5
Cirad Senior Expert	5c	Trade seminar in France	5
WU Senior Expert	5c	Trade seminar in France	5
		TOTAL ACTIVITY 5c	**20**
NAFRI (Software Developer)	5d	Final workshop in Lao PDR	10
NAFRI (Technician)	5d	Final workshop in Lao PDR	5
NAFRI (Technician)	5d	Final workshop in Lao PDR	5
NAFRI (Trainer)	5d	Final workshop in Lao PDR	5
NAFRI (Agronomist)	5d	Final workshop in Lao PDR	5
Project Manager Applicant	5d	Final workshop in Lao PDR	5
Cirad Senior Expert	5d	Final workshop in Lao PDR	10
WU Senior Expert	5d	Final workshop in Lao PDR	5
		TOTAL ACTIVITY 5d	**50**
TOTAL ACTIVITY 5		NAFRI (Software Developer)	15
		NAFRI (Technician)	5
		NAFRI (Technician)	5
		NAFRI (Trainer)	5
		NAFRI (Agronomist)	5
		Project ManagerApplicant	10
		Cirad Senior Expert	15
		WU Senior Expert	10
		TOTAL ACTIVITY 5	**70**

Duration of tasks

Year 2 Activities	Semester 1					
	1	2	3	4	5	6
5c- Fair Trade seminar in France						
5b - Final workshop in Lao PDR						

2.6. New activities Specific notes on fair trade orientations

According to the monitoring report, it will be interesting to consider the fair trade scheme as an option for the achievement of project purpose 2 through establishing contacts and involving relevant players in Laos and in the EU for the project activities.

Some new activities are planed: establishing contact and share information about fair trade.

New activity 1: Some contacts were already taken with Fair Trade Laos.
Fair Trade Laos is established by a small group of motivated business people and NGO's that see the potential of Fair Trade to improve producers' and farmers' lives and at the same

time offer customers a high-quality product. However, Fair Trade is not a widely known concept in Laos, and only 4 companies are officially certified by FLO or IFAT at present.
Services considered by FTL include:

1. Certificates and labels for vendors and producer groups.
2. Member promotion on website, publications and other media
3. Certification standards verification
4. Training services for producers
5. Financial services for producers
6. Secretarial services for producers
7. Product marketing services through website

FairTrade Lao needs to.:

- FTL has to identify (and help articulate) the needs and demands of potential members and markets, and has to decide on its mission, vision and the services it will provide.
- FTL needs to become a legally recognized entity. The group will choose an organizational form that suits both its mission and the Lao legislation. Options considered are: NGO/CSO and Business Association.
- FTL will develop links with Government organizations. Partners will be recruited for their capacity for cooperation.
- FTL needs to raise funds to develop its potential. Members presently pay a membership fee of 250.000 kip per year, which is used to cover the running costs, and to produce some promotional materials.
- Since FTL members run businesses or are employed full-time by NGO's, they are not able to put in the time it needs to set up and run a new organisation. Therefore, FTL is looking to engage a Coordinator who can take the lead on building the foundations and expanding the network and scope of activities of FTL.
- To kick-start and run a fully fledged Fair Trade Organisation, more resources are needed.

In EU, some contact was taken with people who organized the 3rd Fair Trade International Symposium (FTIS2008).The 3rd symposium was held in Montpellier (France) on May 14th-16th, 2008 on the topic: " New dimensions in fair trade: implications and challenges".
The main theme of this 3rd Fair Trade International Symposium (FTIS 2008) was the unprecedented expansion of Fair Trade, its implications and the challenges it presents to its actors.

Until the late 90s, Fair Trade represented a narrow market, concerned a limited number of economic actors and was confined to specific products sold in specialized retail outlets. Ever since, Fair Trade has experienced continuous and exponential growth in developed countries, both in terms of turnover and public awareness. One can observe an increase in the number and the variety of Fair Trade products and actors involved a multiplication of systems of guarantee, a broadening of the definition of Fair Trade.

This scaling up of Fair Trade faced by the traditional actors of the movement also questions its future. Should the initial Fair Trade project be reconsidered in the light of the on-going changes? What are the impacts of Fair Trade initiatives on producers and consumers? How do they compare with the movement's initial objectives? Does the multiplication of guarantee systems threaten the credibility of the movement and call for public regulations? These questions engage both the actors of the Fair Trade movement and social scientists. The

growing number of research projects and articles on Fair Trade in various social sciences (economics, management, sociology, political science, geography, law) further demonstrates public interest for this topic.

The objectives of the symposium were to present the state of the art concerning studies on Fair Trade, to share information about on-going and coming research projects, and to confront opinions on the future prospects of Fair Trade.

The program was composed of two moments for plenary conferences, two roundtables, a presentation of the posters and 19 workshops articulated around the six transverse topics :

- Topic A :The diversification of types of organisations in the North
- Topic B : Consumers and their reaction to the growth of fair trade
- Topic C : Producers: their organizations; the impact of fair trade on their conditions
- Topic D : New products, services and systems associated with or similar to fair trade
- Topic E : Fair trade regulation: guarantee, labelling, certification and accreditation systems
- Topic F : The political and ethical issues surrounding fair trade

Round Table 1: From Fair Trade to fairness in trade: appraisal and perspectives

Round Table 2: What is the role of actors from the South in the fair trade project?

The main objective of the trade seminar to organize in France will be to establish contacts and involving relevant players in Laos and in the EU trough the network involved in the FTIS2008 especially through the FAIRNESS, Research Network on Fair Trade.
This trade seminar will be held at Montpellier and will be organized by Cirad which is one of the main organizers of FTIS (http://www.ftis2008.org/).

3. Implementing partners

Activities	Tasks	Implementing partners
ACTIVITY 1: Project launch, preparation of a website and selection of field areas	**1a** -Open the project website	NAFRI
ACTIVITY 2: Implementation of conservation techniques	**2b -** Establishing demonstration plots	NAFRI + CIRAD
	2c - Verifying eco-friendly products (soil quality)	NAFRI + CIRAD
	2d - Finalise recommendations for the knowledge base	NAFRI + CIRAD + WU
ACTIVITY 3: Training of farmers and extension services	**3a -** Prepare multimedia documents	NAFRI + CIRAD
	3b - Training of Trainers	NAFRI + CIRAD + WU
	3c - Farmers and Extension workers fields school	NAFRI + CIRAD + WU
	3d - Fields visits	NAFRI + CIRAD
ACTIVITY 4: Building up of the knowledge base	**4b -** Building of the core of the knowledge base:	NAFRI + CIRA
	4c - Enriching the knowledge base	NAFRI + WU
	4d - Final release	NAFRI + WU
ACTIVITY 5: Communication and Dissemination Activity	**5b-** Trade seminar in France	CIRAD
	5c- Final Workshop in Lao PDR	NAFRI + CIRAD

4. Summary Table of Activities

Year 2 Activities	Expected results	Indicators	Semester 1					
			1	2	3	4	5	6
ACTIVITY 1: Project launch, preparation of a website and selection of field areas	**1a** -Open the project website: A project website is linked to knowledge base on-line	* Operational website * Frequents visits/hits * Number of contributors						
ACTIVITY 2: Implementation of conservation techniques	**2b -** Establishing demonstration plots	* 2 Provinces * 3 districts/Province * 30 farmers/district * 6 demonstration plots * 100 soils analyses * 10 cropping systems/Province						
	2c - Verifying eco-friendly products (soil quality)							
	2d - Finalise recommendations for the knowledge base							
ACTIVITY 3: Training of farmers and extension services	**3a -** Prepare multimedia documents	* Availability and diversity of the materials on both soft and hard formats * 1 long term (6 months) practical session in each province * 3 short term (8 days) training sessions in each province * 5 NAFRI Staff (ToT)/District trained * 10 extension workers/District * 200 fields visits						
	3b - Training of Trainers							
	3c - Farmers and Extension workers fields school							
	3d - Fields visits							
ACTIVITY 4: Building up of the knowledge base	**4b -** Building of the core of the knowledge base	* Availability and diversity of the materials on both soft and hard formats * Number of cropping systems with conservation agriculture						
	4c - Enriching the knowledge base							

	4d - Final release	techniques well described according to the socio-economic and biophysical context, environmental impact and their conditions of adoption by the farmers and their conditions of extension						
ACTIVITY 5: Communication and Dissemination Activity	**5a -** Preparation of dissemination materials	* 500 copies of all modules products distributed * 1000 copies of cd-rom distributed * Numbers of participants in the Trade Seminar in Lao PDR						
	5b - Organisation of Trade Potential Seminar in Lao PDR							

5. Logical Framework

LOGICAL FRAMEWORK

	Intervention logic	Objectively verifiable indicators of achievement	Objectively verifiable indicators of achievement of Year 3	Sources and means of verification
Overall objectives	** To facilitate the integration of Lao PDR into the fast pacing global information society using ICT tools for promotion of conservation agricultural techniques in turn promoting trade in eco-friendly agro products*	*Increased adoption of conservation agriculture techniques in the target provinces resulting in enhanced production of eco-friendly products available of export market*	In Years 2 and 3	*Availability of the open-source based knowledge base on conservation agriculture online* *<u>Agricultural statistics from:</u>* ** Ministry of agriculture et forestry* ** Provincial and district extension services* ** Surveys*
Project purpose	** To increase the practice of conservation agricultural techniques and production of eco-friendly agro-based goodsby using IT&C solutions* ** To reinforce the institutional capabilities of intermediary business organisations and SMEs of LaoPDR in respect to niche market and new business opportunities in* *the international market for eco-friendly products*	*10 cropping systems/Province with conservation agriculture techniques well described according to the socio-economic and biophysic context and their conditions of adoption* *One project website linked to database of conservation agricultural techniques and production* *extension of conservation agriculture techniques in 2 Provinces* *3 districts in each province = 6 districts each year* *Requests of others provinces*	More than 10 cropping systems combining annual crops, perreneal crops and animals In 2008, prospect for medicinal plants and Non Timber Forest Products (NTFPs) In year 3 Already: : 4 districts in Xayaboury Province, 3 districts in Xieng Khouang Province and 3 districts in Vientiane Province Already: requests from Champassack and Luang Prabang and from the 6 districts inthe center and the north of Sayaboury Province	*Field Reports and quarterly updates of the project prepared by the project team* *<u>Agricultural statistics from:</u>* ** Ministry of agriculture et forestry* ** Provincial and district extension services* ** Surveys*
Expected results	***Concrete Outputs:*** ** Sources of knowledge base on conservation agricultural techniques for certain cash crops on the internet and other media built* ** Best practices in conservation agriculture adapted by farmers in the targeted areas* ** knowledge of the business organizations and SMEs about the potential for international trade (production and marketing mechanisms) in eco-friendly products enhanced*	*Operational website with e-forum* Synthesis from 300 soils analyses 500 copies of all modules products distributed 1000 copies of cd-rom distributed 30 farmers/district = 180 farmers each year ** 6 demonstration plots* ** 5 interventions in the media (TV, Radio, newspapers…) each year* * 2 trade seminars (1in RDP Lao, 1 in France) ** 2 communication seminars/year* * 1 launch and 1 final workshop ** 1 long term (6 months) practical training session in each province each year* ** 3 short term (1 week to 10 days) training sessions in each province each year* ** 5 NAFRI Staff trained during the project* * 2 NAFRI staff (ToT)/district = 6 NAFRI staff each year (ToT) * 10 Extension workers/district = 60 extension workers each year ** 200 fields visits each year by farmers, extensionists, policy makers, media, Rural Development Project managers...*	In beginning of year 3 Already started (200 soil sampling and anysis) In Years 2 and 3 In Years 2 and 3 Already started with NAFRI/PRONAE, MAF/PROAS and MAF/PASS projects in 3 districts of Xieng Khouang Province and 4 district in the South of Sayaboury Province. More than 2 000 ha are concerned. In Years 2 and 3 Demonstration plots in 14 districts with PRONAE, PROSA and PASS Projects In year 2 and 3 In year 2 and 3 Two provincial workshops in june and July 2007 Launch Worshop in september 2007 Already started with NAFRI/PRONAE, MAF/PROAS and MAF/PASS projects Already started with NAFRI/PRONAE, MAF/PROAS and MAF/PASS projects Already started with NAFRI/PRONAE project Already started with NAFRI/PRONAE project Already started with PRONAE, PROSA et PASS projects. Already, more than 1000 visits in 2008 into the two Provinces with PRONAE, PROSA and PASS projects.	*<u>A project website linked to knowledge base on-line</u>* ** fréquent visits/hits of the project website* *Availability and diversity of the materials on both soft and hard formats* *<u>Regular reports and seminars of the project</u>* *, associated projects and NAFRI* *<u>Reports from:</u>* ** Ministry of Agriculture and Forestry* ** Ministry of agriculture et forestry* ** Provincial and district extension services* ** Rural Developement Projects (PRONAE…)* *<u>Dissemination seminars and materials</u>* *in form of brochures and exhibits* *One trade potential dissemination seminar in France* *One fina workshop in Lao PDR,* *to desseminate the products adressing the business communities an intermediary business organisations*
New activities In year 3	*Consider the fair trade scheme as an option for the achievement of project purpose 2 through establishing contacts and involving relevant players in Laos and in the EU for the project activities*	** Identify relevent players in Lao PDR* ** Identify relevant players in UE* ** Organize a fair trade seminar in France*	*Link with the FTIS2008 (Fair Trade International Symposium 2008 at Montpellier/France)*	*Report on fair trade seminar in France* *Final Report*

6. Summary Table of Forecast Expenditures

Contractual Budget (ALL YEARS)		Forecast Expenditures for the Year 3			
Expenses	**Costs (in EUR)3**	**Units**	# of units	**Unit rate (in EUR)**	**Costs (in EUR)**
1. Human Resources					
1.1 Salaries (gross amounts, local)					
1.1.1 NAFRI Technician	10 500,00	Per day	269	20,00	5 380,00
1.1.2 NAFRI Technician	10 500,00	Per day	183	20,00	3 660,00
1.1.3 Administrative/ support Staff					
1.2 Salaries (gross amounts, expat/int. staff)					
1.2.1 NAFRI Senior Expert (Software Developer)	6 300,00	Per day	45	60,00	2 700,00
1.2.2 NAFRI Senior Expert (Trainer)	18 000,00	Per day	120	60,00	7 200,00
1.2.2 NAFRI Senior Expert (Agronomist)	18 000,00	Per day	81	60,00	4 860,00
1.2.4 Senior Cirad expert	30 940,00	Per day	16	476,00	7 616,00
1.2.5 Project Manager Applicant	36 855,00	Per day	14	405,00	5 670,00
1.2.6 Senior WU expert	27 750,00	Per Day	30	370,00	11 100,00
1.3 Per diems for missions/travel					
1.3.1 Abroad (project staff)					
1.3.1.1 France	3 400,00	Per diem	20	170,00	3 400,00
1.3.1.2 RDP Lao	23 000,00	per diem	44	100,00	4 400,00
1.3.2 Local (project staff)					
1.3.2.1. NAFRI Senior Expert (trainer) Lao PDR	4 800,00	Per diem	75	32,00	2 400,00
1.3.2.2. NAFRI Senior Expert (Agronomist) Lao PDR	4 800,00	Per diem	75	32,00	2 400,00
1.3.2.3 NAFRI Technician Lao PDR	4 800,00	Per diem	75	32,00	2 400,00
1.3.3 Seminar/conference participants					
Subtotal Human Resources	**199 645,00**				**63 186,00**
2. Travel					
2.1. International travel					
2.1.1 Asia - Europe	3 600,00	Per flight	3	1 200,00	3 600,00
2.1.2 Europe - Asia	4 800,00	Per flight	2	1 200,00	2 400,00
2.1.3 Europe - Europe	500,00	Per flight	1	500,00	500,00
2.1.4 Asia - Asia	2 250,00	Per flight	1	250,00	250,00
2.2 Local transportation	800,00	Per month	1	800,00	800,00
Subtotal Travel	**11 950,00**				**7 550,00**
3. Equipment and supplies					
3.1 Purchase and rent of vehicles					
3.1.1 Purchase of vehicules	0,00	Per vehicle	0	0,00	0,00
3.1.2 Rent of vehicules	2 700,00	Per day	20	60,00	1 200,00
3.2 Furniture, computer equipment					
3.2.1 Personal Computer, laptop and peripherics	12 000,00	11 Units	0	12 000,00	0,00
3.2.2 Colour printer network laser	3 000,00	2 Units	0	3 000,00	0,00
3.2.3 Video equipment (3CCD camera DV, Storage, Editor...)	3 000,00	1 Unit	0	3 000,00	0,00
3.2.4 Photographic equipment (1 SLR Camera, 2 lens, Bag, tripod, Digitzer, scanner...)	6 000,00	2 Units	0	6 000,00	0,00
3.2.5 Video projector	3 000,00	2 Units	0	3 000,00	0,00
3.3. Instruments for macrofauna identification	2 400,00		0	2 400,00	0,00
3.4 Spare parts/equipments for machines, tools	0,00			0,00	0,00
Subtotal Equipment and supplies	**32 100,00**				**1 200,00**
4. Local office/Action costs					
4.1 Vehicle costs	8 100,00	Per month	6	300,00	1 800,00
4.2 Office rent	0,00	Per month	0	0,00	0,00
4.3 Consumables - office supplies	0,00	Per month	0	0,00	0,00
4.4 Other services (tel/fax, electricity/heating, maintenance)	0,00	Per month	0	0,00	0,00
Subtotal Local office/Action costs	**8 100,00**				**1 800,00**
5. Other costs, services					
5.1 Publications	1 500,00		0	1500,00	0,00
5.2 Studies, research	21 900,00		100	73,00	7 300,00
5.3 Auditing costs	0,00		0	0,00	0,00
5.4 Evaluation costs	0,00		0	0,00	0,00
5.5 Translation, interpreters	4 000,00		2	1500,00	3 000,00
5.6 Financial services (bank guarantee costs etc.)	0,00		0	0,00	0,00
5.7 Costs of conferences/seminars	8 000,00		2	2000,00	4 000,00
5.8 Bibliography	1 000,00		1	2000,00	2 000,00
5.9 Photo exhibition, posters, videos	2 000,00		1	2 000,00	2 000,00
5.10 Publishing of training modules	4 000,00		1	4 000,00	4 000,00
5.11 CD-ROM publication	1 000,00		1	1 000,00	1 000,00
Subtotal Other costs, services	**43 400,00**				**23 300,00**
6. Other					0,00
	0,00		0	0,00	0,00
Subtotal Other	**0,00**				**0,00**
7. Subtotal direct costs of the Action (1-6)	**295 195,00**				**97 036,00**
8. Administrative costs (maximum 7% of 7, total direct eligible costs of the Action)	20 605,00				6 792,52
9. Total eligible costs of the Action (7+ 8)	**315 800,00**				**103 828,52**

ANNEXE 2: ORCATAD, developing a database of exemplary practices in Conservation Agriculture

ORCATAD
Developing a Database of
Exemplary Practices in Conservation Agriculture

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Vientiane, March 2008

ORCATAD - Open Resource on Conservation Agriculture for Trade and Development

ORCATAD (Open Resource on Conservation Agriculture for Trade and Development) is a European Union funded project aiming at promoting conservation agriculture in Lao PDR. In its slipstream it aims to enhance export capabilities. The core of the project consists of the development of a knowledge base of best practices in the field of conservation agriculture. This knowledge base will serve different purposes through the use of ICTs. On the one hand it will be used to improve training and extension services for farmers and farmer groups and on the other hand it will also target at small and medium agro-based enterprises and intermediary business organizations. Partners in the project are the Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD) from France, the National Agriculture and Forestry Research Institute (NAFRI) from Lao PDR and Wageningen University (WU) from the Netherlands.

Under the umbrella of this project, we have been searching for the expertise of different stakeholders such as government officials from the Ministry of Agriculture and Forestry (MAF), staff from NAFRI and NAFES, officials from the Ministry of Industry and Commerce, from extension personnel at the district level, from traders, from communication and ICT specialists and from people working in international organizations such as FAO and the EU. Topics for discussion were appropriateness, content, relevance and use and distribution of such a database.

The database is centralized in the ORCATAD project. This means that the main question is reformulated into questions such as: How can the database be made of relevance to different kind of end-users? How can the content of the database best be structured? How can the same information on best practices be presented and accessed? What is the best entry for each type of end-user? How can the sustainability of the database be secured?

3. Mission and Objective

The database has three missions: 1. to ***conserve information***, 2. to operate through providing a ***pool of educational material***, and, 3. to act as a ***promotional and advocacy tool***.

Therefore, the objective of the database is three-fold. First, it wants to conserve a knowledge base for the agricultural sector at large by presenting a selection of exemplary practices and related materials in conservation agriculture. The second objective is to operate as a pool of educational material to be used by extension service providers and educational institutions operating in the same domain. Third, it also wants the database to be of relevance as a promotional tool in the domain of (international) trade and as an advocacy tool in the domain of policy making (at different levels). Through building upon up-to-date, basic and concerned information it aims to be a promotional tool for traders and an advocacy tool for decision makers. As such it will emphasize issues of sustainability (environmental health, economic profitability and social and economic equity).

4. Specific Target Groups

There are three specific target groups of the database:

4. The first target group consists of extension officers and students in the field of conservation agriculture. The database aims to be of relevance at different levels of education. For general students in agriculture or related disciplines, an overview of basic information and general

description of practices will be sufficient. For extension officers on the other hand it is important that the database not only provides an overview of basic information on exemplary practices, but also provides detailed technical information.

5. The second target group can be found in the commercial sector. The database aims to be used as a promotional tool for marketing purposes. This can also be done in combination with other material, like the films that are going to be produced on different aspects of conservation agriculture. Dissemination of the materials in Laos and the Sub-region of the Greater Mekong can be done in cooperation with the Department of Production and Trade Promotion at the Ministry of Industry and Commerce. The Press and Information Officer of the European Union in Laos also expressed his willingness to help in distributing the CD-Rom with the database.
6. The third target group is the national and international community of governmental and non-governmental organizations operating in the domain of agriculture or related domains. For this target group the database can be used as an advocacy tool. The consequences for the content and the functioning of the database are similar to the consequences for using the CD-Rom as a promotional tool in the commercial sector.

3. Content

The content of the database consists of two main areas and several sub-areas:

- Exemplary Practices and Training Materials
- Related Material
    - Selected bibliographies in several fields of interest
    - Selected set of links to relevant information on the internet
    - Networking in conservation agriculture

3.1. Exemplary Practices and Training Materials

In order to be able to describe the exemplary practices, a set of dimensions for assessing the practices needs to be developed and adopted. Success stories describe practices that are socially acceptable, economically profitable and environmentally sound, and adhere the technical principles of conservation agriculture (permanent soil cover, minimal soil disturbance and crop rotations). However, the database will not only consist of best practices that score high on specific criteria, but will also feature practices that might score high on one dimension and score low on another dimension. This is the reason why the database consists of exemplary practices and not of best practices. The practices are taken from the specific situation in Lao PDR. This does not mean that it could not have any relevance to other countries and regions in the world, but transferring it to another context needs to be done with care.

The selection of the dimensions and the selection of the exemplary practices are guided by the following principles:

- The selection of the dimensions serves an inward looking function as well as an outward looking function. Inward means that the focus is on the quality of life of the farmers and appropriate extension services. Outward means that the focus is on the sector of trade and commerce, policy makers and governing bodies, and the academic and professional communities at large.
- Selection of the exemplary practices will be taken from experiences in the two provinces of Lao PDR; Xieng Khouang and Xarabury.

- The exemplary practices will be selected under the expertise of the staff of NAFRI (PRONAE).
- Exemplary practices will be described in a qualitative way (through descriptive stories). The stories will highlight aspects of the dimensions that are relevant and typical to the particular practice. No sub-criteria will be defined in advance as emphasis will be put on particular characterizing aspects of the selected practices. Each exemplary practice will be accompanied by a so-called 'Quadrangle'-visual, an image that visualizes the scores on the 3 inward looking dimensions (the Quality of Life, Environmental Sustainability, and, the Regulatory Environment and Service Provision) and the 1 outward looking dimension (Commercialization and Advocacy) (see Figure 1.).
- The exemplary practices will also be assessed in a more quantitative way by adding a score on a scale of five on the four dimensions.

The selected dimensions are the following:

- Quality of Life: This dimension is about the sensitivity that a practice has for the improvement of the quality of the life of the farmer and his or her livelihood. The Quality of Life dimension adopts the Sustainable Livelihoods Approach (SLA) as developed by DFID.[1] The quality of life equals a sustainable livelihood and can thus be seen as depending on the different identified capitals. For the purpose of assessing exemplary practices in conservation agriculture on the dimension of quality of life, we have adopted the following capitals as being of relevance: a.) the human capital; b.) the social capital; c.) the physical capital; d.) the natural capital, and e.) the financial capital.
    - Human capital is defined by the OECD as "the knowledge, skills and competences and other attributes embodied in individuals that are relevant to economic activity". (OECD, 1998:9[2]). It refers to the kinds and levels of education needed, to training demands and to required skills and technological knowledge. It also includes health and psychological well-being of the farmer.
    - Social capital is the whole of social relations that are relevant in one way or the other for production purposes. "For the majority of writers it is defined in terms of *networks*, *norms* and *trust*, and the way these allow agents and institutions to be *more effective in achieving common objectives*" (Schuller[3]). It refers to community issues and collective organizational requirements. Issues that are of interest here are for instance: sensitivity to labor inputs and availability of labor, sensitivity to gender (un)balances, and sensitivity to cultural embeddings. Social capital also includes cultural embedding and appropriateness. A new practice can for instance be a continuation of an existing practice or the change to the new practice can be too vast, and the gap between the traditional practice and the new practice can turn out to be too big.
    - Physical capital consists of non-human assets that are made by humans and are required for or used in production activities, e.g. technical equipment. But besides technical equipment, physical capital also includes infra-structural capital, which refers to communication infrastructures, roads, irrigation dams and any physical improvements made to nature.

[1] See for instance: http://www.livelihoods.org/info/guidance_sheets_pdfs/section2.pdf.
[2] OECD (1998). Human Capital Investment: An International Comparison, Paris: Organisation for Economic Cooperation and Development.
[3] www.open.ac.uk/lifelong-learning/papers/393B8E05-0008-65B9-0000015700000157_TomSchuller-paper.doc

- Natural capital refers to water, land, air, plants, etc... This capital is about the potential that nature offers. It is commonly divided into renewable resources (agricultural crops, vegetation, wild life), and, non-renewable resources (fossil fuels and mineral deposits).
- "Financial capital denotes the financial resources that people use to achieve their livelihood objectives" (DFID,). It refers to the availability of cash or equivalents that people apply to improve their livelihood and their quality of life.

The 5 capitals cover the human, inter-human (social), extra-human (man-made artifacts), and non-human (nature) aspects of the quality of life. It is not necessarily so that the larger the capital, the higher the quality of life is. However, it is envisaged that the quality of life is subject to the qualitative existence of these capitals, individually and in relation to each other. The description of the dimension of the 'quality of life' should therefore include reviews of the characteristics of these capitals and score the amount of sensitivity to these capitals – **A high score on this dimension means that the practice has a positive influence on the improvement of the quality of life of the farmers and is thus sensitive to issues related to human, social, physical, and natural capital.**

- Environmental Sustainability: This dimension is about maintaining the qualities that are valued in the natural environment on a long-term basis. To what extent does the practice sustain the environment and conserve agricultural diversity? To what extent are the production techniques environmentally sound? To what extent does the practice have a positive result on the maintenance of biodiversity and the totality of the eco-system? To what extent does the practice promote the natural functioning of the eco-system? Good integrated management aims to maintain enough diversity to allow interesting eco-systemic properties to emerge. – **A high score on this dimension means that the practice scores high on maintaining the natural eco-system and promoting the natural functioning of the eco-system.**

- Regulatory Environment and Service Provision: This dimension is about the availability of a supportive political climate and regulatory environment. It also includes the availability of rural services; extension services and other support services. To what extent is the political and regulatory environment supportive to the practice? Is the practice appropriate and does it fit into the existing environment? Issues of concern are for instance: the political environment; regulation; market access; taxes; the financial context; credit provision; reasonable pricing; effective extension support; facilitating marketing…[4])? Does the government enable a positive environment? – **A high score on this dimension means that the regulatory environment is supportive towards the practice and that rural services are appropriate and in place.**

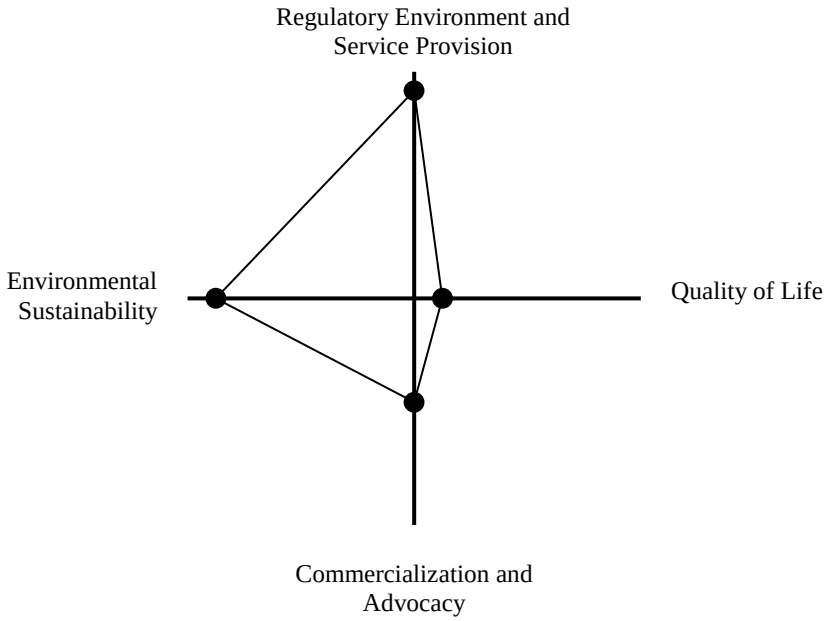
- Commercialization and Advocacy: This dimension is of a different nature than the three dimensions identified earlier. It measures the potential that a practice has for trade and advocacy. It captures the 'market outlook' of a practice by identifying characteristics of the practice that have high marketing potential, and thus high economic potential. These characteristics can come out of the above mentioned three dimensions, a combination of these three dimensions, or from a totally different field of operation of the practice. A

[4] QAMAR, M.K. (2007). Agricultural Technology Management, Transfer and Commercialization: An Overview with Focus on Asia-Pacific Region, paper presented at the International seminar, "Best Practices in Agricultural Technology Transfer", held from 5 to 9 November 2007 at Colombo, Sri Lanka, organized by the Asian Productivity Organization, Tokyo in collaboration with the Ministry of Agriculture Development and the National Productivity Secretariat, Sri Lanka.

practice could for instance perfectly fit into the discussion on the establishment of a new 'good for development'-label[5], or it could nicely fit within existing trade relations… – **A high score on this dimension means that the practice has (a) characteristic(s) that ha(s)ve high potential for use in (social) marketing.**

Below you will find an example of how the scores on the different dimensions can be visualized in a quadrangle.

Fig 1. Example of a Quadrangle



In this example the selected practice scores high on the dimensions of environmental sustainability and the regulatory environment is supportive towards the practice. Moreover, the service provision to the practice is appropriate and in place. However, the particular practice scores low on the dimension of improving the quality of life for the farmers. This could mean for instance that the practice requires labor that is too hard for the farmers (human capital) or that the community is not ready to adopt the practice (social capital).

Training Materials

The database will include a listing and descriptions of the training materials linked to the exemplary practices. The goal is to have most training material available in 3 languages: Lao, French and English. Currently, most material is available in Lao and French, not in English.

3.2. Related Materials

Bibliographies

The bibliographies are in development. They cover the following (sub)areas:

[5] ELLIS, K. & WARNER, M. (2007). Is the Time Ripe for "a Good for Development" Product Label?, ODI Opinion Paper, October. (http://www.odi.org.uk/IEDG/Business_Development_Performance/Papers/ODI_op88_Good_for_Development.pdf)

- Conservation Agriculture
- Communication, Education and Trade
    - Communication, Innovation and Development
    - Extension, Training of Farmers and Farmer Field Schools (FFS)
    - ICTs (incl. open source) and (Agricultural) Development
    - Trade

Relevant information on the internet
The idea is not to have as much links as possible to relevant information on conservation agriculture to be found on the internet, but to have a selected list of quality, trusted and sustainable resources.

Networking
The database will also include basic information on organizations working in the area of conservation agriculture and provide information on main conferences and other meetings. Examples are: the Southern Conservation Agricultural Systems Conference (SCASC) (http://www.ag.auburn.edu/auxiliary/nsdl/scasc/); World Congresses on Conversation Agriculture (see for the 3rd congress: http://www.act.org.zw/congress/index.htm); Latin American Network of Conservation Tillage (RELACO) (http://www.fao.org/ag/ags/AGSE/6to/relaco/sld001.htm); The Conservation Technology Information Center (CTIC) (http://www.conservationinformation.org/?action=about)…

4. Entering the Database

The database will have two different possibilities for accessing the database. One for extension officers, students and other users who already have at least a basic knowledge of conservation agriculture and are interested in the database as an educational tool. The other entry should be for policy makers, traders, the general public and other users who have no or very limited knowledge about conservation agriculture. Here the database should function as a promotional and advocacy tool.

Database Conservation Agriculture
Training & Education
Promotion & Advocacy

The sub-structure for entering the information as a consumer of the database is under development. An existing idea is to enter the database by clicking on the link “Promotion and Advocacy” through kinds of agricultural products (maize, ricebean, pigeon pea…) and then linking through to the dimensions of commercialization and advocacy that are linked to the product. A possible structure for entering the database as a pool of training and educational material is through the first three dimensions, the material itself and related materials. As a sub-menu it looks as follows:

Promotion & Advocacy	Training & Education
maize ricebean pigeon pea livestock … listing of exemplary practices	quality of life environmental sustainability regulatory environment and service provision training material related materials listing of exemplary practices

Training & Education

Let us say you are a Bachelor student in agriculture, then you get the following screen when you click on "quality of life":

Quality of Life

Dimension of Quality of Life
(Ranking)
Score 5
- Practice A
- Practice B
- Practice C
- …

Score 4
- …

Score 3
- …

Score 2
- …

Score 1
- …

If you then click for instance on Practice A, you get the following screen:

Practice A

<general description of the practice> <+ quadrangle>

Dimension of Quality of Life
<description of the dimension>

Links to Other Dimensions
- Link to dimension 1

- Link to dimension 2
- Link to dimension 3

Training Materials

Promotion & Advocacy

Let us say you are a trader and you click on maize, then you get the following screen:

Maize

What does it mean to produce maize in a sustainable way?
<general description of how the product is produced using conservationagricultural techniques>

Dimension of Commercialization and Advocacy
(Ranking)
Score 5
- Practice A
- Practice B
- Practice C
- …

Score 4
- …

Score 3
- …

Score 2
- …

Score 1
- …

If you then click for instance on Practice A, you get the following screen:

Practice A

<general description of the practice> <+ quadrangle>

Dimension of Commercialization and Advocacy
<description of the dimension>

Links to other Dimensions

- Link to dimension 1
- Link to dimension 2
- Link to dimension 3

Training Materials

5. Sustainability of the Database

Monitoring, evaluating and updating
It is proposed to evaluate the database after a period of three years and decide if the information is still of relevance and the database still meets its objectives. It can then also be decided if the database needs to be updated. No updates in the first three years after the release are planned, however if means are available we could update the database on a regular (maybe yearly) basis.

Connecting the database to the existing communication infrastructures

- As an integral part of AKIS -
  In order to become sustainable the database must find a relevant and efficient position amongst the existing Agricultural Knowledge and Information System. One should be aware of not creating a parallel system of knowledge and information.
- As a promotional tool for traders and an advocacy tool for decision makers -
  Sustainability of a promotional tool is hard to predict. It highly depends on fluctuation in the markets.

6. Going for an Internationally Certified Database

We also discussed the establishment of a Committee on Certification, especially for the selection of the exemplary practices in conservation agriculture.
Members of the Committee of exemplary practices in conservation agriculture could be the following people:

- 1 specialist from CIRAD
- 1 specialist from Wageningen University
- 1 specialist from FAO
- 2 specialists from Laos (or Great Mekong Sub region)

7. Going (also) for Open Source

“Going for open source” means in the case of ORCATAD, making the database accessible through non-proprietary means. Unlike Windows, the best known proprietary software (the opposite of Open Source Software) that was developed by the Microsoft Cooperation, Open Source Software (e.g. Linux) is free in the sense as mentioned below.

Free Software, Open Source Software and Libre Software are confusing terms for those who are not familiar with software development as most of the end-users are. Underneath the wings of the World Summit of the Information Society (WSIS), the Free Software Foundation (FSF) Europe produced a document to clarify the concepts (FSF Europe, 2003[6]). This document first of all makes it clear that it is important to understand that Free in Free Software is referring to freedom, not to costs. Quoting one of the first documents that defined Free Software the following four freedoms are referred to: 1.) the freedom to run the program for any purpose, 2.) the freedom to study how the program works, and adapt it to your needs, 3.) the freedom to redistribute copies so you can help your neighbor, and, 4.) the freedom to improve the program, and release your improvements to the public, so that the whole community benefits.

The term Open Source is in fact a term that was introduced in the late 1990s to market Free Software. The term Open Source is less value loaded and was introduced to promote the type of software by using primarily the technological features and not the ideology of freedom that is implicitly associated with the use of the term Free Software. Libre Software is then a third term for the same and was introduced by the European Commission to avoid the ambiguity of the English word Free Software and to end misunderstandings with the term Open Source Software. Open Source Software is therefore not per definition free of charge (although some of it is), but basically tries to break through Microsoft's global monopoly by introducing competition (and cooperation) again.

ORCATAD can best incorporate the ideas of 'open source' by adhering the ideas of freedom as mentioned above. In concrete terms this might mean producing a web based version that is accessible with a Firefox browser and designing a stand alone LINUX version.

8. Going for a Strategic Location of the On-Line Database

Connecting the database of exemplary practices in conservation agriculture to the website of NAFRI seems the most logical option for positioning the database. It emphasizes the research component of the enterprise and profits from the established position of NAFRI in Laos. The NAFRI website is well developed and incorporates already a database consisting of documents relevant to agriculture in Laos (LAD - Lao Agricultural Database http://lad.nafri.org.la/lad/index.html). The NAFRI website could as such well develop into a focal point for exemplary practices in the area of conservation agriculture. Setting up a completely new website for the database is not desirable as it might become too isolated.

Going for a CD-Rom too

The database will be published on a CD-Rom too. This CD-Rom publication is of interest to extension officers working in agricultural areas where there is no or slow access to the internet. The second goal of the CD-Rom version is to have a promotional tool with a glossy look, but consisting of quality information.

Selection of Existing Databases in the Field of Agriculture

[6] FSF Europe (2003). Free Software (a.k.a. "Libre Software" or "Open Source"), Free Software Foundation Europe (http://fsfeurope.org/projects/wsis/fs.html, last accessed: 4 March 2008).

IReNe – Agriculture, Forestry and Fisheries
Database of **I**ntellectual **Re**sources and **Ne**eds in the areas of Agriculture, Forestry and Fisheries
http://irene-db.org/aff/index.php
(You can search with the key word "conservation agriculture (sustainable agriculture)" – found 31 entries on 3 March 2008)

Conservation Agriculture Technology
The database concentrates on equipment and machinery for manual, animal or motorized operation which has been specially designed for the needs of Conservation Agriculture.
http://www.fao.org/ag/catd/

LAD – Lao Agricultural Database
http://lad.nafri.org.la/lad/index.html
The Lao Agriculture Database is the first on-line system to collect Lao agriculture and forestry reports and materials in both the Lao and English Languages. LAD has been established by the National Agriculture and Forestry Research Institute (NAFRI) in collaboration with the Thai AGRIS Center, Library of Kasetsart University (Thailand) to improve the collection and dissemination of agriculture and forestry related information in Laos. The system is based on the AGRIS system of FAO. The database includes research results, surveys, training and extension materials, working papers, as well as policy and strategy reports. The database consists of bibliographic information, abstracts and to a limited extent, full text digital files.

Pakistan Agriculture Database
http://www.parc.gov.pk/data/CatPak/catalog.asp
Database containing bibliographic information of literature published in Pakistan or elsewhere in the world about Pakistan agriculture. It is facilitating the scientists to identify, locate, and use research literature. From 1997, abstracts have also been added. Total records in the database are more than 53,000.

Betuco – Documents on Conservation Agriculture
http://www.betuco.be/Eng/ca_doc-eng.htm
Listing of many documents on conservation agriculture.

EarthTrends – The Environmental Information Portal – Agriculture and Food
http://earthtrends.wri.org/searchable_db/index.php?theme=8

9. Selection of Related Projects and Websites

Conservation Agriculture
http://www.fao.org/ag/ca
Website of FAO on conservation agriculture

Conservation Agriculture Portal
http://www.fao.org/ag/agl/agll/prtcons.stm
Conservation Agriculture Portal of the FAO

Supporting Conservation Agriculture for Sustainable Agricultural and Rural Development (Phase II)

http://www.nrsp.org/database/project_view_print.asp?projectid=485
Tanzania and Kenya, project period: 07/05/2007 to 14/05/2010

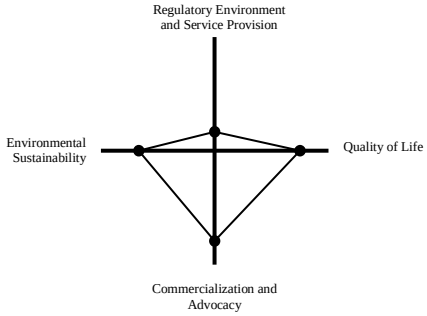
Knowledge Networking for Rural Development in Asia/Pacific Region
http://www.enrap.org/

Lao Extension
http://laoex.org/

NAFRI - NAFES
http://www.laolink.org/

10. Examples of Database Entries

Improved Pastureland and Cattle Fattening Opportunities on the Plain of Jars (Xieng Khouang)



On altitude plains in Xieng Khouang, large areas of savannah grasslands are "under-utilized" by smallholders with main farming systems based on lowland paddy fields, livestock production with extensive grazing on savannah grasslands and off-farm activities. This ecology represents at least 60,000 ha on three districts (Pek, Phoukhouth and Phaxay).
Improved pastureland is established using no-till technologies (no ploughing, no burning) and the main forage specie used is *Brachiaria ruziziensis* well adapted to acid soils. Native grasses (*Themeda* sp., *Cymbopogon nardus*, *Hyparrenhia* sp.) are controlled by spraying systemic herbicide (Roundup, 3 to 4l/ha) one month prior the sowing. Organic (thermophosphate) and mineral (urea and KCl) fertilizers are broadcasted before sowing (thermophosphate and KCl) and during the rainy season (urea, KCl).

Dimension 1. Quality of Life

Specific training is needed to start this system based on the establishment of improved pastureland. However, farmers have the required skills and technical knowledge to become rapidly independent in establishing new fields and in managing cattle in existing pastures (cattle grazing managed in blocks to allow good forage growth and appropriate fertility management). Low labor input is required to establish pastureland, but equipments (hand tractor, sowing machine, and sprayer) are needed to conduct these activities; they can be shared by several families. However, animals' management required reasonable labor for animals' care and daily water provision.

This system requires initial investment to establish pastureland (fencing, land preparation, seeds, and fertilizers) and to conduct cattle fattening activities (young cattle stock of the family and/or possibility to buy cattle). Infrastructures (equipments) and financials are the more constrained capitals. Credit is essential in this system.

No-till system showed very promising results allowing the use of new lands on the Plain of Jars, increasing the productivity of such lands, and generating new incomes. Forage seed harvesting is the only activity performed during this first season and cattle fattening activities started the second year in order to allow a good establishment of the pasture the first year. Five young cattle

can be fattened per hectare and an average farmer can get a net income of 300 USD (not including seed production).

Process of land allotment has been conducted by communities in different villages where such systems have been promoted. This change from community land management to individual land management has positive and negative impacts. Positive in generating new incomes and increasing the productivity of the land allowing in the near future crops diversification as rice. Negative impact if the land "allocation" is not well distributed (equitable access to land) between members of the same community creating social conflicts.
This system scores high (4) for this criterion due to new land accessibility, generating new commercial opportunities, and increasing incomes. Main constraints are based on infrastructures and financial capitals particularly availability for mechanization and cattle or the possibility to access to credit to buy animals and equipments.

Dimension 2. Environmental Sustainability

The soil is not disturbed by mechanical action while land preparation is based on direct sowing of forage species after control of natural pasture land. Before sowing, in order to control native grasses, herbicide (glyphosate) is used and mineral fertilizers (urea and KCl) are broadcast allowing good establishment of the forage specie. Thermophosphate is classified as organic product.

This system improves soil fertility in a broad sense: physical (bulk density, soil permeability and aggregate stability), biological (soil diversity) and chemical (increase of soil organic matter and stock of organic carbon) characteristics. Use of living fences increase flora (multipurpose species) and fauna (insects, birds) diversities.

This system scores medium (3-4) for this criterion.

Dimension 3. Regulatory Environment and Service Provision

Animal fattening is clearly related to market access and meat demand. Rural areas of Laos have traditionally struggled to find markets for products because of low population density and poor transport links. However, Xieng Khouang province has begun to show a high commercial rate of cattle export to Vietnam (Onekeo, 2005; Syphanravong et al., 2006) and the recent experiences of the Forage for Smallholders Projects (CIAT-NAFRI) and the Small Scale Agro-enterprise Development in the Uplands (SADU-CIAT) show increasing commercial opportunities in places where smallholders are growing forages for cattle feeding. However, market chain has to be improved; traders raise that administrative format and tax contributions have to be simplified to enhance commercialization between districts, provinces and Vietnam.

The local ecologies on schist and granite present good physical properties but low mineral contents (Hacker et al, 1998) with high deficiencies of N, P, K, Ca, Mg and micronutrients (Zn, Bo, Mn). Thermophosphate addition is thus essential, providing reasonable quantities of Ca, Mg and P and allowing implementation of efficient livestock production and cropping systems. A market channel for such fertilizers has been organized by PRONAE in Xieng Khouang province through Vietnamese traders, but this channel is not already operational to scale-up this system.

Moreover, specific equipment adapted to local economic conditions (sowing machine for hand-tractor) must be promoted to decrease labor inputs for land preparation and sowing. The other limiting factor is that the system is perceived as requiring an initial cash investment and credit access is essential.

Promising results have been recorded in producing forage seeds for *Brachiaria* species. Development of specific market channels for seeds could indirectly improve pasture management, avoid high stocking rates and generate new income that could be invested in fertilizer and animal care. The Lao National Agro-Ecology Programme (PRONAE) started promoting forage seed production and the Small Scale Agro-enterprise Development in the Uplands (SADU-CIAT) initiated some activities in designing and facilitating the implementation

of agro-enterprise.

On these high plains, innovative farming systems based on direct mulch-based cropping and better integration of livestock and cropping activities could be stable and profitable if, at the same time, economic incentives (access to market, inputs, credit, agriculture equipments and livestock product processing) are promoted.

To conclude this system scores very low (1) for this criterion due to the absence of environment structuring: lack of credit access, inputs, specific equipments, and technical supports from extension agencies.

Dimension 4. Commercialization and Advocacy

Pastureland improvement and no-till system show very good results (reducing production costs and land erosion) on the Plain of Jars and could be extended to staple (rice), cash (maize, soybean), and niche crops (sesame, buckwheat) production.

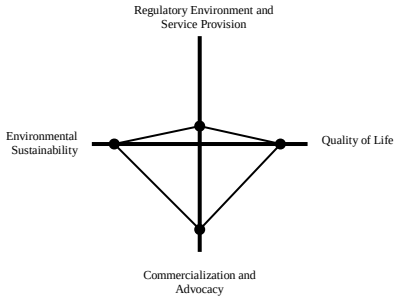
In conclusion, despite positive economic and technical results with cattle fattening, a global approach involving credit access plus technical and political support has to be defined if productive and efficient systems are to develop in this ecology. This poses a great challenge which, if grasped, could yield great benefits in the upper part of the Nam Ngum river basin.

This system scores high (4) for this criterion due to its potential for commercialization and being a good example of advocacy for donors and policy-makers.

Training Materials

<<to be filled>>

Rainfed Rice, Improved Pastureland and Cattle Fattening Activities on the Plain of Jars (Xieng Khouang)



Several options are available for farmers to regenerate and open new lands on the ecology of the Plain of Jars. The first step is based on direct sowing of forage species to conduct cattle fattening activities and to eventually regenerate soils for annual cropping (see previous system). The second system is to associate rice and forage specie to produce a staple crop for farmer and to establish, the same year, pastureland for livestock activities. This system differs from the previous one only by this association between rice and *Brachiaria ruziziensis*; all others technical operations are identical.

Dimension 1. Quality of Life

No-till system showed very promising results allowing the use of new lands on the Plain of Jars, increasing the productivity of such lands, and generating new incomes for the families. This association has positive trait regarding crop diversity and income generation on an ecology generally used for extensive grazing and lowland paddy. Direct benefits of this first season are i) rice and ii) forage seed production which can be sold to other farmers in the village. For the coming seasons, incomes are generated by cattle fattening activities that can be conducted indifferently by man or woman.

Specific training is essential to implement this system. However, human capital, as skill and knowledge, is available to implement such system. Main labor inputs concern rice harvesting and other cultural operations as land preparation and sowing requires low labor if specific equipments are available as sowing machine and sprayer.

Process of land allotment has been conducted by communities in different villages where such systems have been promoted. This change from community land management to individual land management has positive and negative impacts. Positive in generating new incomes and increasing the productivity of the land, but negative impact if the lands are not well distributed (equitable access to land) between members of the same community creating social conflicts.

The main constraints of this system are linked to the infrastructures and financial capitals and the needs for:

- Specific direct sowing machine for tractor or hand-tractor to sow rice and forage specie,
- Specific short cycle rice cultivar in order to complete his cycle before the total establishment of the forage specie which becomes very competitive for nutrients, water and light energy,
- Cattle availability.

This system scores high (4) for this criterion due to new land accessibility, generating new commercial opportunities, and increasing incomes.

Dimension 2. Environmental Sustainability

The soil is not disturbed by mechanical action while land preparation is based on direct sowing of forage species after control of natural pasture land. Before sowing, in order to control native grasses, herbicide (glyphosate) is used and mineral fertilizers (urea and KCl) are broadcast allowing good establishment of the forage specie. Thermophosphate is classified as organic product.

This system improves soil fertility in a broad sense: physical (bulk density, soil permeability and

aggregate stability), biological (soil diversity) and chemical (increase on soil organic matter and organic carbon) characteristics. Use of living fences increase flora (multipurpose species) and fauna (insects, birds) diversities. This system scores high (4) for this criterion.

Dimension 3. Regulatory Environment and Service Provision

As described previously the main constraints are related to:

- Low soil fertility and the necessary use of organic and mineral fertilizer. Market chain has to be organized at the local level between Vietnamese traders and local providers,
- Access to specific equipments as sowing machine and sprayers and inputs (forage seeds and herbicides),
- Access to credit provisions to buy inputs, equipments and cattle.

Extension officers have to give technical support and information to smallholders regarding the choice of forage species and rice cultivars.

On these high plains, innovative farming systems based on direct mulch-based cropping and better integration of livestock and cropping activities could be stable and profitable if, at the same time, economic incentives (access to market, inputs, credit, agriculture equipments and livestock product processing) are promoted.

This system scores very low (1) for this criterion due to the absence of environment structuring: lack of credit access, inputs, specific equipments, and technical supports from extension agencies.

Dimension 4. Commercialization and Advocacy

This ecology has a great potential for agricultural productions and the promotion of this system is directly related to political decisions and the recognition to invest in this location and in this alternative to improve livelihoods and to generate new commercial opportunities at the provincial level.

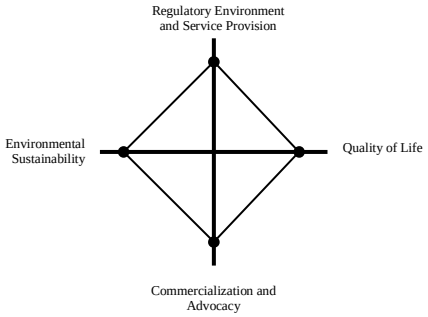
Opening new rainfed areas for rice production on a small-scale basis is a great challenge that could benefit the entire population of the province. The cost of this operation will be low regarding funds invested on lowland paddy fields infrastructures on the Plain of Jars which are globally unused due to the low soil potentiality, lack of alternatives during the dry and cold season, and poor social management of the irrigation network.

This system scores high (4) for this criterion and particularly as a good example of advocacy for donors and policy-makers.

Training Materials

<<to be filled>>

Maize Production under No-Till System and Intercropping with Rice-Bean (Southern Xayabury)



Over the past fifteen years, farming systems have changed drastically in Laos, with swidden systems giving way to more modern agricultural technologies in many areas. In southern Xayabury, traditional systems have collapsed, with a transition from subsistence agriculture to intensive cultivation of cash crops, led by the demands of the Thai market. Notable changes in agricultural practices have included the adoption of heavy mechanization and use of pesticides. With the support of local traders, maize is now widely sown throughout the region and is spreading to more areas every year. With agricultural intensification, rotational cultivation systems and fallow periods are disappearing, being progressively replaced by a 'resource-mining' agriculture that has serious social and environmental costs, including increased soil erosion (leading to destruction of roads and paddy fields), loss of soil fertility, and chemical pollution of the environment. In view of this situation, the Lao National Agro-Ecology Programme (PRONAE) is implementing an iterative research-development approach oriented on Conservation Agriculture to find innovative systems to revert, the present resource-mining practices in southern Xayabury into no-till system based on permanent soil cover, no soil disturbance, crop rotations and use of relay/cover crops.

Many systems are actually under adoption and validation process by farmer groups. The system described hereafter refers to the intercropping of rice-bean with maize. Maize is commonly sown at the beginning of the rainy season from end of April to mid of May and rice-bean is intercropped in August when maize leaves become senescent and sunshine is sufficient to allow this additional crop to germinate. Maize is commonly harvested in September and rice-bean in earlier December. Rice-bean is also one of the main cash crops commonly used since several decades by smallholders. This system is promoted mainly in Paklay and in some locations in Kenthao districts where farmers produce maize every year due to good soil potentiality and where is very difficult to promote rotational sequence.

Dimension 1. Quality of Life

No-till system for maize production and intercropping with rice-bean showed promising impacts on quality of life, particularly in:

- Reducing production costs for land preparation (ploughing),
- Increasing labor productivity and net income,
- Reducing labor inputs particularly for sowing and manual weeding,
- Reducing greatly the use of herbicide for land preparation and weeds management during maize cycle due to the good weed competitiveness of rice-bean,
- Reducing contact for man, woman and child with seed coated with insecticide using sowing machine,
- Increasing spatial and temporal crop diversity (maize + rice-bean, the same year on the same field),
- Maintaining and improving soil fertility.

Higher income is generated with this system due to soil improvement and better weed control. Rice-bean contributes also to this income even if the yield is relatively low due to late sowing in the season.

However, in order to prevent grazing of rice-bean at the beginning of the dry season, to preserve residues and cover crops during the dry season (problems with wild-fires and cattle grazing), modification of collective land management have to be defined and accepted by the community. These social changes occurred in some locations and are under discussions in others villages. This process should be iterative and conducted by the own community to avoid conflicts between

farmers and between farming components (annual cropping and livestock).

This system scores high (4) for this criterion due to several aspect presented above and to the reduction in use of herbicides.

Dimension 2. Environmental Sustainability

This no-till system and cropping sequence based on maize and rice-bean intercropping presents several positive traits: i) improvement of soil fertility (physical, biological and chemical) and biodiversity, ii) participate to carbon sequestration, and iii) reduce weed pressure by biological control (integrated management of weeds through shade and reduce use of herbicide). Locations where rice-bean is very well established allowed to avoid use of herbicides at the beginning of the rainy season. Thus, this system scores high (4) for this criterion.

Dimension 3. Regulatory Environment and Service Provision

In southern Xayabury since several decades cropping is mainly based on cash crops production as maize, rice-bean, sesame, Job's tears and peanut. In this region, farmers have good access to market, to credit and inputs due to efficient provider's network for sale and supply.

However, regulation and modification of community land management during the dry season would be useful to preserve, as much as possible, residues on the field for the coming cropping season and to improve the integration between cropping and livestock components.

Access to specific equipments, as sowing machines for hand-tractor and hand-jab seeder to intercrop rice-bean with maize, is necessary to improve the dissemination and adoption of this system.

Even if regulations have to be integrate regarding credit (mainly done by traders with high interest rates) and collective land management, we conclude that this system scores high (4) for this criterion due to the actual situation characterized by a high level of commercial commodities.

Dimension 4. Commercialization and Advocacy

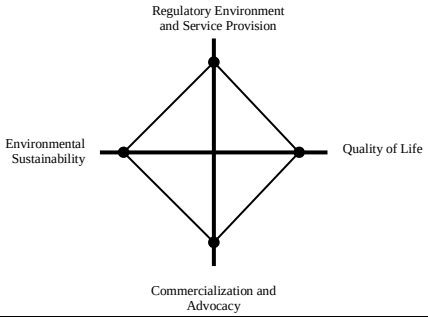
This system is a good example of advocacy for policy-makers scoring high for the quality of life, environmental sustainability and regulatory environment. On the other hand the potential for commercialization is also high due to the fact that this commercial product could be in the near future producing under organic management.

Training Materials

<<to be filled>>

Maize Production, No-Till System and Crop Rotation (Southern Xayabury)

The system described hereafter refers to a rotational sequence between maize and rice-bean under no-till systems and residues management. This system has been widely adopted by farmers in Botene district to decrease the risks related to the soil potentialities (low soil fertility and low water retention capacity due to sandy soils).



Dimension 1. Quality of Life

No-till system for maize production and rotational sequence with rice-bean showed promising impacts on quality of life, particularly in:

- Reducing production costs for land preparation (ploughing),
- Increasing labor productivity and net income,
- Reducing labor inputs particularly for sowing and manual weeding,
- Reducing greatly the use of herbicide for land preparation and weeds management during maize cycle due to the good weed competitiveness of rice-bean,
- Reducing contact for man, woman and child with seed coated with insecticide using sowing machine,
- Maintaining and improving soil fertility.

The main difference with the previous system is based on farmer' strategy related to soil fertility, climatic and economic risks in producing maize every year (intercropped with rice-bean) or in having a rotational sequence between two main crops. Market price of rice-bean can be erratic one year from another one and productivity is susceptible to rainfall distribution in September and October. Usually, farmer who adopt this rotational sequence are located on sandy soil (botene) or in degraded areas (southern kenthao) where cropping maize every year is not highly profitable.

However, in order to preserve residues and cover crops during the dry season, modification of collective land management have to be define and accept by the community. These changes occurred in some locations and are under discussions in others villages.

This system scores high (4) for this criterion due to several aspect presented above and to the reduction in use of herbicides.

Dimension 2. Environmental Sustainability

This no-till system and cropping sequence based on maize and rice-bean sequence presents several positive traits: i) improvement of soil fertility (physical, biological and chemical) and biodiversity, ii) participate to carbon sequestration but less than maize + rice-bean system, and iii) reduce weed pressure by biological control (integrated management of weeds through shade). Thus, this system scores high (4) for this criterion.

Dimension 3. Regulatory Environment and Service Provision

In southern Xayabury since several decades cropping is mainly based on cash crops production as maize, rice-bean, sesame and peanut. In this region, farmers have good access to market, to credit and inputs due to efficient provider's network for sale and supply.

However, regulation and modification of community land management during the dry season would be useful to preserve, as much as possible, residues on the field for the coming rainy

season and to improve the integration between cropping and livestock components.

Access to specific equipments, as sowing machine for hand-tractor, is necessary to improve the dissemination and adoption of this system.

Even if regulations have to be integrated regarding credit (mainly done by traders with high interest rates) and collective land management, we conclude that this system scores high (4) for this criterion.

Dimension 4. Commercialization and Advocacy

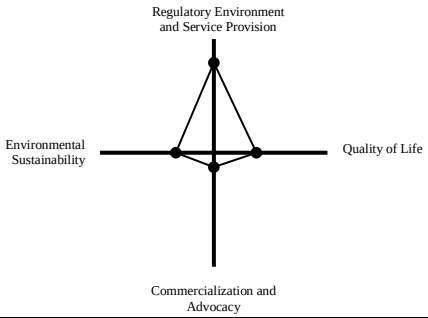
This system is a good example of advocacy for policy-makers scoring high for the quality of life, environmental sustainability and regulatory environment, it scores 4.

Training Materials

<<to be filled>>

Maize Monoculture in Southern Xayabury

PRONAE followed an iterative process to promote not-till systems in this region. Regarding conventional land management based on ploughing, burning of residues and use of herbicide, the first step was to modify the land preparation shifting from mechanical action to no-till system and residues management of the former crop.



Dimension 1. Quality of Life

Positive traits of no-till system and residues management for maize production are:

- Reduction of production costs for land preparation (ploughing),
- Increasing labor productivity and net income,
- Reduction of land erosion,
- Reduction of labor inputs,
- Reducing contact for man, woman and child with seed coated with insecticide using sowing machine.

However, this no-till system is incomplete regarding the main functions provided by *Conventional Agriculture*. Weed control is not efficient due to the absence of crop rotations and use of herbicide tends to increase with years increasing risks of environmental pollution and intoxication of farmers by misuses. This system is clearly not a solution on medium and long-term processes and should be only considered as a first step to promote no-till systems, rotational sequence and use of cover crops. The main constraint refer to the infrastructures capital and the needs of specific equipments to reduce labor requirements for land preparation and sowing.

This system scores medium (2-3) for this criterion due to positive but also negative traits on medium-term process.

Dimension 2. Environmental Sustainability

This no-till system based on maize monoculture can be described as follow:

- Reduction of land erosion but inefficiency of this system to control soil erosion,
- Increase use of herbicides due to maize monoculture and risks of soil and water pollution,
- Low soil improvement due to low level of dry matter input.

Thus, this system scores medium (2) for this criterion.

Dimension 3. Regulatory Environment and Service Provision

In southern Xayabury since several decades cropping is mainly based on cash crops production as maize, rice-bean, sesame and peanut. In this region, farmers have good access to market, to credit and inputs due to efficient provider's network for sale and supply.

Access to specific equipments, as sowing machine for hand-tractor is necessary to improve the dissemination and adoption of this system.

Even if regulations have to be integrate regarding credit (mainly done by traders with high interest rates) and access to equipments, we conclude that this system scores high (4) for this criterion.

Dimension 4. Commercialization and Advocacy

This system is not a good example of advocacy for decision-makers or potentialities for commercialization and this system scores low (1) for this criterion.

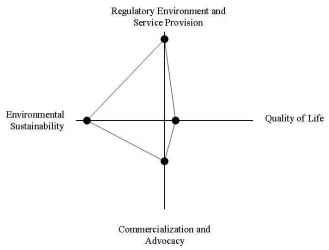
Training Materials

<<to be filled>>

11. Database Form

<Title of the Exemplary Practice>

General description of the practice (includes for example geographical location, date of first implementation, status of the implementation of the practice, kind of agricultural end products…)



Dimension 1. Quality of Life

Dimension 2. Environmental Sustainability

Dimension 3. Regulatory Environment and Service Provision

Dimension 4. Commercialization and Advocacy

Training Materials

ANNEXE 3: Developing a knowledge base in Conservation Agriculture in Lao PDR, 2008 - 2009

1. Context[7]

Conservation Agriculture (CA) has been introduced in Lao PDR since 2003 in the framework of research and extension activity funded by the French Cooperation. Activities in the field of CA have been initiated by the National Agriculture and Forestry Research Institute in Xieng Khouang and in southern Xayabury in 2003 with the start of the Lao National Agroecology Programme (PRONAE). In 2006, PASS – PCADR, started extension activities on this topic promoting no-till systems in the southern Xayabury. Trough an iterative and integrative approach, a closed partnership has been established between PASS and PRONAE based on the generation of innovative systems, validation and extension of no-till systems integrated with livestock components, training of the stakeholders, monitoring and evaluation, identification of financial mechanisms to sustain this dynamic under the current framework of governmental agencies…In parallel, NAFRI and PRONAE have tried to develop partnership with others development projects as Nam Ngum River Development Sector Project.

Since 2005, the PCADR program, through two of its interlinked components (PRONAE and PASS) is working toward increasing the capacity of the Lao institutions to carry on research and extension activities related to Conservation Agriculture. NAFRI and CIRAD are the main scientific partners to this activity, and are providing Technical Assistance for the implementation of PRONAE.

Activities related to Conservation Agriculture are also benefiting currently in Lao PDR from:

- The PROSA: AFD funded Program, hosted by the Ministry of Agriculture and Forestry and providing Technical Assistance (1 CIRAD expert) as well as the necessary financial means to develop a National strategy for Conservation Agriculture in Lao PDR.
- The PAMPA: two sentences (PAMPA is an AFD/FFEM/MAE funded program giving supports to projects and agencies involved in CA under the network of the French Cooperation).
- ORCATAD: two sentences (ORCATAD is an EU funded project).
- Lao Extension Agriculture Project (NAFES/LEAP, SDC funded project) involved on the implementation of a Lao extension approach, production of extension materials…

As PCADR program is touching to an end in 2009, a comprehensive capitalization process is necessary in order to capture and analyse the experience in Conservation Agriculture in Lao PDr, produce scientific, technical as well as communication documents adapted to various audiences: farmers, extensionist, practitioners, and researchers as well as decisions makers.

As conservation agriculture is promoted through various sources of funding in Lao PDR, it is proposed:

- 1 : to have a single and common capitalization plan/strategy
- 2 : to base the capitalization process on the means (human and financial) available at the level of different projects/programs

[7] Many references in this document (developing a database, set of dimensions) are stemmed from the work conducted by Dr. Rico Lie (Wagenigen University, Communication and Information Studies) in March 2008 in supporting NAFRI for the development of a knowledge base in Conservation Agriculture (CA) through ORCATAD project (Open Resource on Conservation Agriculture for Trade and Development, EU funding). ORCATAD is a European Union funded project aiming at promoting conservation agriculture in Lao PDR.

2. Rationale and Objectives

After four seasons (2005-2008) and anticipating the phasing out (in mid-2009) of the main program promoting Conservation Agriculture in LAO PDR , the Ministry of Agriculture and Forestry places as a priority the development of a knowledge base in Conservation Agriculture (CA) as an output of a comprehensive process of capitalization on Conservation Agriculture.

The capitalization process on Conservation Agriculture will have four main dimensions:

1. Collecting and analysing the results of the experiences in Conservation Agriculture.

2. Elaborating in a collaborative way a set of knowledge documents (papers, media, extension tools, scientific papers, policy notes...) adapted to various audiences.

3. Organizing communication events and dialogue in order to interact with various audiences (promotion and advocacy). A particular attention will be given on organizing interaction with decision and policy makers at various levels in Lao PDR, in line with the main objective of the PCADR and PROSA programs ("supporting the elaboration or rural development policies/strategies based on experience").

4. Preserving knowledge and information on the long run.

The capitalization Strategy and Plan is developed in this document. Objectives, means mobilized, methodologies are exposed as well as the main outputs expected

It is considered in the current approach that the main outputs of the Capitalization process will aggregate into a "**knowledge base of systems and practices**" in the field of conservation agriculture. This knowledge base will serve different purposes and will be accessible through the use of ICTs[8] (website, data base, DVD, VCD, and CD-Rom).

3. Collecting and analysing the results of the experiences in Conservation Agriculture

3.1 Information already existing:

Several initiatives have already been taken in order to monitor and collect first hand information on the results of the experiences developed in Conservation Agriculture, as well as on the evolution of the operating context.

a) The PASS monitoring and evaluation system

b) "Monitoring and Evaluation", Farming system changes in Sayaburi province. Powerpoint presentation. 43 p. This document (based on more than 900 household interview conducted in 2006, and updates of the annual M&E system) is providing primary and secondary data on: land use evolution, evolution of land preparation costs, evolution of costs of and use of inputs, evolution of crop diversification, dissemination of no-tillage practices, perception of no-tillage by households (disaggregated on several factors like: manpower, farm size, access to services, ..),

c) G. Lestrelin mission report. Issued 2007 and based on 2006 data. "suivi evaluation des adoptions 2006". 71 p,

d) Several scientific reports and articles (Boyer 2006, Tran Quoc et al. 2005, Bounthong et al. 2005, Lienhard et al. 2006, Tran Quoc et al. 2006, Lienhard et al. 2007).

d) Activity reports of PASS/PRONAE.

[8] Information and Communication Technologies

3.2 Approaches proposed to analyze the results of the experiences in Conservation Agriculture

3.2.1. First batch of "dimensions" to be considered for assessing the systems proposed:

During the last mission of Dr. Rico Lie (Open Resource on Conservation Agriculture for Trade and Development – ORCATAD, Wagenigen University) in March 2008, in supporting NAFRI on the development of a knowledge and data base on CA, a set of dimensions for assessing the practices has been identified by this author and adopted by NAFRI. These dimensions have been firstly defined to describe a selection of exemplary practices for a database but their use will be extended to all products (source books, leaflets, audiovisuals supports) developed on the domain of conservation agriculture to define and to characterize each systems and technologies.

The selection of the dimensions was guided by the following principles (Lie and Tivet, 2008):

- The selection of the dimensions serves an inward looking function as well as an outward looking function. Inward means that the focus is on the quality of life of the farmers and appropriate extension services. Outward means that the focus is on the sector of policy makers and governing bodies, and the academic and scientific communities at large.

Using the selected set of dimension, Conservation Agriculture systems and technologies will be described in a qualitative (through descriptive stories) and quantitative ways (through results obtained on-field). The stories will highlight aspects of the dimensions (environmental sustainability, quality of life, regulatory environment and service provision, commercialization and advocacy) that are relevant and typical to the particular practice.

The selected dimensions are the following (Lie and Tivet, 2008):

- **Quality of Life**: This dimension is about the sensitivity that a practice has for the improvement of the quality of the life of the farmer and his or her livelihood. The Quality of Life dimension adopts the Sustainable Livelihoods Approach (SLA) as developed by DFID.[9] The quality of life equals a sustainable livelihood and can thus be seen as depending on the different identified capitals. For the purpose of assessing systems and practices in conservation agriculture on the dimension of quality of life, we have adopted the following capitals as being of relevance: a.) the human capital; b.) the social capital; c.) the physical capital; d.) the natural capital, and e.) the financial capital.
    - Human capital is defined by the OECD as "the knowledge, skills and competences and other attributes embodied in individuals that are relevant to economic activity". (OECD, 1998:9[10]). It refers to the kinds and levels of education needed, to training demands and to required skills and technological knowledge. It also includes health and psychological well-being of the farmer.
    - Social capital is the whole set of social relations that are relevant in one way or the other for production purposes. "For the majority of writers it is defined in terms of *networks*, *norms* and *trust*, and the way these allow agents and institutions to be *more effective in achieving common objectives*" (Schuller[11]). It refers to community issues and collective organizational requirements. Issues that are of interest here are for instance: sensitivity to labor inputs and availability of labor, sensitivity to gender (un)balances, and sensitivity to cultural embeddings. Social capital also includes cultural embedding and appropriateness. A new practice can for instance be a continuation of an existing practice or the change to the new

[9] See for instance: http://www.livelihoods.org/info/guidance_sheets_pdfs/section2.pdf.
[10] OECD (1998). Human Capital Investment: An International Comparison, Paris: Organisation for Economic Cooperation and Development.
[11] www.open.ac.uk/lifelong-learning/papers/393B8E05-0008-65B9-0000015700000157_TomSchuller-paper.doc

practice can be too vast, and the gap between the traditional practice and the new practice can turn out to be too big.

- Physical capital consists of non-human assets that are made by humans and are required for or used in production activities, e.g. technical equipment. But besides technical equipment, physical capital also includes infra-structural capital, which refers to communication infrastructures, roads, irrigation dams and any physical improvements made to nature.
- Natural capital refers to water, land, air, plants, etc... This capital is about the potential that nature offers. It is commonly divided into renewable resources (agricultural crops, vegetation, wild life), and, non-renewable resources (fossil fuels and mineral deposits).
- "Financial capital denotes the financial resources that people use to achieve their livelihood objectives" (DFID). It refers to the availability of cash or equivalents that people apply to improve their livelihood and their quality of life.

The economic dimensions for each system proposed will be presented following classic methodologies used for assessing cropping systems. The objective of the work will notably be to compare the economics of the set of innovative systems (annual crops, livestock) proposed by the NAFRI/PRONAE/PASS research/extension work and also with conventional systems commonly use in southern Xayaburi and Xieng Khouang. When considering the economics of the tillage and no-tillage systems, the following areas affecting profit will notably be addressed:

- Changes in yield per hectare
- Changes in cost per hectare (land productivity)
- Changes in net income / man.day of work (labor productivity)
- Changes in pre-financing requirements (inputs, land preparation, etc)
- Changes in the distribution of labor requirements
- Impact on net income risk.

The economic analysis will also be conducted at the level of other important actors of the current agricultural landscape: the service providers (notably the providers of mechanized land preparation services). It is indeed important to measure how far the introduction of the new system of equipment promoted by PASS/PRONAE will affect positively or negatively the profits of land preparation service providers: taking into account costs of equipment purchase, maintenance costs, etc. Profitability of investment in tractors will notably be compared between conventional and conservation tools.

For each of the systems proposed, data available through the current M&E system will be compiled and complemented by additional field surveys. The assessment of the economic performances of the systems proposed will require interaction between research, practitioner/extensionists and farmers themselves. The work will necessitate an update of the current knowledge on the economics of the cropping/farming systems locally practiced. It is notably important to revisit the economics of the various systems in light to the current trend of price changing for the main cash crops.

The 5 capitals cover the human, inter-human (social), extra-human (man-made artefacts), and non-human (nature) aspects of the quality of life. It is not necessarily so that the larger the capital, the higher the quality of life is. However, it is envisaged that the quality of life is subject to the qualitative existence of these capitals, individually and in relation to each other. The description of the dimension of the 'quality of life' should therefore include reviews of the characteristics of these capitals and score the amount of sensitivity to these capitals – **A high score on this dimension means that the practice has a positive influence on the improvement of the quality of life of the farmers and is thus sensitive to issues related to human, social, physical, and natural capital.**

- **Environmental Sustainability**: This dimension is about maintaining the qualities that are valued in the natural environment on a long-term basis. To what extent does the practice sustain the environment and conserve agricultural diversity? To what extent are the production techniques environmentally sound? To what extent does the practice have a positive result on the maintenance of biodiversity and the totality of the eco-system? To what extent does the practice promote the natural functioning of the eco-system? Good integrated management aims to maintain enough diversity to allow interesting eco-systemic properties to emerge. – **A high score on this dimension means that the practice scores high on maintaining the natural eco-system and promoting the natural functioning of the eco-system.**
- **Regulatory Environment and Service Provision**: This dimension is about the availability of a supportive political climate and regulatory environment. It also includes the availability of rural services; extension services and other support services. To what extent is the political and regulatory environment supportive to the practice? Is the practice appropriate and does it fit into the existing environment? Issues of concern are for instance: the political environment; regulation; market access; taxes; the financial context; credit provision; reasonable pricing; effective extension support; facilitating marketing…[12])? Does the government enable a positive environment? – **A high score on this dimension means that the regulatory environment is supportive towards the practice and that rural services are appropriate and in place.**
- **Commercialization and Advocacy**: This dimension is of a different nature than the three dimensions identified earlier. It measures the potential that a practice has for trade and advocacy. It captures the 'market outlook' of a practice by identifying characteristics of the practice that have high marketing potential, and thus high economic potential. These characteristics can come out of the above mentioned three dimensions, a combination of these three dimensions, or from a totally different field of operation of the practice. A practice could for instance perfectly fit into the discussion on the establishment of a new 'good for development'-label[13], or it could nicely fit within existing trade relations… – **A high score on this dimension means that the practice has (a) characteristic(s) that ha(s)ve high potential for use in (social) marketing.**

This approach has the advantages to be rather broad, comprehensive, structured and in addition to bring in new concepts into the debate on and advocacy for Conservation Agriculture. It fits particularly to apply this approach when the capitalization process will have researchers and to some extend decision makers as audiences.

[12] QAMAR, M.K. (2007). Agricultural Technology Management, Transfer and Commercialization: An Overview with Focus on Asia-Pacific Region, paper presented at the International seminar, "Best Practices in Agricultural Technology Transfer", held from 5 to 9 November 2007 at Colombo, Sri Lanka, organized by the Asian Productivity Organization, Tokyo in collaboration with the Ministry of Agriculture Development and the National Productivity Secretariat, Sri Lanka.

[13] ELLIS, K. & WARNER, M. (2007). Is the Time Ripe for "a Good for Development" Product Label, ODI Opinion Paper, October. (http://www.odi.org.uk/IEDG/Business_Development_Performance/Papers/ODI_op88_Good_for_Development.pdf)

3.2.2 Adoption of the systems and characterization of the research/extension approach promoted by the PRONAE/PASS

Adoption of the technical systems:

After four seasons of research and field extension work on conservation agriculture techniques, it is important to draw a picture of the current and possible future trends for the adoption of the systems by farmers. Although such work has to some extend already been undertaken on a continuous basis by NAFRI/PRONAE teams in the past periods, it looks important to produce a final set of analysis and documents on the situation in both provinces.

This will necessitate an updating of the 2006 study (conducted by G. Lestrelin) as well as additional field work in order to add more qualitative information.

It would notably necessitate the organization of individual interviews and focus group in order to understand the reason for adoption or partial adoption of the systems. This study would be comprehensive and include the economic aspects as well as other potential factors for non-adoption (reluctance to innovation, risk aversion, etc.) and adoption (quality of the extension approach, potential subsidization effect from project environment).

The study on the trends for adoption and non-adoption will also particularly look at the possible partial adoption by farmers of the "technological package" proposed by the PRONAE/PASS. Issues and prospects for partial adoption will be looked at (advantages, potential risks, etc).

Adoption will also looked at at the level of the service providers: tractorists, tractor owners, input suppliers…the willingness of all those actors to engage into the provision of the package of services that are necessary to practice Conservation Agriculture in the area will be assessed : land preparation services, specific inputs, credit supply etc.. Factors determining the "willingness to adopt" from this type of actors will be highlighted in a way to provide guidance for future replication of the approach.

Adoption of the specific research/extension approach promoted by the PRONAE/PASS:

What will be examined here is to what extend the approach (understood as: methodology + ad hoc human and financial resources) developed by PRONAE/PASS has been adopted and/or has a potential to be adopted, by the Lao research/extension system, at various levels.

This will be done from different angles. One important angle will again be the financial aspects and specific care will be paid upon developing capitalization documents that are highlighting the costs associated to the research/extension approach on Conservation Agriculture. Costs will be sorted out under different categories, preferably similar to the three categories of expenses of the Lao public spending system: capital expenses, recurrent costs, investments.

Simple comparison will be done between the costs associated to the Conservation Agriculture Research/extension approach and the financial resources available through the Lao research/extension system.

This last angle of analysis of the conditions for adoption (at the level of the Lao extension/research system) will be particularly used in a view to prepare capitalization/advocacy documents targeted toward a decision-maker audience.

Activities proposed:

Joint activities proposed relatively to the assessment of the economic aspects of the systems proposed and the current trends for adoption are:

- An updating of the M&E system of PASS and PRONAE and analysis on the adoption of CA practices[14] in the southern Xayabury: it will be conducted, using the same methodologies. It is planned to mobilise the same expert, Mr. Guillaume Lestrelin (LCG). Indicative TORs are given in annex 1,

- Conducting a additional field study in Xieng Khouang (annex 2) focus on four objectives: 1) analysis of the agrarian transition, 2) adoption of no-till systems and land management, 3) analysis of farming systems evolution (income, labour inputs, off-farm activities etc), and 4) development of a simple tool to monitor farming systems changes (based on PASS experience). This study would be implemented by a consortium LCG - NAFRI/AFPRC. This Consultant team could also be assisted by students from Nabong faculty recent graduates and French students, during the period of October 2008 to April 2009. This team would be interacting with and would receive guidance from PRONAE/PASS/UC teams/TAs.

The consultant in charge of the updating of the PASS/PRONAE M&E system as well as the updating of the study on the adoption of the Conservation Agriculture systems, would also be allocated with time to provide guidance to the team of French/lao student in charge of conducting the field study in Xieng Khouang province.

4. Elaborating in a collaborative way a set of knowledge documents (papers, media, extension tools, scientific papers, policy notes…) adapted to various audiences.

The objective of MAF is three-fold. First, it wants to conserve a knowledge base for the agricultural sector at large by presenting systems/practices and related materials in conservation agriculture. The second objective is to operate as a pool of educational material to be used by smallholders, extension service providers, agronomists and educational institutions operating in the same domain. Third, MAF also wants this work to be of relevance as a promotional tool and as an advocacy tool in the domain of policy making (at different levels). As such it will emphasize issues of sustainability (environmental health, economic profitability and social and economic equity).

Based on the experiences of PASS and PRONAE (components of PCADR) several products will be created:

- Audiovisual supports available to a wide audience using different formats (TV, DVD and VCD),
- Field guides on Conservation Agriculture for smallholders, extension officers, trainers and agronomists,
- Training materials for agronomists, extension officers and educational institutions,
- Assessment of the evolution of the agrarian systems, economic aspects of the innovations and current trends of adoption,
- Documents and tools to interact with decision-makers,
- Synthetics and scientific papers on different issues,

Several formats will be used to facilitate accessibility of target groups to these different products. The formats are described below and will refer mainly to hard copy (source book, leaflet), soft copy (DVD, VCD, and CD-Rom) and internet support. Most of these products will be directly accessible through MAF/NAFRI website and others link (CIRAD…). Moreover, a data base accessible through non-proprietary means (producing a web based version that is accessible with a Firefox browser and designing a stand alone LINUX version) will be created on NAFRI website to present a selection of exemplary systems and practices on CA (Lie and Tivet, 2008).

The elaboration of the various documents will mobilize primarily the teams from PRONAE/PASS component of PCADR with ad hoc support from Central Unit.

[14] Lestrelin G. rapport de mission d'appui. Suivi évaluation des adoptions au sud de la province de Xayabury.

Specific supports will also be required for the elaboration of the audiovisual supports (see specific document in annex).

As mentioned in the previous chapter of the document, the PCADR is planning to mobilize team from LCG, NAFRI – AFPRC, Lao/French students in order to assist in the analytical work at field level as well as in drafting capitalization documents. TORs for this specific work are in the process to be fully developed and given in annex to this document on a draft basis.

Those teams of student will be adding to the Consultant team (LCG, NAFRI – AFPRC) and receive guidance from TAs as well as from Ministry of Agriculture and Forestry staff.

5. The specific targets groups

There are four specific target groups:

7. The first target group consists of smallholders/farmers. The knowledge base aims to be of relevance at different levels of detailed technical information integrating the biophysical conditions and the different capitals (human, financial, natural, physical and social).
8. The second target group consists of extension officers, agronomists and educational institutions in the field of conservation agriculture. For educational institutions, an overview of basic information and general description of practices will be sufficient. For extension officers and agronomist on the other hand it is important that the knowledge base not only provides an overview of basic information on exemplary systems and practices, but also provides detailed technical (and scientific) information.
9. The third target group is the national community of governmental and non-governmental organizations operating in the domain of agriculture or related domains. For this target group some products of the knowledge base can be used as an advocacy tool.
10. The fourth target group is the (international) scientific community operating in the domain of agriculture. For this target group specific productions will be achieve as scientific articles on conservation agriculture.

6. The products

6.1- Database on exemplary practices in *Conservation Agriculture (from Lie and Tivet, 2008)*

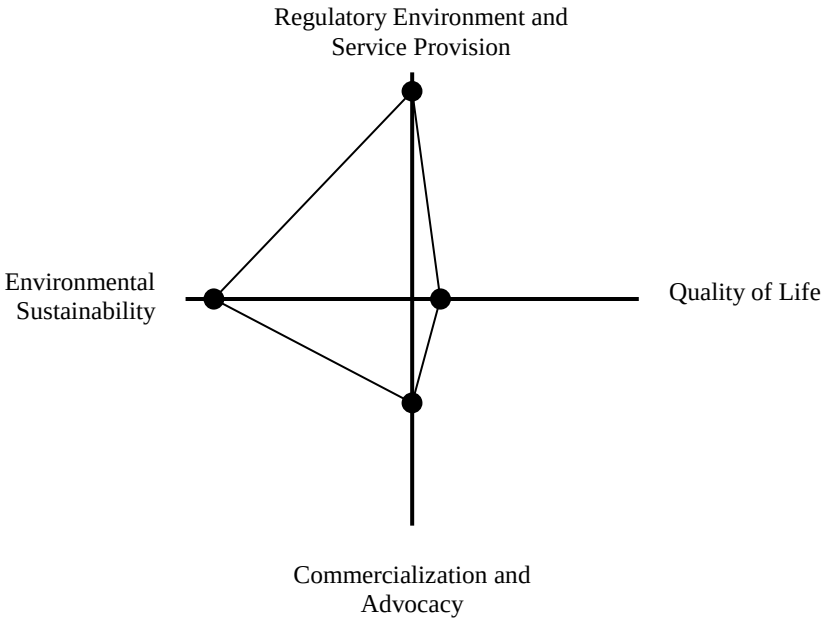
A database presenting exemplary practices in the field of Conservation Agriculture will be developed and each practices will be accompanied by a so-called 'web'-visual, an image that visualizes the scores on the 3 inward looking dimensions (Environmental Sustainability, the Quality of Life, and, the Regulatory Environment and Service Provision) and the 1 outward looking dimension (Commercialization and Advocacy).

The content of the database consists of two main areas and several sub-areas:

3. Exemplary Practices and Materials (audiovisual materials, source books, field guide, scientific articles)
4. Related Material
    a. Selected bibliographies in several fields of interest
    b. Selected set of links to relevant information on the internet
    c. Networking in conservation agriculture

Below you will find an example of how the scores on the four different dimensions can be visualized in a quadrangle (this visual representation will be used only to describe exemplary practices for the database). A first description of systems and practices is presented in appendix 3.

Fig 1. Example of a Quadrangle



6.2- Audiovisual products available to a wide audience

Three main products are expected as 1) documentary, 2) thematic video and 3) technical issues. The three first target groups presented above are directly concerned by this activity. Terms of reference of these products are presented in appendix 2. The technical issues will be broadcasted on VCD and will come with the source book described below (annex 4).

6.3- Field guide in Conservation Agriculture for farmers/smallholders

A field guide, constituted of 8 booklets, is created for farmers/smallholders. Training field guide (see paragraph 4.4) is also developed for extension officers, agronomists and educational institutions.

This field guide for farmers will be built on the following chapters:

Booklet 1: Main principles of no-till systems and crop rotations

This first chapter refers to the three main principles of no-till systems and cover crops as 1) permanent soil cover, 2) no-mechanical actions and burning, and 3) crop rotations.

Booklet 2: How to implement no-till system integrating local knowledge and situations

Main objective of this chapter is to highlight the need to follow an iterative process in implementing no-till systems using local resources (species and equipments) and integrating biophysical and socio-economic environments.

Booklet 3: Use of equipments (sowing machine, sprayers, rolling knife, fertilizer broadcaster)

Different equipments used for no-till systems are described emphasizing small-scale machinery locally available for smallholders (one sowing line, hand jab seeder, rolling knife and fertilizer broadcaster). Conditions of use and all setting are described allowing self-management of these equipments. Blueprint of some equipments are provided.

Booklet 4: Weeds management under no-till systems

Under no-till systems different weeds management schemes are followed using herbicide, mechanical (rolling knife) and/or biological control (permanent soil cover, shading and/or allelopathic effect). These three ways are described and this chapter emphasizes the importance of crop rotations and full soil cover in following an integrated weed management.

Booklet 5: Management of soil fertility

Simple pictures are used in this chapter emphasizing the impact of crop residues in preserving and enhancing soil fertility (physical, biological and chemical) and water retention through soil aggregation. For extension officers, agronomists and educational institutions detailed information are given on the level of mineral elements exported for each crop (maize, soybean, rice…), and on the processes of particles aggregation.

Booklet 6: Crop management and use of cover crops

In reference to the situation in the southern Xayabury and in Xieng Khouang this chapter described the use of local species (rice-bean, job's tears, maize…) to improve rotational sequence and the efficiency of no-till systems. A progressive approach is presented from the use of local species to the integration of exogenous species (*Cajanus cajan*, *Brachiaria ruziziensis*, *Stylosanthes guianensis*, *Crotalaria* sp., *Eleusine coracana*…).

Management (establishment, seed production, control) of cover crops is described using bibliography reference and local experiences of PASS and PRONAE. More detailed information is given for educational institutions on the nutritional value of each multipurpose species.

Booklet 7: Implementation and management of fodder species

This chapter deals with the establishment and management of fodder species integrating adaptability of each specie commonly used in Lao PDR and in the two provinces. Materials from NAFRI and CIAT (FSLP project) are also used in this chapter.

Booklet 8: Integrating livestock components (cattle fattening and pig raising)

Cattle fattening and pig raising practices are fully developed in this chapter presenting technical (breeding, housing, and animals' health) and economic considerations (nature of animal feeding, protein availability at local level). For pig raising experiences of PASS is fully described and evaluated.

Posters

Additional products as posters will be created to be on display in the villages, authorities' offices (PAFO, DAFO), and governmental agencies (NAFES, NAFRI). It is planned to produce a set of 6 posters illustrating most of the topics presented above.

6.4- Documents and tools for interaction with decision makers

Interaction with decision maker will necessitate the elaboration of specific documents under formats adapted to an audience that is used to concise and synthetic briefs.

At this, stage, considering the objectives of PROSA and PCADR as a whole and the challenge of having Conservation Agriculture principles and methods rolled out into the Lao Extension and Research system, and further, adopted by farmers, the following topics could be covered by the documents to be prepared :

- 1) The agricultural policy implications of Lao experience in Conservation Agriculture: management of pioneer fronts (land allocation, management of value chains), measuring and mitigating the impacts of current extension of cash crops for exports.
- 2) Implications of Conservation Agriculture experience for the coordination of research and extension in Lao PDR (national and decentralized level). This will encompass the role for the public sector as well as well as guidelines for the enrollment of the private sector in promoting conservation agriculture practices. This document will notably highlight in a condensed form :
    - *How Public Agencies can facilitate adoption*
        - Education and Information
        - Financial Assistance
        - Research and Development of Practices
        - Extension orientations to conservation agriculture
        - Promoting Sustainable Agriculture Practices
        - Encouraging Farmers Involvement and Organization
        - Public agency funding / funding and incentives
        - Public administration and management
        - Programs and regulations
        - Knowledge and expertise
    - *How Commercial Firms and Dealerships can help/hinder conservation agriculture adoption*
        - Education and Information support
        - Client Oriented Extension
        - Products and Offerings
        - Funding and incentives
        - Private Sector Incentives for Sustainable Practices

- 3) Implication for future programs: as the Lao Ministry of Agriculture and Forestry is currently engaged in a process of designing future Program Based Approaches[15] in the rural development sector, it is of importance for the various projects/programs promoting currently Conservation Agriculture in Lao PDR to prepare in a coordinated manner a set of clear documents that could facilitate future preparatory work of those PBAs at MAF level. Those documents should propose concrete contents/set of activities, for future components of programs. As the phasing out of PCADR and are preparatory work for future PBAs at MAF level are coinciding, a window of opportunities is open.

It is sought at this stage to elaborate the various documents addressed to a "decision maker" audience, on the basis of the other types of documents described in this capitalization program. This will thus be done primarily through an exercise of synthesis.

This can thus be based on the current skills and PCADR and PROSA staff/TAs but could also be done by engaging collaboration with the AFPRC (Agriculture and Forestry Policy Research Center) from NAFRI, notably for the elaboration of a set of policy briefs.

6.5- Training and technical materials for agronomists, extension officers and educational institutions

More detailed information will be given for extension officers, agronomists and educational institutions for the different parts of the source book described above. Specifically for extension officers, agronomist and educational institutions criteria (to complete the 4 dimensions) will be used to detail agronomic characteristics of systems and practices. The selected criteria are the following:

- Restoration of eco-systemic properties:
  - Chemical (nutritional function of the cover crops, recycling nutrients…),
  - Physical (bulk density, soil permeability, structural stability of the aggregates),
  - Biological soil fertility,
  - Biological control of pests.
- Economics of Conservation Agriculture Techniques
  - Valuating Conservation agriculture,
  - Conservation Agriculture / vs Conventional. Economic point of view,
  - Economics of Conservation agriculture tools: specific farm equipment,
  - Long term benefits.
- Technological requirement:
  - To install and manage the cover crops,
  - Flexibility of cropping calendar,
  - Need of specific inputs and equipments and access to credit,
  - Labour inputs, gender sensitivity, cultural changes,
- Environmental sustainability:
  - Use of chemical pesticides and/or organic products, mechanical and biological control of the cover crops,
  - Preservation or enhancing soil potentialities (control of soil erosion, Carbon sequestration),
  - Functional biodiversity,
  - Water management (flux and quality).

[15] one initiative exist for the Northern Uplands and another is already launched for the southern uplands and midlands

Additional training materials will be created and based on the following topics:

Topic 1: An integrated approach of research and development to promote conservation agriculture (initial assessment, creating innovative systems, training and communication, organizing farmer groups and validation processes, scaling-up and monitoring).

Topic 2: Field guide adapted from: 1) *Participatory ecology training* and *Living Soils*, *Training Exercises for Integrated Soils Management* - The FAO Programme for Community IPM in Asia, 2) UEPG - Brazil and 3) from experiences of PROSA, PRONAE and PASS.

Soil texture, fertility (structure, aggregation, OM), and water retention

Simple tools are provided to extension officers, agronomists and educational institutions to analyze soil texture, structure and land situation (level of "degradation"). These tools are mainly visual and do not need sophisticated technologies and measuring instruments. Soil texture, soil aggregation, biological activity, soil compaction are the main products developed in this chapter.

Nutrients source and behavior

To understand the source of macro-nutrients, where they are stored and how they are lost from the system.

Crop growth, development stages and yield components

Simple indicators are provided to link development stages and growth for cereals (rice, maize) and legumes in order to define critical periods for yield components establishment.

Topic 3: How to exchange with farmer groups and to organize training (methodology)

Methodology of training and exchanges with farmer is presented; works of LEAP and experiences of PASS, PROSA and PRONAE are used.

6.6- Synthetic and scientific articles

Synthetic documents

The economics of Conservation Agriculture

This booklet will provide with a particular insight on the economic aspects of Conservation Agriculture in the Lao context. It will provide a synthesis of the economic returns farmers/smallholders can expect from practicing conservation agriculture under different cropping system. Aspects such as labor, investments costs, input costs, etc will be detailed.

Dimensioning a research/extension activity on conservation agriculture

This booklet deals with the costing and dimensioning of a research/extension activity at local (khumban, district or sub-provincial levels) in Lao PDR. This booklet will have as audience DAFO/PAFOS planners and present in a simple form a breakdown of the main costs associated to the methodology developed in Conservation Agriculture.

Scientific documents

These products concern the national and international communities. The scientific paper will be submitted to international journals with reviewers.

Paper 1: Intensification, diversification and spatial differentiation in the southern Xayabury (annex 5)

Paper 2: Conditions for the adoption of no-till systems

Paper 3: Improved pastureland and cattle fattening opportunities on the Plain of Jars

Paper 4: Effects of tillage, no-till systems and cropping sequence on yield components of maize

Paper 5: Effects of tillage, no-till systems and cropping sequence on soil biological activities

Paper 6: Effects of tillage, no-till systems and cropping sequence on physical and chemical soil characteristics

Paper 7: Improved pigsty in rural area

Paper 8: No-till systems and cropping sequence influence distribution and sequestration of organic carbon

Paper 9: No-till systems and cropping sequence influence yield components of maize

Paper 10: No-till systems and cropping sequence influence physical soil characteristics

7. The location and the formats.

The goal is to have most materials available in 3 languages: Lao, French and English. Currently, most documents and materials of projects are available in Lao and French, not in English.

7.1- A strategic location on the Web for the knowledge base on *Conservation Agriculture*

Connecting the database and the different materials and tools in conservation agriculture to the website of NAFRI seems the most logical option for positioning the knowledge base. It emphasizes the research component of the enterprise and profits from the established position of NAFRI in Laos. The NAFRI website is well developed and incorporates already a database consisting of documents relevant to agriculture in Laos (LAD - Lao Agricultural Database http://lad.nafri.org.la/lad/index.html).

Setting up a completely new website for the knowledge base is not desirable as it might become too isolated. In order to become sustainable the knowledge base must find a relevant and efficient position amongst the existing Agricultural Knowledge and Information System (AKIS). One should be aware of not creating a parallel system of knowledge and information.

7.2- DVD, VCD, CD-Rom, source books, leaflet, brochures

The different materials created will be available on different supports as source books, leaflet, brochures but also DVD, VCD and CD-Rom. For the audiovisual products and particularly the technical issues a set of VCD will be provided to farmers and extension officers.

8. The process of evaluating materials

Creating these products will enforce to follow the following steps:

1. Approval of the general content of each product and support identified (source book, poster, DVD, VCD, CD-Rom, articles…) by the committee presented below (*Institutional framework*),
2. Creation (writing, drawing, filming…) and translation of technical issues (hard copy and video): the products will be submitted to smallholders, extension officers and agronomists for validation before step 4.
3. Creation (writing, drawing, filming…) and translation of others products (documentary, thematic, training materials, synthetic document…).
4. All products will be submitted to the editing group (team no. 4, see below *Labour inputs and periods*).
5. Submission and presentation of all products to the committee represented by DoP, NAFRI, UC-PCADR, PROSA, AFD/FFEM and CIRAD for validation.
6. Layout,
7. Publishing and broadcasting.

9. Institutional framework

Department of Planning and International Cooperation of MAF acts as the executive agency of PCADR and PROSA, it will delegate the implementation to UC-PCADR, NAFRI/PRONAE, PASS, and PROSA. Moreover, NAFRI will receive the support of Wagenigen University and CIRAD through ORCATAD project (EU funding).

A committee will be organized to approve step 1 (approval of the general content of each product) and to approve all products after steps 2, 3 and 4 describe above. This committee will be composed by:

- Department of planning and international cooperation of MAF,
- NAFRI,
- NAFES,
- UC-PCADR,
- PROSA,
- Smallholders, agronomists and extension officers for technical issues,
- French Development Agency will act also as a representative of FFEM,
- CIRAD.

10. Labour inputs and periods

Several teams will be organized through human resources from UC-PCADR, NAFRI – IMC (*Information management centre*), PROSA (students and national expertise), PASS, PRONAE, CIRAD and Wagenigen University. The distribution of the activities is presented hereafter.

A first team is organized to produce audiovisual supports; it is composed of six persons (two from NAFRI – IMC, two persons from the department of culture and communication of Xayabury and Xieng Khouang, one person from UC-PCADR and one person from PROSA).

A second team of technicians (UC-PCADR, PROSA-students, NAFRI-IMC, contractual staff funded by ORCATAD, and consultants from NAFES/LEAP) is organized to design, and translate (in lao and english) in partnership with technical team of PASS and PRONAE technical and training materials (source books, leaflet, and posters). This team integrates person specialized on creating materials, drawing, and translating; they will be hired through the network of NAFRI – IMC, UC-PCADR, and NAFES/LEAP.

This team will also be responsible in developing a specific website in CA on NAFRI website and the structure of the database (producing a web based version that is accessible with a Firefox browser and designing a stand alone LINUX version).

Tasks and responsibilities:

- Coordinating the activities: "project" coordination team (NAFES/LEAP, NAFRI-IMC, UC-PCADR, PROSA coordinator),
- Database and website (two technicians from NAFRI – IMC),
- Creating materials, drawing and translating (2 consultants from NAFES/LEAP, 2 contractual staff from NAFRI-IMC, 2 students from PROSA, and technical staff from PRONAE, PASS and PROSA: trainers, translators, extension officers/agronomists).

A third team includes national technical assistance from PASS and PRONAE and will validate with the first target groups (smallholders and extension officers) the materials created.

A fourth team is in charge of editing the materials before validation by the committee. This team should be composed of at least three persons.

A precise time schedule is presented below to fulfil these activities; the collaboration and transfer of information from one team to another one will be crucial in the success of this project.

Products	Expected results	Broadcasting and targets	Associated partners
DATABASE	Exemplary practices in CA	Website and VCD, CD-Rom Policy-makers, Agronomists, Educational institutions and International community	NAFRI – IMC, CIRAD, PRONAE, and Wagenigen
AUDIOVISUAL	Documentary to be broadcast on international network	TV + DVD + website, wide audience	NAFRI – IMC, UC-PCADR Provinces of Xieng Khouang and Xayabury PASS, PRONAE, PROSA
	Thematic issues (6 to 8) to be broadcast on national network	TV + VCD + website, wide audience	
	Technical issues	Lao Extension system (VCD) + website, smallholders, extension officers, educational institutions, agronomists	
FIELD GUIDE	Detailed technical issues in CA	Books, Website and CD	NAFES/LEAP, NAFRI-IMC, PRONAE, PASS, PROSA, UC-PCADR
TRAINING MATERIALS	Field guides for trainers, agronomists and educational institutions	Books, Website and CD	
SYNTHETIC AND SCIENTIFIC ARTICLES	Scientific information in CA (characterization of no-till systems ; adoption processes and methodology)	Articles, scientific community + website	NAFRI/PRONAE, PASS, CIRAD, NAFRI – AFPRC, UC-PCADR

11. Funding

Several programmes (PCADR and PROSA), components of PCADR (PASS and PRONAE), institutions (NAFES, NAFRI/CAFRI, CIRAD) and donors (AFD, FFEM, EU/ORCATAD, SDC) are requested to contribute to this program of capitalization in *Conservation Agriculture*.