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LAO: Capacity Building for Smallholder Livestock Systems

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Vientiane, Lao PDR

For the Ministry of Agriculture and Forestry

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Asian Development Bank

**CAPACITY BUILDING FOR
SMALLHOLDER LIVESTOCK
SYSTEMS PROJECT (ADB 4406)**

FINAL REPORT



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EXECUTIVE SUMMARY

The purpose of the Capacity Building for Smallholder Livestock Systems Project (CBSLSP) was to prepare on-farm models of improved livestock production and to build the capacity of staff at district, provincial, and national levels to extend these models via the Northern Regions Sustainable Livelihoods through Livestock Development Project (NRSLLDP).

The strategy for capacity building consisted of three components: (a) formal training workshops, which incorporated review and planning sessions of extension activities, and were timed to provide the skills and knowledge needed to carry out planned extension activities in the following months; (b) on-the-job mentoring; and (c) monthly meetings at provincial level for extension management, including sharing of experiences, monitoring and planning. Training was practical, needs-based, and timed to support scheduled extension activities.

Mentoring was an innovative approach that was designed to accelerate the development of staff capacity. This was provided by experienced extension workers (mentors) of the District Agriculture and Forestry Extension Offices (DAFEO) in districts where Centro Internacional de Agricultura Tropical (CIAT) had worked for several years, primarily through the AusAID-funded Forages and Livestock Systems Project (FLSP). Mentoring was carried out in two ways. Firstly, trainee DAFEO staff traveled to the mentor DAFEO to work in the field alongside the mentors. In this way, they (i) gained a sense of the process of interaction with farmer through direct observation; (ii) met farmers at a range of stages of improvement of their livestock systems; and (iii) learnt directly about the forage and livestock technologies in areas where forages were already achieving impacts. Secondly, selected mentor staff traveled to the districts of trainee staff at key times to help initiate and support extension activities. Mentoring input was provided for the first year only, as it was judged that the trainee staff had gained basic technical knowledge and professional commitment to their work within that year. Further exposure to examples of more developed livestock systems in the mentor districts was continued through field-visits scheduled with the training workshops. Monthly Networking Meetings were held at the provincial level for on-going exchange of experiences and management of extension. This reinforced the peer commitment to the work, maintained a learning environment, and helped staff to develop the problem solving attitude necessary for resolving the day-to day issues of extension implementation.

The 'pathway' to enable smallholders to shift from extensive, low-input livestock production systems to more managed and productive systems was a second innovative aspect of the project. The first step was the use of planted forages as an 'entry point' for livestock intensification. While technically not difficult, planting forages was a novel activity for upland farmers. Forages provide accessible and high quality feed resources, which enables farmers to further intensify their livestock production systems. While this model had been applied within a CIAT 'research for development' project, the CBSLSP aimed to extend the model to a larger number of remote districts and provinces.

CBSLSP articulated the pathway for livestock development into three steps of progressive intensification: (1) establishment of small areas of forages to ensure easy access to additional feed; (2) improvement in basic management of livestock; and

(3) enhancement of the productivity of livestock production systems. These steps provided a framework for planning extension messages to farmers and, consequently, the training inputs for capacity building activities. The second step corresponded with the production model used in the design of the NRSLLDP.

The project began in November 2005 and establishment activities were completed by January 2006. The Project worked in 6 'trainee' districts, representing the first year target villages of the NRSLLDP, and all of these districts assigned the agreed quota of 4 extension staff as trainees. Most had a background in livestock production, and 25% were women, however, only half of the trainee staff were permanent government staff; the other trainees being contract staff with the Districts. As a result, there is a risk that these contract staff may leave to take up other employment, and thus not be available for the NRSLLDP.

In 2006, the trainee staff and their district offices selected four villages per district in which to introduce forages in the first wet season. In most of the 24 villages targeted in year 1, the trainee staff successfully engaged 5 farmers per village to plant forages (a total of 112 households). Forage establishment by farmers was successful with more than 90% of farmers establishing sufficient areas for effective feeding of livestock. In the second year, the establishment of forages expanded from 112 to 556 households; a five fold increase. The role of forages as an 'entry point' for more intensive systems was also demonstrated. In the second season, six per cent of households had begun to fatten cattle and 15% of farmers were applying basic improved management practices to their pig production.

In 2007, the project expanded to include two additional villages in each district. In these villages the adoption rates were accelerated markedly. After only one season the adoption rates in the new villages were similar to those of the original four villages after two seasons. This suggests that, once a more intensive model has been established in a district, many new farmers will adopt forages and improve animal husbandry more quickly as they can see the benefits obtained by early adopters.

In the mentor districts, 'enhanced production' (Step 3 in the progressive intensification) was achieved by several households in 2006. By 2007, 10% of farmers raising pigs in some village clusters in Luang Prabang were fattening their animals at 'enhanced levels'. This led to another group of farmers specializing in piglet production for sale to those farmers who were fattening. Improved models for cattle fattening and calf production have emerged but remain at a less intensive stage than pig production. As these models consolidate they can be used as examples for extension in the NRSLLDP.

For the DAFEO staff to assist farmers achieve NRSLLDP objectives, they will need to be able to perform the following key tasks to be effective extension workers:

- (a) Identify the existing constraints in livestock production experienced by farmers and identify suitable entry points for change;
- (b) Help farmers to establish, manage, and use forages for their animals. This is the first step towards improved management of their livestock;
- (c) Understand basic animal health problems and treatments;
- (d) Identify basic pragmatic improvements in livestock management and ways of introducing these to farmers ;
- (e) Understand how to assist farmers in assessing market requirements and improving their production to make use of market opportunities.

Rates of adoption of forages and of improved husbandry, and the development of the fattening systems listed above, indicate that DAFEO staff in the 6 trainee districts were able to perform tasks (a), (b), (c) and (d) effectively. Their ability to articulate the strengths and weaknesses of their work, and suggest ways to address these, indicates that staff have developed the critical abilities necessary to address the day-to-day challenges and plan further activities. By the end of the project, all but one of the districts had 2 to 3 staff who could effectively lead extension activities under the NRSLLDP. Pha Oudom District in Bokeo Province will continue to need special support, due to the large number of changes in staff during the CBSLSP.

Provincial coordinators now appreciate the role of forages as an 'entry point' for the intensification of livestock production, as well as the effectiveness of the extension and capacity building mechanisms used in the project. The provincial coordinators will be able to coordinate activities effectively for the NRSLLDP. A similar statement can be made for the national project director, whose commitment was an important factor in the success of the project. The achievements in the field, across a large number of sites, have served to convince the Department of Livestock and Fisheries (DLF) that the models were broadly applicable. As a result, DLF is now recommending that these models be applied by its staff in other projects.

In terms of the mentor staff, at least 6 mentor staff have developed strong skills in the training and mentoring of inexperienced staff. These staff can be relied upon as effective and responsible mentors for the NRSLLDP.

Useful lessons were learnt during the CBSLSP, which should be considered by the implementing agency of the NRSLLDP. These included:

- Forages can be introduced to smallholder farmers as an 'entry point' to begin to manage their livestock. Once examples of more intensive systems have been established in a district, these can then become an advanced 'entry point' for new farmers.
- Forage nurseries, as a general source of planting material for farmers, were difficult to coordinate, however, they were worthwhile as demonstration areas, for both staff and farmers, in the first year of work in a new district.
- Within 2 years, DAFEO staff can gain sufficient skills to carry out specified extension activities, equivalent to the levels required by the NRSLLDP. Effective capacity building requires the three elements of (a) workshops, (b) mentoring, and (c) networking. During the initial year of capacity building, expansion of extension services to a large number of new villages should not be attempted, as it would burden staff before they have developed basic skills and confidence.
- Mentoring was an essential component in enabling the trainee staff to perform their field activities in the first year. By the end of the first year, they had developed their own professional commitment and, as a result, intensive mentoring was no longer necessary. Mentoring is still needed, however, when new extension activities (such as cross-visits and participatory market chain studies) are introduced to staff.
- Monthly networking meetings formed the backbone of on-going support and monitoring, and proved to be extremely valuable. Where this was not available

(e.g. during the first year in Pha Oudom and Vieng Phoukha) staff performance was notably weaker.

- Efforts were made to familiarize local authorities such as Heads of DAFEO and District Governors with the work processes and to the potential of these processes to contribute to national goals of poverty reduction and reduction of shifting cultivation. This was very important in providing local support to extension initiatives and to the morale of the extension staff.

Throughout 2007 a consistent effort was made to link CBSLSP to the nascent NRSLLDP. With this in mind, the National Project Director assigned to the NRSLLDP and senior staff of DLF were involved in a series of activities including: (a) the joint monitoring mission in June 2007; (b) the exposure visit for district authorities in July 2007; (c) the study visit to Daklak, Vietnam in August 2007; (d) the external assessment in October and November 2007; (e) the preparation of field guidelines in November 2007; and (f) the lessons learnt workshop in December 2007. As a result, by the end of 2007, the NRSLLDP was well acquainted with the processes used by the CBSLSP.

By the beginning of 2008, the prospects appear to be excellent that the NRSLLDP will achieve the development of 'basic managed livestock' production systems (Step 2 in the progressive intensification) in the target areas by building on the CBSLSP achievements.

To move beyond Step 2, towards 'enhanced production systems', will require additional market related activities. These include: (a) stimulating market awareness amongst farmers to promote interest in more intensive production technologies; (b) establishment of service providers for inputs such as animal health, breeding services, and the supply of forage planting material; (c) supply chain linkages with traders; and (d) streamlining of international trade procedures to facilitate cross border trade of livestock. Models for these were not piloted within CBSLSP, however, models have been developed by CIAT through the 'Small-scale Agro-enterprise Development for the Uplands' (SADU) project supported by the Swiss Agency for Development Cooperation (SDC). Links with projects such as SADU may help the NRSLLDP to apply some of these models and so develop more market-oriented livestock production systems.

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LIST OF ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
CBSLSP	Capacity Building for Smallholder Livestock Systems Project
CIAT	Centro Internacional de Agricultura Tropical (International Center for Tropical Agricultura)
DAFEO	District Agriculture and Forestry Extension Office
DLF	Department of Livestock and Fisheries
EA	Executing Agency
EU	European Union
FLSP	Forage and Livestock Systems Project
LEA	Lao Extension Approach
LEAP	Lao Extension for Agriculture Project
LPB	Luang Prabang
LFSP	Livestock Farmer Support Project
HH	Households
JMT	Joint Monitoring Trip
MAF	Ministry of Agriculture and Forestry
NAFES	National Agriculture and Forestry Extension Service.
NAFRI	National Agriculture and Forestry Research Institute
NGPES	National Growth and Poverty Eradication Strategy
NPD	National Project Director
NPRS	National Poverty Reduction Strategy
NRSLDP	Northern Regions Sustainable Livelihoods through Livestock Development Project.
PAFO	Provincial Agriculture and Forestry Offices
PC	Provincial Coordinators
PD	Problem Diagnosis
PDR	Peoples Democratic Republic
PMCS	Participatory Market Chain Study
PMU	Project Management Unit
PLDP	Participatory Livestock Development Project
PPTA	Project Preparation Technical Assistance
PRA	Participatory Rural Appraisal
PRF	Poverty Reduction Fund
SADU	Small-scale Agro-enterprise Development for the Uplands Project
TA	Technical Assistance or Technical Advisor when a person
TOR	Terms of Reference
XKH	Xieng Khouang

1. INTRODUCTION

Previous work by CIAT, in the Forage and Livestock Systems Project (FLSP, 2000-2005), showed that planted forages were a first step to developing more intensive smallholder livestock production. As a result, CIAT was engaged with ILRI to design the NRSLLDP, to use planted forages as the entry point for improving livestock production. While the FLSP worked in a substantial number of villages (more than 1300 households in over a hundred villages in five districts of two provinces) its results were achieved with substantial TA support. This was to be expected as it developed new technologies and developed models for improved feeding systems for livestock.

The broad aim of the CBSLSP was to apply these on-farm models of improved livestock production over a wider area with reduced TA input, and to use innovative methods to build the capacity of inexperienced extension workers in new districts to extend these models.

2. BACKGROUND TO THE PROJECT

2.1 Introduction

Livestock are of great importance to villagers in the uplands of the Lao PDR, as has been documented in recent studies, especially the Participatory Poverty Assessment¹, the Review of the Livestock Sector of the Lao PDR², the National Poverty Eradication Programme³, and the recently completed Project Preparation and Technical Assistance (PPTA 4287-LAO) for the Northern Regional Sustainable Livelihoods through Livestock Development Project (NRSLLDP). It is estimated that smallholders raise 95 percent of total livestock in Lao PDR, and themselves derive in the order of 50% of their cash income from sale of livestock. More market-oriented livestock production has enormous potential as a transition pathway out of shifting agriculture and poverty.

Current systems of raising livestock in the northern Lao PDR are based on low input and are correspondingly low output systems. Often, animals graze or forage for themselves with farmers having little or no involvement in producing feed for animals, other than the opportunistic use of crop residues as a source of feed. These low input systems are characterized by low growth rates, low reproduction, and high mortality.

To improve livestock production requires a change in the traditional system of raising livestock. Given the diversity of upland conditions, there will be no single system, but rather a range of improved livestock systems suited to different conditions. This multiplicity of solutions requires farmers to be engaged in adapting and innovating new systems that fit their local conditions. Such changes in production systems pose major challenges to extension activities. They require that extension staff have good technical knowledge in forage and livestock technologies, and that they are able to employ participatory extension approaches.

2.2 Addressing the problems

Past and ongoing projects have identified the limited availability of experienced counterpart staff, particularly at the provincial and district levels, as a major challenge to instituting change. A preliminary institutional capacity assessment concluded that staff of the Provincial Agriculture and Forestry Offices (PAFO) and the District Agriculture and Forestry and Extension Offices (DAFEO) will benefit from (i) increased technical knowledge and relevant field experience in addressing livestock management issues, and (ii) strengthened social skills and orientation in effectively consulting with farmers of diverse cultural background. Thus the development of extension capacity is the key element to unlock development of livestock production in the uplands.

¹ ADB PPTA 2001. Participatory Poverty Assessment, Lao PDR. Asian Development Bank, December 2001, Manila Philippines.

² Review of the Livestock Sector in the Lao People's Democratic Republic, Asian Development Bank, July 2002.

³ National Poverty Eradication Programme, 8th Round Table Meeting, September 2003. Now known as the National Growth and Poverty Eradication Strategy.

The CIAT and NAFRI implemented, AusAID funded, Forages for Livestock Systems Project (FLSP) worked extensively in this area of extension methodologies and technical information on forages. The experiences of the FLSP over the five years to June 2005 were the basis for designing and implementing this TA.

During the preparatory mission to develop the PPTA proposal for the NRSLLDP, from 23 September to 3 October 2003, the importance of building the capacity of key national, provincial, and district officers was identified as a major issue. Following this mission, a concept paper on 'Capacity Building for Smallholder Livestock Development' was prepared and submitted to the Poverty Reduction Cooperation Fund (PRF) for funding consideration. The concept paper was endorsed at the strategy meeting of the Cooperation Fund in support of the formulation and implementation of National Poverty Reduction Strategies (NPRS Fund) and the PRF in January 2004. A mission to Vientiane and Xieng Khouang was undertaken during 20 to 21 April 2004 to formulate the technical assistance (TA).

Subsequently, the Department of Livestock and Fisheries (DLF) was assigned as the Executing Agency (EA) with CIAT directly selected by the ADB to support TA implementation. The proposal submitted by CIAT was approved on 8 November 2005 with the start date for the 28 month TA as 15 November 2005.

2.3 Beneficiaries

This TA was designed so that the direct beneficiaries would be upland farmers in six of the poorest districts in northern Lao PDR. As a result of well-targeted interventions, farmers would begin to shift from being livestock keepers to being livestock producers. The benefits would flow to farmers with both large and small animals, with the expectation that pig rearing systems would experience the most rapid change. Pigs are raised by almost all households in the uplands, with greater importance in poorer households and with women taking primary responsibility. Thus poorer households and women were expected to be major beneficiaries of the TA.

The TA was designed such that technical staff plus heads of the DAFEO in these target districts, plus staff of the PAFO of these provinces, would gain skills in both participatory extension approaches and technical knowledge for improved livestock production. Management of extension activities would be devolved gradually to provincial and district levels, so staff could develop the capacity to continue to plan and implement the required extension activities, thus assisting in the implementation of the NRSLLDP in these districts.

The DLF would gain new perspectives on strategies for development of livestock production in the uplands, based on first intensifying production systems, followed by more enhanced interventions including animal health aimed at developing more market-oriented livestock production systems.

2.4 Government Policy

The TA is in line with the National Growth and Poverty Eradication Strategy (NGPES), which emphasizes 'community-driven and access-oriented' rural development. The NGPES considered addressing livestock disease and productivity issues as a priority for the poor. The TA supports the Government's Strategic Vision for the Agriculture Sector (December 1999), which emphasized community participation; the Government's Socioeconomic Development Plan 2001–2005, which emphasized livestock development as one of the poverty reduction measures; the Poverty Reduction Partnership Agreement between the Lao People's Democratic Republic (Lao PDR) and the Asian Development Bank (ADB), which included cooperation to improve agricultural productivity through improved livestock production as important for poverty reduction.

2.5 Purpose and Objectives

The main goal of the TA was to enhance the livelihood and income of poor farming families through improved agriculture service delivery, particularly to increase livestock productivity. The immediate objective was to strengthen the capacity of field extension officers to work with poor farmers in adapting and adopting technical and management options for improving smallholder livestock systems.

The outputs of the project were (i) the upgraded capacity of MAF at national, provincial and district levels, through field application of participatory methods introduced by other projects; in the process the number of staff with experience working with disadvantaged groups - women and ethnic minorities – will increase; (ii) expanded and improved FLSP approach to reach and involve poor families, particularly women and ethnic minorities, to address livestock-raising issues; and (iii) improved understanding of traditional practices in livestock raising, which may be used in extending promising technologies and management options to other areas⁴.

At the same time, the TA was to be linked to the NRSLLDP. This linkage in practice meant that (a) the TA would train a total of 24 DAFEO staff from the first cohort of 6 districts where the NRSLLDP would work, and (b) that these trained staff would then be assigned by the government to continue to work in the NRSLLDP. In this way the TA would preemptively build the capacity of staff in preparation for the NRSLLDP, and thus avoid the normal hiatus of many loan projects in Laos, which suffer from slow start up due to the need to first develop staff capacity⁵.

2.6 Strategy for development of livestock production

The challenge of changing traditional systems will be addressed through identifying 'entry points' for change. For most livestock systems there are periods when farmers must provide significant labor inputs to provide feed for their livestock. This provides an 'entry point' for the introduction of forages as a solution to an immediate problem, which then leads to working with farmers on improving their overall livestock production

⁴ TAR: Lao 38084 / 4406 Lao

⁵ Lao 38084 / 4406 Lao

system.

The establishment of forage plots close to the house provides an accessible feed source that reduces the burden of time and labor, particularly for women. As farmers recognize forages as a viable feed resource, they begin to adjust their livestock systems. Significant impacts are likely to be achieved in terms of an increase in the number of animals that can be managed, more rapid weight gain, and better prices due to the higher quality of animals.

By this stage, farmers have shifted from being 'livestock keepers' to 'livestock producers'. As farmers begin to produce for market demand, they then seek 'enhanced technologies', to further increase their productivity, including strategic feeding, improved herd management and breeding strategies to exploit the genetic potential of current breeds, and improved animal health procedures to ensure greater survival of livestock, especially the young.

Thus, to summarize, the pathway to improved livestock production involves three steps:

- (1) to establish small areas of forages to ensure easy, labor-saving access to additional feed,
- (2) to improve basic management of livestock, and
- (3) to enhance productivity of livestock production systems.

2.7 Extension approaches

The extension approach during the establishment phase stimulates a 'problem solving' attitude by farmers. Extension staff initiated this through the use of Participatory Rural Appraisals (PRA) to identify the specific constraints to livestock production. Inevitably, feed constraints will be identified and planting forages are one solution to solve this immediate problem. Farmers then evaluate a small range of forages and their use. As impacts such as labor saving emerge, extension staff 'capture' these impacts through follow-up activities, and expand these to other farmers through farmer-to-farmer exchanges. Soon farmers will be interested to address additional production issues, such as animal health and management, which can be introduced.

The move to the use of improved production technologies will not occur unless farmers make the mindset change from seeing livestock as an accumulation of wealth to being an enterprise for income generation. This change towards livestock as an enterprise requires that farmers develop a 'market orientation'. Extension staff can support this through facilitating farmers to understand the 'market chain'; how different parts of the chain function, and what are the requirements and opportunities presented by the chain. Farmers then see the need for enhancement technologies to meet these market demands and opportunities by the end of the project. Farmers in the 'mentor districts' are moving towards this level of livestock development.

As market-oriented livestock production develops, the demand for inputs and services such as forage planting material, improved feeds, mating services and animal health services will emerge. Stimulating and providing an enabling environment for such service providers is needed at this stage of livestock development. Other projects such as the CIAT Smallscale Agro-enterprise Development for the Uplands Project (SADU) are working to develop appropriate models.

2.8 Capacity building strategy: building on existing projects

The approaches to livestock extension based on forages as an entry point to livestock intensification have been developed in several projects in the Lao PDR, but most particularly in the AusAID-funded Forages and Livestock Systems Project (FLSP), implemented by CIAT. Over the five years of this project, Provincial and District Officers gained well recognized capacity in forage agronomy and use, working with farmers in a participatory manner, and 'capturing' impacts. During the latter part of the FLSP, the SDC-funded Lao Extension in Agriculture Project (LEAP) developed approaches for extension training within NAFES, now called the Lao Extension Approach (LEA), which has been adopted by NAFES. This approach provides a structured process that assesses the needs in particular areas, then designs and implements appropriate training. The FLSP approach is compatible with the LEA approach used. It is, however, tailored to livestock extension with a focus on 'systems change' for livestock development.

The FLSP provided relatively intensive inputs for capacity building to staff over a five year period. As there are now experienced extension staff in some districts, there is an opportunity to fast-track capacity building. Staff who joined in the 2nd or 3rd years of the project became effective extension workers in a much shorter time by working alongside and being mentored by more experienced extension staff. This mentoring principal was the basis of capacity building in the CBSLSP. Continuing the work of the FLSP teams in their existing areas provided a key resource for on-the-job training and peer monitoring.

Capacity building will be provided by international consultants and national and provincial staff through a three-pronged approach: (a) formal training workshops, (b) on-the-job mentoring, and (c) monthly networking meetings at provincial level for sharing of experiences, monitoring and planning. The project built on the development of livestock improvements in the areas established by the FLSP. The mentoring provided by the Mentor DAFEO was in two forms:

Firstly, the Trainee DAFEO traveled to the Mentor DAFEO areas and worked in the field alongside the mentors to whom they were assigned, with inputs from provincial and national livestock specialists. In this way, they (i) gained a sense of the process of interaction with farmer through direct observation, (ii) met farmers at a range of stages of improvement of their livestock systems, and (iii) learnt directly about the forage and livestock technologies.

Secondly, the Mentor DAFEO traveled to the Trainee DAFEO sites at key times to help initiate field work in the Trainee districts and to review progress. These occasions were timed to be for events where direct demonstration will be of greatest value to the trainees.

This mentoring input was provided in the first year only, as it was judged that the trainee staff had gained the basic technical knowledge and professional commitment to their work. Continued exposure to more developed livestock systems in the mentor districts was carried out through field visits included in the training workshops. The Trainee DAFEO were distributed across all the Mentor Districts, and assigned to particular mentors to ensure they gain direct experience of work in the field. However,

only 8 to 10 of the best mentor staff were selected to travel to the trainee districts to provide instruction and guidance.

The third capacity building strategy was extension management. The main avenue was through the provincial coordination meetings held each month in Xieng Khouang and Luang Prabang. These enabled exchange of experiences on an on-going basis, and thus a reflection and learning environment, and contributed to building a sense of purpose and commitment to the work, and allowed staff to develop a problem solving attitude so as to resolve the day-to day challenges they will meet.

2.9 Field activities

Budgetary support was provided for field work in the Trainee DAFEO areas and the Mentor DAFEO areas. In addition, Trainee DAFEO received training on participatory extension methodologies, as well as technical background for forages, livestock production and animal health interventions. The aim was to identify four technical staff in each of the six Trainee DAFEO for training throughout the full period of the project. The reality of obtaining this number of permanent staff has meant that in many districts some staff assigned were contract staff rather than permanent government staff.

The cost of the four mentoring exchange visits between the Mentor and Trainee DAFEO were covered by the CBSLSP, with the plan of supporting additional activities with funds from the training component of the NRSLDP once it had been established. Each exchange visit required seven days of time for mentors and trainees, plus time for travel. Other costs included per diems, accommodation and travel expenses.

The Mentor DAFEO staff participated in training workshops on subjects such as dissemination strategies, market orientation, and enhanced livestock production technologies.

The CBSLSP leadership included international specialists, particularly the participatory extension specialist, working with staff from DLF, NAFRI, NAFES, and CIAT. CIAT and DLF managed the financial and administrative arrangements, through the Project office at DLF and the CIAT Regional Office in Vientiane.

3. OPERATIONALIZING PROJECT STRATEGIES

The previous section introduced the rationale for the pathway for livestock development, the extension approach, and the capacity building strategy. This section provides a brief overview of how this was operationalized throughout the life of CBSLSP.

3.1 Framework for intensification and staff capacity building

Farmers need to innovate specific production systems according to their resources and context. The approaches taken by farmers can be described in three robust steps of intensification. These are illustrated graphically in Figure 3.1 and Figure 3.2, with the interventions listed beneath them for four systems: pig fattening, pig breeding, ruminant fattening, and ruminant breeding.

In the course of the CBSLSP, these steps were used to set extension objectives for sites at different stages of development. Thus:

Sites in Year 1	→ entry point: the introduction of forages
Sites in Year 2	→ basic management: penning and basic animal health
Established sites	→ enhanced production: improved feed, selective breeding, full animal health

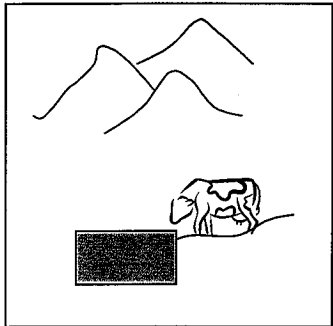
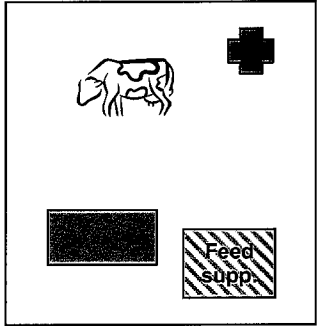
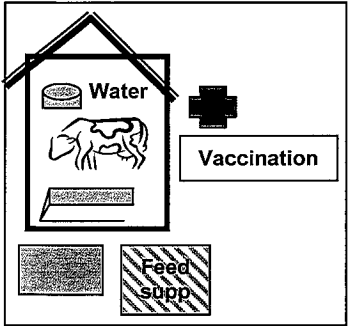
Thus, the first year focused on the introduction of forages as an accessible feed resource. With this established, in the second year, improved management practices were introduced. These two levels, or steps, of interventions were conducted in the trainee villages. Most importantly, this second level of intensification corresponds to the model as used by the NRSLLDP to calculate IRR. This would be achieved with adoption rates of 13% for pigs and 8.4% for ruminants across all target villages within the 6 years of the project⁶.

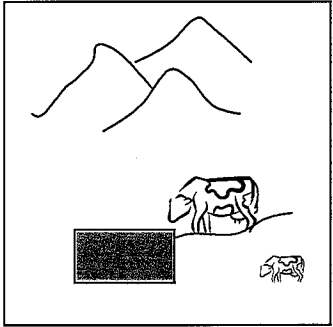
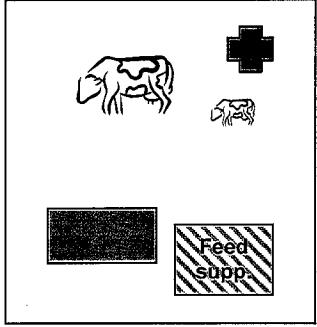
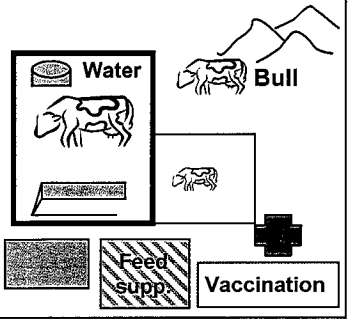
The third level of intensification goes beyond what is expected from the NRSLLDP. Nonetheless, it is still a legitimate objective for development of livestock production in the Lao PDR. This was the extension objective at mentor sites, where forages had already been established. The mentor staff aimed to first establish the second level of intensification, and move onto the third level.

These three levels of intensification also provide the guidelines for the capacity building of staff. Their skills and knowledge must match the level of intensification they are attempting to introduce to farmers. The capacity building inputs for the Trainee Staff, thus aimed to enable them to introduce forages to farmers in Year 1 and then gain management of livestock in Year 2. Training was not provided to Trainee Staff to enable them to conduct extension for level 3 intensification as they had not reached this stage. This level of work was, however, expected from the Mentor Staff. Supplementary training was provided to them for this, focusing mainly on extension methods for systems change and marketing methods for participatory assessment of market-chains.

⁶ Participatory Livestock Development Project ADB PPTA 4287-Lao, Final Report, p82.

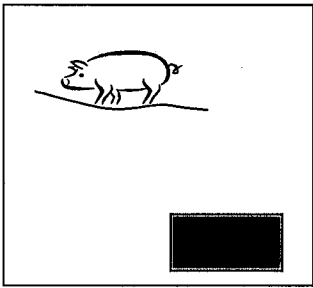
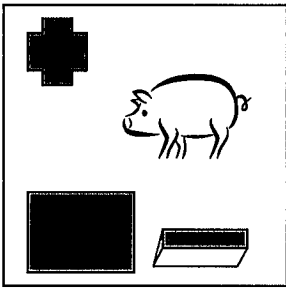
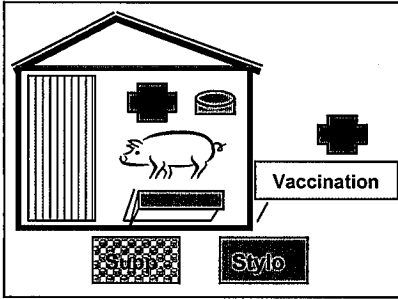
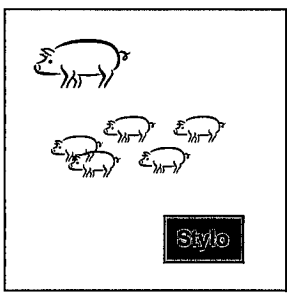
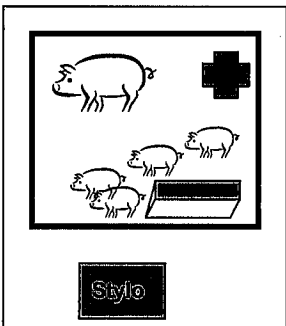
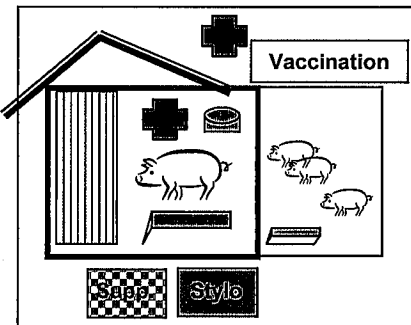
Figure 3.1 Cattle – Intensification Steps for (a) Fattening and (b) Breeding

	Intensification - Step 1 'Entry Point' (reducing labor)	Intensification - Step 2 'Basic Management' (increasing output)	Intensification - Step 3 'Enhance Production' (market orientation)
(a) FATTENING			
Feed	Forages grasses – reduce labor at peak	Forages grasses regular feed Forage legumes as supplement	SMART feeding (various supplemented at strategic time) + water <i>ad libitum</i>
Management		Confining (tethered, corralled)	Stalled (floor, roof, trough) Village quarantine
Health		De-worm	Vaccination

(b) BREEDING			
Feed	Forage grasses – reduce labor at specific times	Forages grasses regular feed. Forage legumes as supplement	SMART feeding Spike feeding for cow + water <i>ad libitum</i>
Management	-	Confining (tethered, corralled)	Stalled (floor, roof, trough) Weaning and spike feeding of cow Castration of young males Confining of bulls Selective breeding
Health	-	De-worm	Vaccination

Trainee 1	2006	2007	-
Trainee 2	2007	-	-
Mentor		2006	2007

Figure 3.2 Pigs - Intensification Steps for (a) Fattening and (b) Breeding

	Intensification - Step 1 'Entry Point' (reducing labor, easy feed)	Intensification - Step 2 'Basic Management' (increasing output)	Intensification - Step 3 'Enhance Production' (market orientation)
(a) FATTENING			
Feed	- Forage legumes: stylo for whole period	- Forage legumes: stylo for whole fattening period	- Feed supplements for carbohydrate (maize, cassava etc.) - water <i>ad libitum</i>
Management		- Pen / confine - feed trough	- Pens with floor, roof, trough - Village quarantine
Health		- De-worm	- Vaccination
(b) BREEDING			
Feed	- Forage legumes: stylo for whole period	- Forages legumes: stylo for whole period	- SMART feeding (maize, etc.) - Creep feeding for piglets - water <i>ad libitum</i>
Management	-	- Pen / confine - Feed trough	- Pens (floor, roof) - Nests for new born/ weaning - Castration of young males - Selective Breeding
Health	-	- De-worm	- Vaccination
Trainee 1	2006	2007 extension	-
Trainee 2	2007	-	-
Mentor		2006	2007

These three steps of intensification provide a framework for the planning for extension activities, and matched capacity building, and then indicators for the monitoring of changes in production systems and of staff capacity.

3.2 Phasing of project inputs

The project had three phases that are illustrated, along with the key inputs, in Figure 3.3.

Phase 1 Establishment

The Establishment Phase provided the basis for effective operation of the project. Criteria for selection of staff and sites were provided to local authorities and this was followed by site visits by the project team to each district to negotiate suitable selections. This took place in the first 3 months of project initiation (November / December 2005 and January 2006).

Phase 2 Entry for livestock development / staff engagement

The beginning of project activities proper in 2006 faced two challenges;

- (a) the interventions to be used (forages as an entry point to livestock development) was quite novel for both farmers and staff, and
- (b) staff themselves had little experience in conducting effective extension activities.

Thus the focus in the first year was to ensure that staff gained confidence in the technologies and in themselves so that they could work effectively.

Field work with extension activities was carried out in a limited number of villages to provide staff with the practical experience of extension activities, as well as establishing models of improved livestock production within the districts. In addition to two training workshops provided to the trainee staff, the use of mentor staff played a key role in the first year. A total of four mentoring trips were made. These ensured that trainee staff saw cases where forages had been established and were having an impact, and to observe extension staff who were working effectively with farmers.

Phase 3 Systems change / linking with NRSLLDP

In 2007, the second season of field activities, staff faced multiple extension challenges:

- (a) replication of the introductory activities to confirm they own capacity
- (b) expansion of forages to additional households within the first year villages
- (c) initiation of systems change to achieve Level 2 intensification (management of livestock).

The mentoring activities in 2006 succeeded in engaging the trainee staff to perform professionally and with commitment. Thus it was not necessary to continue these in 2007, however, trainee staff were exposed to more intensive livestock production systems and technology innovation through field visits to mentor villages as part of two training workshops.

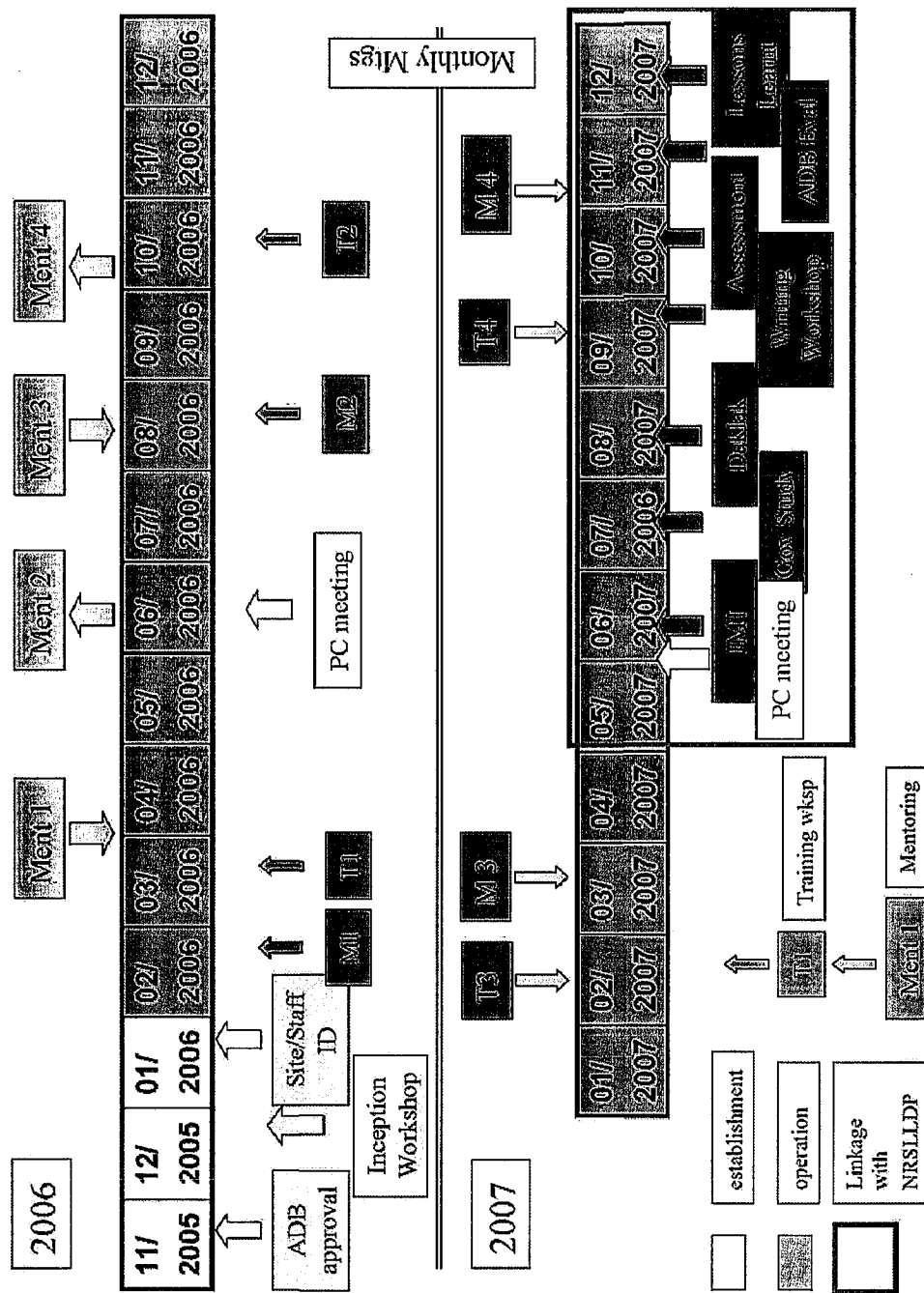


Figure 3.3 Phases and Inputs provided during operation of CBSLSP

In 2007, emphasis was placed on linking CBSLSP activities with the NRSLLDP. This was done through a series of activities:

- Joint Monitoring Trip: for DLF and NPD of NRSLLDP to illustrate the extension approaches and impacts being gained
- Study Trip to Daklak, Vietnam, for DLF and Heads of PAFO, to illustrate substantial economic impacts gained with consistent support
- Study Trip for district authorities for district Governors, and Heads of DAFEO to illustrate relation of livestock development with national development objectives (i.e. reduction of poverty and shifting cultivation) to ensure they support DAFEO staff in the field
- Attendance of NPD of NRSLLDP at Provincial Coordinators Meeting and Training Workshop for trainees and mentors
- External Assessments of (a) Impact on Production and Livelihoods and (b) Staff Capacity
- Lessons Learnt workshop, hosted by DLF for MAF and other agencies.
- Production of guidelines for extension workers (technical sheets; extension methods and 'Village Learning Activities).

These activities were additional activities beyond the original workplan of the project, and were funded through accessing some of the project contingency funds and re-aligning other budget lines through contract variations. These activities were regarded as necessary to ensure that there was both technical and political support for the approaches to be used, as they are still fairly innovative in Laos.

4. PROJECT ESTABLISHMENT

4.1 Initial Activities

The project was approved on November 8, 2005, with the starting date of 15 November, 2005. Initial project activities focused on (a) selection of target villages; (b) assignment of staff in trainee district and re-commitment of mentor staff in old FLSP district; (c) management procedures needed for project management. These had to be in place before capacity building and field activities could begin. There was a series of activities to put these into place.

(i) Review Meeting with DLF (28 November, 2005). CIAT and DLF met to review the structure and outline of activities of the project. This was held in the DLF office, on 28 November, 2005 and was attended by Mr. Somphanh (then Head, Planning and Co-operation, and now Deputy Director of DLF), Mr. Souriyasack, (then Deputy Head of Planning and designated Team leader for CBSLSP), and Rod Lefroy and John Connell of CIAT.

The meeting confirmed the selection of target districts according to the first cohort of 6 districts for the NRSLLDP. In particular the selection of Pha Oudom in Bokeo, and Vieng Phoukha in Luang Namtha was confirmed, while recognizing the difficulties and additional expenses involved in working in these two more distant districts.

(ii) Inception Workshop (Luang Prabang, 28-29 December, 2005). The selection of target villages and assignment of staff depended to a large degree on the understanding of the purpose of the project and agreement of DAFEO heads. The workshop was attended by 32 participants which included representatives from all 5 PAFO and Heads of 11 DAFEO from both the mentor and trainee districts.

The Inception Workshop outlined: (a) the objectives and framework for CBSLSP; (b) its links to and role in preparation for the NRSLLDP; (c) the mentoring strategy; (d) the main activities of the project; (e) inputs to be provided; and (f) management requirements. Criteria for the selection of villages and assignment of staff were provided (see 4.3.1).

(iii) Establishment Missions (8-17 January, 2006). It was not expected that the criteria for village and staff selection would be fully appreciated or adhered to from the Inception Workshop presentations. They provided a reference point only. Establishment Missions were made to each new District to discuss these in detail. Two teams were formed, comprised of staff assigned to CBSLSP and NAFRI staff who had participated in FLSP. In each district the basis for site selection was discussed and a field trip undertaken.

(iv) Field Review (13-18 February, 2006). A review mission of the progress of development of livestock production systems of a selection of 'old FLSP villages' was carried out in Xieng Ngeun and Pak Ou districts, in Luang Prabang Province and Paek and Nong Het districts in Xieng Khouang Province. This mission was conducted by the NPD, Mr. Souriyasack, Technical Support / Trainer, Mr. Bounthavong, Mr. Gavin Varney (TA for Livestock Management and Health) and Dr. Werner Stür (TA for Forage Agronomy), with Provincial Coordinators and respective DAFEO staff. Between two and four villages were visited in each district

that staff had selected as examples of both "excellent" and "poor" progress. This provided the team a picture of the range of current status of livestock production systems and provided the basis for the next level of interventions to be introduced into selected 'old FLSP villages' (see 4.3.2).

4.2 Staff assignment

The project aims to build capacity of staff at three levels: District, Provincial, and National levels. Staff were assigned or identified at all levels and worked in the field as required.

4.2.1 National Level

Two national level staff were assigned to the Project: the National Project Director (NPD) from DLF, and the Technical support/Trainer from NAFRI. Both these staff needed to gain an overall understanding of the working approach for development of livestock production and the strategy for capacity building based on mentoring, as well as their specific duties.

The NPD was responsible for management of the project, liaison with DLF and Provinces. On 15 July 2006, DLF, as the implementation agency, assigned Mr. Souriyasack Chayavong, Deputy Head of Planning as NPD. The technical support /trainer is responsible for arranging all training activities (workshops, mentoring and monthly meetings); review and advice in the field; and preparation of training materials and technical sheets. As the agency responsible for implementing the FLSP, NAFRI assigned Mr. Bounthavong Kounnavongsa to act as trainer and technical support. Mr. Bounthavong has little background in forages and livestock development, and so additional technical support was needed to prepare and conduct training workshops.

With the commencement of the project a Project Management Unit (PMU) was established in the DLF compound at Ban Khountha, Vientiane, and both these staff were based there (Annex 1, Table 1.1).

4.2.2 Provincial Level

The PAFO of all 5 provinces nominated staff as Provincial Coordinators for the project. They had the responsibilities to support DAFEO staff to carry out work as planned, to report on activities, and to disperse and manage funds. This included monthly supervision missions to the districts and coordination of monthly meetings. The provincial coordinators in all provinces were from the Livestock Sections of the PAFO, except in the case of Bokeo, where the coordinator is located in the Planning and Foreign Cooperation Section of the PAFO (Annex 1, Table 1.1).

In the case of Luang Prabang and Xieng Khouang, these were staff who had performed similar functions during the FLSP. They had additional duties as they became the hub for arranging mentoring trips, both for staff from their own districts to travel to the trainee districts, and for staff from these districts to come to work with DAFEO in their provinces.

4.2.3 District Level – Mentor staff

Mentor staff were the core of the mentoring approach to capacity building, through their (a) demonstration of extension approaches in the field; (b) articulation of technical issues; (c) demonstration of professional commitment to their job. Their on-going work in the old districts provided the framework for this training.

As the CBSLSP had started 5 months after FLSP had ended there was some concern that these staff would not be in place. Most staff who have gained training and experience can be quite mobile and are likely to be re-assigned to other duties. Thus the delay of the start up of the CBSLSP carried a high risk that the key resource of experienced staff would no longer be in place or be available. To cover the gap, CIAT mobilized additional funds to maintain staff in their positions. As a result, 22 of the 25 old FLSP staff were available to the CBSLSP (Annex 1, Table 1.2).

The duty for the mentors to provide support to trainee staff in their own districts carried a higher level of responsibility, both in terms of technical competence and responsibly for working independently outside of their own district. To perform this out-reach function, 12 senior mentors were selected; 2 from each of Luang Prabang, Xieng Ngeun, Pak Ou and Paek Districts, and 4 from Nong Het District. These are indicated by bold lettering in Table 1.2 of Annex 1.

4.2.4 District Level – Trainee Staff

The project aimed to train a total of 24 DAFEO staff in participatory approaches for livestock production. Six districts were nominated to participate in the first year of the NRSLLDP, and each of these could nominate 4 staff for training. In addition, these staff would then be responsible for implementation of these approaches in selected target villages. These field activities were necessary as part of their training, and also to establish models of improved livestock project, which the NRSLLDP can later use as examples for extension purposes

Guidelines for the selection of staff were provided to the DAFEO Heads during the Inception Workshop. These guidelines indicated the type of work they would do: work at village level; establish forages and work with improved livestock systems; plan and report on their activities; and their commitment of time (50-60%). The characteristics for selection of staff emphasized their capacity to work with farmers, rather than their technical background.

All six trainee Districts had been selected from the list of poorest Districts in the country. The DAFEO in most cases have had little exposure to project activities and their staff had little if any training or experience in extension activities. This 'rawness' was compounded by location in isolated areas of the North. As a result, there was some initial concern that trainee DAFEO would not be able to muster their full complement of 4 staff to assign to Project supported activities.

All DAFEO assigned a full complement of four staff in a timely manner, before the first training workshop held in March, (see Annex 1, Table 1.3). Of the 24 staff assigned, 9 are women, along with one of the Provincial Coordinators, Ms. Cheam, from Luang Namtha). Most have had basic academic training in livestock and about half were permanent staff with the others being contract staff of the DAFEO.

Since beginning activities there were 7 changes, as indicated in Annex 1, Table 1.3. Those changed in 2006 were able to catch up enough to work effectively within their teams, however, the two staff changed in Pa Oudom in November 2007 and the removal of one staff in Khoun represented gaps for those districts.

4.3 Site Selection – new districts.

4.3.1 Criteria for selection of Target Villages

At the District level, the project aimed to train 4 staff in each DAFEO. The number of target villages for field activities was based on a ratio of staff to villages of 1:1. As the trainee staff work in teams of two, this meant each that each team was responsible for 2 villages. This was done so as: (a) the two DAFEO could support each other, and balance variations in natural abilities; and (b) to allow the team to test their skills in each extension activity in the first village and to then re-apply and improve in the second village. With the assignment of the full complement of 4 staff per DAFEO, it was possible to select 4 villages for implementation in 2006.

Selection of appropriate villages is a critical activity, as selection of inappropriate villages can prejudice results from the outset. Guidelines for selection of villages were provided in the Inception Workshop. These criteria are important and are elaborated here;

- (a) Villages already raise livestock and livestock are important to their livelihoods.
This may seem superfluous, but was included to avoid inappropriate selection, such as villages lacking livestock (in the hope that the project will provide animals), or villages close to main road whose main activity is trading, etc.
- (b) Feed for livestock is already a constraint. Villages with extensive grazing do not see the need to change, whereas villages pressured by feed constraints will be open to the use of planted forages, which is the entry point to managed animals and improved productivity.
- (c) Villages in a cluster. This avoids the tendency to spread 'benefits' of projects as widely as possible, with villages scattered across the district. Villages within a cluster result in more efficient travel of staff into and out of the area, and allows networking between villages.
- (d) Accessible.
To establish new activities, target villages should be selected that staff can travel to in all seasons without great difficulty, risk or expense.

During the Establishment Mission a number of Districts were found to have selected quite inappropriate villages, including; villages with few livestock (*"in the hope that the project was to provide livestock"*); overlapping with other projects (although this was acceptable in some cases); and in scattered locations, etc. The Establishment Mission reviewed the criteria with the DAFEO, examined secondary data and made field trips. This resulted in the final selection of villages with suitable characteristics. The list of villages, with a broad set of characteristics, along with district maps, is provided in Annex 2 (Table 2.1 and Figure 2.1).

Village sizes varied from 32 to nearly 150 households, with people from 9 different ethnic groups. For most of the districts, the target villages were selected in clusters to facilitate networking and exchange. They included villages that had production systems that were predominantly swidden-based and predominantly paddy-based systems. In most areas, farmers still have access to extensive grazing for their

livestock, however, there are significant constraints to the maintenance or expansion of these areas due to the expansion of cash crops, such as maize in Bokeo, and rubber in Luang Namtha. In these cases, local regulations are developing where farmers are heavily fined if their animals damage the cash crops, and this may result in farmers having to reduce livestock numbers.

4.3.2 Characterization of traditional livestock systems and issues.

Assessments of existing livestock practices in new districts were carried out by the National Project Director, the Technical Support Trainer, and the Animal Health and Management Specialist, and involved PAFO and DAFEO staff. This confirmed the results and conclusions of the Livestock System Survey and Technical Options (PPTA Final Report, Appendix 4) and affirmed the phasing of the introduction of interventions. The teams visited 7 villages to consult with farmers and discuss livestock health and management issues and options.

The field reports provide descriptions of the village production systems. These are included in full in Annex 2 (Table 2.3) with key characteristics summarized in Table 2.4. These 'cases' will be used as 'benchmarks' to indicate the degree of systems change that should occur from the project and NRSLLDP as it continues to work in these districts.

The most common animals raised were cattle, buffalo, pigs and poultry, but the weight or preference given to each species varied across sites. For instance, one village raised no cattle, only buffalo⁷, and another where pig raising had almost disappeared⁸. In five villages there were households that raised goats, two villages kept horses, and another had fish ponds.

As found in the Livestock System Survey, in all six sites, livestock production was based on extensive management of animals, however, each had significant issues with feed for at least part of the year, high mortality of animals caused by disease epidemics (particularly poultry and pigs), and, in particular, high mortality of buffalo calves.

While there were common characteristics across the 6 sites, the specific conditions and characteristics varied. It is these specific issues that can affect the entry points. The local geography and competing land use have the greatest affect on the livestock systems of villages. Both Phonexay and Viengxay sites were the closest to being pure upland systems. In both these sites farmers were the most satisfied with feed from natural resources, and so demand for planted forages for cattle was low. In the other districts, farmers felt that there was insufficient grazing for a range of reasons, specifically an increase in the herd size and cash crops occupying increasing amounts of land.

All villages had defined grazing areas within a few hours walk from the villages, where animals were kept to graze free-range. Farmer inputs to manage this varied from checking once or twice a week, villagers remaining with the herd, or supervised grazing. Cropping in Pha Oudom, Bokeo, is so extensive that buffalo are supervised while they graze and then returned to the village in the evening, thus

⁷ Donxay village, which preferred buffalo

⁸ Nalam village, regulations for confinement of pigs have resulted in poor growth and so households have ceased raising pigs.

creating a new burden on family labor. In Nalam, a Hmong village in Xieng Khouang, farmers also keep cattle (fighting bulls) in pens. It is a short step from this system to fattening cattle, as has occurred in 'old FSLP villages'.

District regulations in four sites restrict free grazing of animals to protect areas of cash cropping. While this is hard for farmers used to free grazing of both cattle and pigs, it promotes the use of pens and confined areas; a first step towards controlling the spread of disease. Also, it means that farmers then require accessible feed, making planted forages particularly attractive. These are factors that will help the introduction of improved feeding and management practices by the NRSLLDP.

Disease kills some large animals every year in most villages with occasional epidemics (for instance of Hemorrhagic septicemia) being reported. In six out of seven villages, farmers reported high mortality of buffalo calves, up to 50%, due to toxacara. As identified in the PPTA, this is easy to prevent through simple and inexpensive treatment. Indeed, one village, Nalam in Xieng Khouang, was already treating their animals and reported zero losses since the introduction of this simple technology.

All villages raised local pig breeds (*Muu lart* and *Muu lao sung*). In all villages, many farmers buy one to three piglets from other farmers and fatten the pigs in pens, while some households are doing both fattening and producing piglets. Piglet productivity is low, with the norm being one litter per year producing seven to eight piglets, with only three to five surviving due to loss, cold, smothering by the sow, etc. Thus, just in piglet production there is a 30% loss, mainly as a result of poor housing. With inadequate feed, pigs are free to scavenge, allowing contact with other pigs. Nearly all sites suffered CSF (Classical Swine Fever) outbreaks, which kills 30% of the remaining herd. The exception to this was Viengxay district where there was good housing and adequate feed.

Feed is poor, mainly carbohydrate and fiber, lacking in protein. Consequently growth rates are low, taking 12 months for pigs to reach 40-50 kg. Women provide the feed, requiring 2-3 hrs each day to collect, cook and feed the pigs. Introduction of Stylo as a protein supplement, improved housing, de-worming of pigs going into fattening pens, and improved knowledge about disease management were identified as priorities.

Goats were raised in five of the seven villages visited. Although only a few households raised goats in these villages, it is clearly a production system that is likely to increase with time. Goats graze during the day and return to the village at night. No major problems were reported, largely because goat density is still low in these villages. As more farmers start to grow goats, problems such as crop damage and parasite problems are likely to arise.

4.4 Lessons Learnt - establishment of project activities

Staff identification:

Identification of staff was not a problem. In fact, DAFEO Heads do not have a large pool from which they can select. When NRSLLDP initiates work in new target districts, it will be worthwhile:

- providing clear criteria for selection of suitable staff,
- indicating a preference for staff with a technical background in livestock, but

to give a higher emphasis for staff who work effectively with farmers (in other words, a non-livestock staff member who works effectively with farmers should be chosen over a livestock staff member who does not work well with farmers).

Site identification:

There is a tendency for DAFEO heads to nominate target villages for a range of non-project-related reasons, which can confound project activities. It should be remembered that providing criteria and expecting the DAFEO to apply these is not enough. It is necessary to make site visits to discuss selection of initial villages in a new district with the DAFEO heads, in the context of each site. Thus, when NRSLLDP initiates work in new districts it should consider the following:

- Provide criteria for identification of target villages (see section 4.3.1)
- Conduct 'establishment missions' to negotiate directly with DAFEO heads as to which are the appropriate villages for the first round of project activities
- Review the selection before field activities begin
- Obtain basic background data sets to include: (a) the total number of households, (b) the number of each type of animal in the village; (c) the percentage of households owning each type of animal; (d) ethnicity; (e) basis of production (paddy/upland); (f) the management characteristics for livestock; and (g) access to roads and markets.

5. FIELD WORK 2006

Field work was funded by CBSLSP in both old FLSP (mentor) districts and trainee districts. Implementation of extension activities following workshops was an essential part of the capacity building process. The field work in mentor districts played two roles (a) as a platform to expose trainee staff to effective extension work, and (b) to establish models of more integrated livestock production..

5.1 Trainee Districts

5.1.1 District Forages Nurseries

The establishment of forage plots from cuttings has technical advantages over establishment from seed. While seed is a convenient means to distribute planting material, establishment from seed requires land to be well prepared, care in seeding (so as not to over-seed or seed too deeply), and risks from washouts in the event of heavy rain, or premature death in the event of drought. Establishment from seed cannot begin until the wet season is well advanced (usually June). This allows only a few months of good growth before the dry season, thus limiting the time forages can be harvested for use as feed to 1-2 months. This makes it difficult for farmers to observe improvements in livestock condition in the first year, with substantial benefits delayed until the following year. This requires far too much patience and commitment by farmers.

Forage nurseries can be established earlier in the year with supplementary irrigation, to provide cuttings to transplant with the first rains as early as April / May. Plots established from cuttings can begin to be harvested quickly, often within a month, thus providing a longer period to have impact on livestock performance.

This extended period of use of forages for new farmers was considered a worthwhile justification to attempt to use forage nurseries to provide cuttings to farmers. This approach to 'jump-start' the use of forages using forage nurseries had not been used before in the Lao PDR. Thus their application within the CBSLSP represented a trial of this approach.

DAFEO staff established forage nurseries in April 2006, on return from the first Trainee Workshop. Mentor staff made the first trip to guide staff in this activity, as well as to mentor the PRA/PD implementation. Nursery sites were selected primarily to have access to water for supplementary irrigation. The nurseries included six forage species: *Andropogon gayanus* 'Gamba', *Brachiaria brizantha* 'Marandu', *Brachiaria hybrid* 'Mulato', *Panicum maximum* 'Simuang', *Paspalum atratum* 'Terenos', and *Stylosanthes guianensis* 'Stylo 184' with a total area of 1600 m². Inputs provided included seed, fertilizer to facilitate more rapid growth, and barbed wire for fencing. The management of the nurseries varied, with some districts contracting farmers, while others arranged for the DAFEO staff themselves to establish and manage the nurseries (Annex 3).

Of these two approaches it was clear that plots were better managed by farmers who were more consistent and effective in their weeding and watering of the nurseries.

5.1.2 Field activities to introduce improved livestock systems

The key activities for the introduction of villagers to managed livestock systems through forages in each target village followed these steps:

- General Participatory Rural Appraisal (PRA) as an introduction to the general conditions of the village
- Livestock specific Problem Diagnosis (PD) to identify the underlying livestock system and associated constraints, with special attention to feeding
- Selection of 'focus group' farmers to use forages on a trial basis
- Introduction of forages to focus group farmers
- Follow-up on establishment
- Follow-up on use of forages for feeding
- Focus Group meeting
- Village Exchange meeting

These steps are described in detail in a CIAT publication⁹ and are consistent with the Lao Extension Approach (LEA), which is the standard extension method used by DAFEO.

Mentor staff guided the trainee staff when they conducted PRA and PD in two of the four target villages. Trainee staff then conducted these activities independently in the remaining two target villages. PRA reports showed that staff tended to focus on large animals (cattle and buffalo). This was despite pigs being raised by almost all households. This focus was adjusted later in the season during a monitoring mission by the NPD and the Extension TA.

Each village selected a 'focus group' of farmers (five per village), who would use forages as an additional feed source for their livestock. The focus group farmers selected and prepared areas for establishing their forages. Establishment of forages was conducted in July, following a trip to the mentor districts by trainee staff that focused on plot establishment and forage use. Sufficient seed plus cuttings from the district nurseries were provided to farmers so that they could each establish 400 m².

Follow-up during the first two months, when the plots did not produce any feed, was critical so as to ensure that farmers maintained their forage plots to the point that they could begin to harvest and feed their animals. Follow-up was also important to ensure farmers began to harvest and use the forage feed as soon as possible. Even when forages were available it was common for farmers to delay using this unfamiliar feed source. This was the case in Pha Oudom and Vieng Phoukha districts and this was corrected by the July monitoring trip conducted by the Animal Health and Management advisor and mentors, resulting in no serious delays.

As improvements in livestock condition began to emerge, staff took note of these through dialogue with the farmers during follow-up visits. Following the second Trainee Workshop, staff conducted Focus Group Meetings. The focus group farmers shared their experiences, resulting in these being consolidated as lessons learnt within the group. The experiences and lessons were then used as the basis to conduct Village Exchange Meetings. These were key events in each village that led to scaling up of activities. Mentor staff joined the first of these key meetings to guide the trainee staff in conducting effective meetings.

⁹ "Developing agricultural solutions with smallholder farmers: how to get started with participatory approaches", Peter Horne and Werner Stur, ACIAR Monograph No 99.

5.1.3 Results for 2006

5.1.3.1 District Forage Nurseries

Characteristics of the nursery establishment were:

- Overall sites were well selected, with access to water, except for Khoun¹⁰.
- Seeding was too dense (even though supervised by mentors).
- Germination was good, except for Gamba (poor germination across sites)
- Weeding and irrigation of the plots was poor when performed by the DAFEO staff, resulting in uneven establishment and growth
- Livestock damage was not a problem due to good fencing.

As a result of these various factors, the area of the nurseries that could yield cuttings was reduced for the intended 1600 m² to about half. Once established, the nurseries were effective as demonstration plots. Farmers in the target villages visited the nurseries, and took samples back to their villages. The small area arguably stimulated farmers to put more effort into establishing their own plots.

In all districts except Khoun, the established nurseries provided forage cuttings for farmers in the target villages (Annex 3, Table 3.1). Dispersal of cuttings to farmers was mainly in July. Time from establishment of the nurseries to dispersal was 3 months. This was enough time for development of cuttings that could be harvested.

The area of forages established from cuttings was not large, being about 100 m² per household. This was less than the expected area that should have resulted from the effective 800 m² of nursery; it should have been about five-times this area.

Factors leading to this were:

- Poor selection of cuttings
- Loss of viable cuttings due to poor coordination between farmers in the preparation of fields and collection of cuttings
- Poor treatment of cuttings (squashed in bags, bags left in the sun)
- Farmers transplanted roughly, or transplanted into dry areas.

Thus the District Forage Nurseries did not lead to a significant enough area for a 'jump-start' in the use of forages, however, there were not without benefits. The nurseries;

- a) Were important for the new DAFEO staff, providing them with concrete activities to perform early in the season, and exposing them to forages before they had to introduce them to farmers. It is difficult to imagine that they could have done this with confidence without having worked first with the District Forage Nurseries.
- b) They provided a demonstration of forages for the Focus Group farmers for whom planting of feed for livestock was initially a strange idea.
- c) It introduced the idea of cuttings to farmers from the outset and thus led to those farmers wishing to expand their areas, doing so without any delay.

For these reasons the district nurseries were a worthwhile initiative and should be conducted when initiating new districts, however, once forages have been

¹⁰ The site in Khoun had poor soil which inhibited growth to the extent that no output was obtained and a second supply of cuttings was purchased locally and provided for farmers to replant.

established in a district, they need not be continued as an extension mechanism¹¹.

5.1.3.2 Establishment of forages in farmers' fields, 2006

The first challenge for extension workers was to find the entry point for forages at each site, and to gain the interest of four or five farmers to trial the use of forages. This cannot be taken for granted for an intervention as novel as planted forages for cut and carry. In all but three of the 24 target villages, staff succeeded in finding this entry point. Compared to the initial plan of 120 farmers, 112 farmers established forages. In all but one village there was at least one farmer whose forage plots were established well enough to provide sufficient forages to feed their livestock on a trial basis. These farmers provided a model for other farmers in the village. The levels of effective plot establishment are given in Figure 5.1, which illustrates that by October 2006, examples of effective plots and use (highlighted cells) had been achieved in all districts except Vieng Phoukha.

The sites that farmers selected for their forage plots were generally good, with few of the problems encountered in the early years of FLSP such as steep slopes, flood prone areas, and heavy shade. The actual areas established by farmers were lower than planned (400 m²), typically about 200 m², due to problems with 'over-seeding', and poor emergence. In the past, these problems have been ubiquitous in the first year, despite the emphasis given in training. Having said this, the consistency of plot establishment in the trainee districts was far better than was gained in the first year of the FLSP, with only 10 farmers who planted forages having failed plots. Some problems were due to poor germination of one of the forage species distributed, 'Gamba'. Details of the establishment of farmers' forage plots for each village are described in Annex 3, Table 3.2.

Impact from the use of forages was far more variable. Results in Pha Oudom and Vieng Phoukha districts were quite poor, with only two farmers across both districts obtaining significant improvements in livestock condition. These two districts had been a concern from the start due to their isolation; both the difficulty of access by the Provincial Coordinator and the lack of any partner DAFEO to interact with in monthly meetings. The lack of use of forages by farmers who had established substantial plots (in Pha Oudom indicated by '0') should also be noted. Staff can play a useful role in ensuring farmers not only grow but harvest and use their forages as early as possible.

In the other four districts, the use of forages by farmers was fairly consistent, with nearly all villages having a farmer using forages to a significant level, and a few households within the district gaining significant impacts (Annex 3, Table 3.3a). The level of use was quite impressive. Forages seeds and cuttings were planted in July, and yet during the reporting after the second Trainee Workshop, in October, when there had been just one or two months after establishment to harvest and use the forages, there were already reports of significant use and impacts emerging.

¹¹ In contrast to the demonstration and extension role of district nurseries, there is a very real role for forage nurseries as an enterprise. If such nurseries are established and managed by farmers and the cuttings sold to their neighbours, the nurseries play a key role in accelerating distribution of forage planting materials and, at the same time, provide embedded extension advice. Thus establishment of forage nurseries should be supported at later stages of the NRSLLDP as SMEs.

DISTRICT	Farmer 1	Farmer 2	Farmer 3	Farmer 4	Farmer 5
Pha Oudom					
Xay Oudom	++ / ✓	-	-	-	-
	+ / 0	+ / 0	++ / 0	++ / 0	+ / 0
Hadkham	++ / ✓✓	++ / 0	++ / 0	++ / 0	++ / 0
Nahome	++ / ✓✓	++ / ✓	++ / ✓	++ / 0	-
Vieng Phoukha					
Namkiang	++ / ✓	++ / ✓	++ / ✓	+ / ✓	+ / ✓
Nongkham	++ / ✓	++ / ✓	+ / ✓	+ / ✓	-
Nam O	+ / ✓	++ / ✓	++ / ✓	- / ✓	- / ✓
Phonethong	+ / ✓	++ / ✓	++ / ✓	- / ✓	-
Phonexay					
Donexay	++ / ✓✓	++ / ✓	+ / ✓✓	+ / ✓	+ / ✓
Houaysignua	++ / ✓✓	++ / ✓	++ / ✓✓	++ / ✓✓	++ / ✓✓
Phakhok	+ / ✓	+ / ✓✓	+ / ✓✓	+ / ✓	++ / ✓
Houameuang	+ / ✓✓	+ / ✓	++ / ✓	++ / ✓	++ / ✓
Khoun					
Namlanh	++ / ✓✓	++ / ✓✓	++ / ✓✓	+ / ✓✓	+ / ✓
Nalam	+ / ✓	+ / ✓	+ / ✓	+ / ✓✓	++ / ✓✓
Thenephoun	+ / ✓	++ / ✓✓	++ / ✓✓	++ / ✓✓	+ / ✓
Siviengkham	++ / ✓✓	++ / ✓✓	++ / ✓✓	++ / ✓✓	++ / ✓✓
Vieng Thong					
Namneun	+ / ✓✓	+ / ✓	- / ✓	++ / ✓✓	++ / ✓✓
Bouamfad	+ / ✓	+ / ✓	++ / ✓	+ / ✓	++ / ✓
Meuanghiam	+ / 0	+ / 0	++ / ✓✓	++ / ✓✓	
Samphanthong	+ / ✓	++ / ✓✓	+ / ✓	+ / 0	+ / ✓
Viengxay					
Nakhao	++ / 0	+ / ✓✓	++ / ✓✓	+ / ✓✓	+ / ✓
Phoukang	- / ✓	- / ✓	+ / ✓		
Kangpabong	+ / ✓	- / ✓	+ / ✓✓	+ / ✓✓	+ / ✓
Phounneua	+ / ✓	+ / ✓✓	++ / ✓✓	+ / ✓	

Plot Establishment

(-) poor establishment: insufficient forages to use for feeding;
 (+) satisfactory establishment: adequate forages for feeding;
 (++) good establishment: substantial forages for feeding.

Use of forages:

(0) not used for feeding;
 (✓) used for feeding, but not to a significant degree
 (✓✓) significant use of forages, with improved condition of livestock

Figure 5.1 Engagement of farmers in first year, Y2006, (October 2006)

Following the workshop, staff conducted further dialogue with farmers. By the time Village Exchange Meetings were conducted two months later (December

2006), more advanced results had been gained, which are recorded in detail for each village (Annex 3, Table 3.3a). An indicative synthesis of these results is provided below.

Fattening	- 2 villages in 2 districts (Khoun, Viengthong)
Animals closer to house	- many villages in nearly all districts,
Pigs kept in pens	- 4 villages (Viengxay)
Feeding goats	- 5 villages (Vieng Phoukha, Phonexay, Viengthong)
Feeding fish	- 2 village (Viengthong, Phonexay)
Expansion of forage area	- 3 villages (Khoun, Viengxay)

Where these practices were applied, observable changes in livestock condition were gained. A few of these (Hua Meuang, Phonexay) can further illustrate the results:

- One farmer found that by mixing stylo (1:3) with the one 'galong' (5 kg¹²) of bran that she normally feed to her three pigs, the time to use the full 'galong' of bran increased from two to four or five days.
- A second farmer found that by adding stylo to bran he achieved a rapid weight gain of 40 to 60 kg within 2 months, compared to the former norm of one year to reach 50kg

When related in Village Exchange Meetings, these provided tangible results that were more meaningful to other farmers and so they became interested in starting to plant forages in 2007.

Following the 2nd Trainee Workshop, staff conducted Focus Group Meetings, in which farmers within the group consolidated their experiences. This was followed by a Village Exchange/Planning Meetings where the focus group members reported on their results. This was a key event to establish expansion of adoption of forages for the following year, 2007. These meetings were well attended with about 50% of households across all sites attending. Of those attending, 40% indicated they would grow forages in 2007, making a proposed additional 374 households. Together with the 112 farmers already growing forages, the adoption rate by 2007 of the use of forages as the entry point for improved livestock production appeared to be about 30% of the village populations. This is quite a high level of adoption for any extension intervention (see Table 5.2), and exceptionally high for a technology such as forages that is such a departure from the norm, and in itself a prelude to systems change. In their provisional plans, farmers indicated they intend to use forages to feed not only ruminants and pigs, but also goats, and poultry.

5.1.4 Extension objectives – Year 2 (2007).

5.1.4.1 Strategies.

Field activities of 2006 had established examples of: (a) farmers' cultivation of forages in small plots; (b) use of forages as feed, and (c) initial systems change of managed livestock production. Each of the 24 target villages had examples of forage production that staff could use as models from which new farmers could learn. Following the workshop in October, staff from Pha Oudom and Vieng Phoukha corrected the weak performance in these districts and gained substantial use of

¹² Cost of bran in the village was approximately 1000 kip per kg (\$0.1/kg)

existing forage plots.

The extension activities planned for 2007 were based firstly on staff needs for further levels of capacity, rather than on expansion of results. The key areas for capacity building were:

- i. expansion of forages from the initial five households to other interested households within a village. This demonstrated the principal of expansion from a 'few' to a larger number of farmers, and required staff to work with 'groups' rather than individual farmers, including the management of cross-visits.
- ii. intensification of livestock production systems, including confinement of animals, fattening, and simple animal health interventions, all of which were enabled by forages. This involved additional technical skills and led to systems change.
- iii. introduction of forages to new villages

Activities (i) and (ii) were planned for all 24 of the villages in 2006. The introduction of more intensive production components was limited to just a few of the households as examples to other households. In addition, it was important to consolidate trainee staff capacity to carry out the introductory extension activities, which they had carried out in 2006 with mentor support. Thus activity (iii) was carried out in two additional villages per district (i.e. one additional village per team). The expansion of new villages was deliberately limited to keep the focus of work on activities (i) and (ii) where new learning experiences were to be gained.

5.1.4.2 Field Activities

Staff conducted Village Planning Meetings in the Y2006-villages to confirm the provisional plans made at the end of the previous year. These planning meetings had two outputs: (a) the number of new households who wished to establish forage plots, and (b) those households who wished to intensify their production systems. These planning activities were facilitated by flip charts with each component of intensified systems illustrated, and with space for the Y2006-farmers to list their names, if interested, e.g. *"what various components would assist in weight gain"*. This helped both staff and farmers think in terms of production systems rather than technologies.

With the large number of farmers in the Y2006-villages wishing to establish forages, staff could no longer interact with each farmer one-by-one. Thus during the Village Planning Meeting small groups were formed by staff. These were composed of between five and six households clustered around experienced farmers. Throughout the season, staff were then able to interact with farmers as a group, and at the same time, were able to devolve some responsibility to the Y2006-farmers to advise new farmers, based on their experience the previous year. Staff made follow-up visits to each village, with a frequency in most months of twice per month, to focus on both establishment of forage areas with new farmers and working with the 'old farmers' who were beginning to use more intensive systems (i.e. level 2 intensification).

A series of cross visits were facilitated for selected farmers late in the year once more intensive systems had been established. These included cross visits within the 6 villages of each district, to villages where the best example of livestock production had been established, and visit to mentor districts where intensification had progressed to level 3.

Introductory activities in the new villages followed the same process used in 2006. Mentors joined the staff in one village, with trainee staff then continuing the work by themselves.

The project provided seed to the new farmers in both Y2006-villages and the new Y2007-villages to enable the planting of plots of 20 m x 40 m. No further use was made of the forage nurseries to supply cuttings to new or old villages¹³. The area planted by each farmer was greater than in 2006 and aimed to provide sufficient forages for feeding, while not being a burden to establish while forages were still being piloted. Farmers could expand using cuttings if they needed more. Based on the preferences and performances of the forages in 2006, the forage varieties provided were reduced to four species: Stylo, Mulato, Marandu and Simuang.

It is important that projects do not supply so much planting material to farmers that it is 'devalued'. To enable a dynamic expansion of forages in subsequent years, it is in the interest of a project to stimulate local exchange, or sale of planting materials, both seed and cuttings. Thus sufficient seed should be supplied so that farmers have sufficient forages to feed their animals and gain some effect, but not so much that they would not expand their plots themselves or seek additional material from other farmers. While forages have been introduced to these districts already, the high demand far outstrips the capacity of existing farmers to supply sufficient quantity, especially as their first wish is to expand their own areas of forages for their own use.

5.1.5 Results (2007)

Three types of results are presented: (a) expansion of forages, as the precursor to intensification; (b) changes in production systems enabled by forages; (c) impacts emerging in animal productivity and household livelihoods.

5.1.5.1 Expansion of forages areas

There was a significant expansion of both the number of households and the area of forages planted in 2007. Within the villages initiated in 2006, an additional 265 households planted forages. This was somewhat less than the 374 households projected in the Village Exchange Meetings held in late 2006, but nonetheless a very significant expansion. Combined with the original 112 households, this represents an adoption rate of 22% of households across all the 24 Y2006-villages (Table 5.1).

In the two additional villages initiated in each district in 2007, adoption of forages was far more rapid than had been gained in the previous year. In the first year, the number of households supported was deliberately limited to five households to ensure staff had a manageable load while they were becoming familiar with livestock extension. This restriction on numbers of interested farmers was lifted for 2007. The number of households in the Y2007 villages was typically 10 households per village, with some having 20 or more. This is equivalent to 25 % of all households. Thus the Y2007 villages have 'caught up' with the Y2006 villages and the level of activity in both was more or less the same.

This accelerated adoption was due to both the existence of examples within the district, and staff confidence in the intervention of forages, and their own capacity.

¹³ In some cases the nurseries still existed and the farmers collected cuttings to expand the planted area, or distribute to other farmers.

With impacts already emerging in each district, staff would have been able to express the benefits of forages in more terms of increased weight gain, higher prices gained and so on. These would have been more compelling than technical explanations of the function of forages.

Table 5.1 Expansion of forages in both Y2006 and Y2007 villages

Province	District	Village	HH	2006	2007		
				No. HH with forages	No. HH with forages	Area of forages (m ²)	Area /HH
Bokeo	POD	Xay Oudom	137	1	17	6,800	400
		Hadkham	32	6	12	4,800	400
		Nahome	37	4	19	6,500	342
		Xaysavang	48	5	8	2,950	369
		Donekeo	55	-	10	4,000	400
		Pengthong	122	-	16	6,425	402
Luang Namtha	VPK	Namkiang	47	5	20	5,642	282
		Nongkham	112	5	10	2,457	246
		Nam O	150	5	17	7,459	439
		Phonethong	85	5	18	4,900	272
		Phadaeng	50	-	9	2,075	231
		Lailot	65	-	20	4,130	207
Luang Prabang	PHX	Donexay	73	5	23	11,225	488
		Houaysignua	98	5	10	2,670	267
		Phakhok	88	5	13	6,115	470
		Houameuang	81	5	15	5,800	387
		Sopchia	72	-	9	2,525	281
		Paknaa	126	-	12	8,775	731
Houaphanh	VIX	Nakhao	56	4	18	13,118	729
		Phounkang	30	5	12	4,660	388
		Kangpabong	68	5	12	4,300	358
		Phonneua	32	3	7	2,300	329
		Longkou	43	-	10	34,000	3,400
		Viengphanh	92	-	5	3,024	605
	VIT	Namneun	48	4	6	2,870	478
		Bouamfad	32	5	10	3,953	395
		Meuanghiam	48	5	24	9,600	400
		Samphanhthong	78	5	11	5,002	455
		Kokieng	71	=	39	14,427	370
		Nampung	65	-	13	4,780	398
Xiang Khouang	KHO	Namlanh	41	5	26	26,700	1,027
		Nalam	80	5	15	14,247	950
		Thenephoun	76	5	20	21,550	1,078
		Siviengkham	56	5	19	7,850	413
		Phoumoungmeuang	102	-	19	14,353	755
		Sanking	66	-	28	17,851	638
TOTAL			2564	112	556	299,833	550

Across all 36 villages there were a total of 556 households planting forages as surveyed by staff in November 2007. The total area of forages was estimated as 22.4 ha. Typically, the area of forages planted was about 500 m² / household. This is low considering that seed to plant 800 m² was distributed to all households, however,

farmers typically used a high seed rate, of at least twice the recommended rate, a problem that appears difficult to avoid in the first year. This 'inefficiency' is not a serious problem, as long as staff use it as a learning exercise. Subsequent expansion is generally from cuttings, which does not have this problem.

It is possible for projects to drive 'adoption', through the supply of planting materials, which is not sustained beyond the life of the project. This does not appear to be the case here as expansion was based on vegetative cuttings by the farmers themselves. Adoption data were confirmed through the visits of the NPD and TA to all sites. The care with which the plots were managed indicated that farmers valued the forages. Furthermore, in most sites there were farmers who had expanded their forage areas within the first season. In some villages farmers have already expanded to over 1 ha of forages to meet their needs. Such dynamic expansion clearly indicates that the adoption is real, and not an artefact of project inputs.

Such a high adoption rate is unusual for any technical intervention, and exceptionally so for one as novel as planted forages. The introduction of forages to reduce labour for feeding their livestock has a general appeal, and once impacts become evident, farmers are keen to use forages even more. At the same time, there are few technical or economic barriers to farmers establishing areas of forages. While there are a few pitfalls (e.g. high seed rates), such errors are rarely serious enough to prevent farmers from having enough forage material to begin feeding their animals on a trial basis.

5.1.5.2 Use of forages and changes in production systems

The use of forages has been greater for pigs than for ruminants, with the number of households using forages for raising pigs being about 50% greater than for ruminants (Annex 3, Table 3.3b). In a few villages the use of forages has been predominantly for pigs, with only one or two households using them for cattle and/or buffalo. Only in Khoun district, Xieng Khouang, are the households using forages for raising cattle greater than those using them for pigs. This was influenced by the previous work of FLSP and the interest of the Hmong ethnic group in cattle.

While it was not targeted directly, a significant number of villages have also extended the use of forages to other livestock species. This has occurred in almost all districts, but mainly in Vieng Phoukha and Phonexay and predominantly with poultry. Some use has also been for fish, mainly in Viengxay, and for goats in Phonexay.

By providing an accessible feed, forages allow a number of other interventions to be employed. Changes in production systems had already appeared in a few instances in the previous year. By the end of 2007, this had begun to occur in almost every village in some way. While this is predominately happening in the Y2006-villages, where forages were well established, it also happened in Y2007-villages.

The key intensification factors for pigs included the feeding of Stylo, penning, improved feed troughs, and de-worming. The average adoption rate for forages was 25% of all households in a village. For pig raising, more than half of these farmers (or 15% of all households) have progressed beyond forages, and begun application of improved management (see Annex 3, Table 3.5b)¹⁴. In a few villages the

¹⁴ Intensification was recorded when:

Feed: forages were a regular part of the diet, rather than used occasionally to resolve labor constraints.
Management: animals were confined or penned

intensification for pigs almost kept pace with the rate of forage adoption (e.g. 30-40% in Vieng Phoukha and Viengthong). Again it must be noted that this level of intensification compares well with the economic model for the NRSLLDP, which in the case of pigs was estimated at 13% of households with pigs. The indication is then, that once forages and models for intensification have been introduced to an area, this level of adoption can be achieved within two years.

While the extension activities initially concentrated on the small focus group of farmers who had already established forages, other farmers quickly followed their example. Working within groups facilitated the uptake by farmers, even by those still establishing forages in their first year.

Intensified systems for ruminants, mainly based on fattening, were slower to emerge than for pigs. It is easy to attribute this to the greater cost of cattle versus pigs, however, as the project works with farmers who already raise either type of animal, this investment barrier does not apply. The returns and short time in which they can be gained in both systems are attractive (about 0.5 million Kip within one to two months, which is arguably greater for cattle and buffalo than for pigs), however, the degree of systems change required is greater for cattle and buffalo than for pigs. The challenge for ruminants is that a more substantial systems change must be achieved (moving from free-grazing of animals in the hills, to hand-feeding in stalls) than is required for pigs (simply adding stylo to an existing diet on an increasing basis). Thus, it is easier for farmers to adopt improved technologies for fattening pigs than cattle.

It must also be recognised that fattening of ruminants is a special case. Farmers are 'fattening' underweight animals, and gain a 'rebound' in weight gain when good quality feed is provided. This effect will be gained for just a few months and following this period, further weight gain will be slower. It is a system that will disappear once such undernourished cattle are no longer available in an area. Nonetheless it is a legitimate opportunity and can be used to encourage farmers to better management of ruminants.

5.1.5.3 Emerging impact in productivity and livelihoods

The numerical data collected has illustrated the adoption of forages and systems changes within the target villages. Indicators of impact on animal productivity and livelihoods are far more difficult to assess and are generally beyond the resources of a small project such as CBSLSP, however, some indicative data has been collected by staff and written up as case studies as part of their capacity building program. Two cases are paraphrased here, which illustrate the pathway that farmers followed towards gaining significant household benefits.

1# Mr. Bounxay (Hmong), Namneun village, Vienthong district

The family has little paddy. Maize is also produced but has little likelihood of making significant contribution to household income due to effects of alternatively floods and droughts.

Previous Livestock production issues.

The family owned 5 cattle, 11 buffalo and 3 pigs which were all raised free-range. Problems with cattle raising were:

- *animals lost as prey to wild animals.*
- *In dry season lack of feed caused animals to be thin, and even die*
- *buffalo with young calf, produced little milk, resulting in weak calves, slow growth and some mortality*

Health : de-worming was carried out (In some villages, vaccination was performed, although was not counted as it was provided by staff and thus not indicative of farmers adoption)

It normally took 4-5 years before animals could be sold, and prices were low due to poor condition.

Impact of forages

Initial trials with a small plot of 400 m² showed improved condition within 3 weeks (shorter hair and less curly, fatter).

- *first attempt at fattening (one animal drawn from the herd), gained a 0.3 million Kip price increase after 25 days.*
- *second round gained an additional 0.5 M Kip after 2 months.*

Aims

To expand to fatten 2 to 3 cattle together. Will expand forages to 1000 m². He envisages fattening could be the principal income for his family.

2# Mr Sivone (Khmu), Donexay village, Phonexay district.

The family is totally dependent on upland rice and other crops, (maize, sesame). The family owns 5 buffalo, and 8 pigs.

Previous pig raising

The main diet for the pigs was bran supplement with greens and taro. Bran was expensive, and the family spent 4 hrs to collect green feed each day. Due to these factors, the feed provided was usually insufficient, resulting in low growth rate. Typically they could fatten just 3 pigs each 2 years.

Effect of Stylo

In 2006 the family grew 400m² of stylo.

- *penned their pigs*
- *added stylo to the diet (1 bowl of stylo to 3 of bran and 4 of cassava).*

Increased number of pigs fattened to 7 in 2006 and 7 again in 2007. Gained better prices.

Plans

Will increase forage area by a further 500 m². This will enable him to focus on fattening and he hopes he will be able to stop all shifting cultivation.

Overall, the cases indicate that there is a range of benefits that can be gained through forages and then intensification of livestock production, which have become apparent within just 2 seasons:

- *reduction of time for collection of feed from 4 hours to 20 minutes each day. This has enabled farmers to devote time to other activities.*
- *costs of feed reduced, i.e. bran for pigs reduced by about 30%, due to the more efficient use of feed when stylo has been added.*
- *Reduction in time for fattening (higher daily liveweight gain).*
 - *for pigs, from 18 months to 9 months*
 - *for cattle, fattening periods of as little as 1 month gained profits of 0.5 million Kip*
- *higher prices gained, due to greater weight and better condition of the animals*
- *increased number of animals farmers produced (due to less time to feed).*
 - *for pigs, this was a change from 1-2 per year to 5-7 per year.*
 - *for cattle, farmers aimed to fatten 2 at a time*

These changes in productivity also show promise for livelihood impacts. Increases in income from these are in the order of 2 or 3 times what farmers previously gained from livestock production. This will certainly impact on family economies. As indicated by the cases above, this may eventually affect land use practices. Many farmers indicated they could imagine that if they can increase their area of forage and the number of animals they fatten, then livestock production could become the mainstay for their family. Some farmers have also reduced their shifting cultivation

and indicated that they hoped they could end this completely. Such changes have already occurred to a significant degree in old FLSP sites.

5.2 Mentor Districts

The main function of the mentor staff was to provide support in the capacity building of the trainee staff to work with NRSLLDP. At the same time, the FLSP model had focused on establishment of forages, and had achieved managed livestock (level 2 intensification) or enhanced production (level 3 intensification) with just a few specific farmers. Thus with their own field work, mentor staff were to attempt to develop models for managed livestock and enhanced systems.

Mentor Field Activities

During the first Mentor Workshop (February 2006) staff classified the old FLSP villages into three categories in order to focus efforts during the CBSLSP:

- (i) Significant use of forages, and thus ready for establishment of integrated systems (32 villages / 5 districts);
Extension supported to develop models of intensive production, using integrated interventions
- (ii) Forages introduced, and potential for more significant use;
Extension supported to demonstrate processes of introduction of planted forages and their use for trainee staff (47 villages / 5 districts).
- (iii) Inactive, slow response.
No CBSLSP activity

(See Annex 2, Table 3.4a for the detailed list and 3.4b for district maps).

5.2.1 Identifying interventions for integrated livestock production

Integrated livestock production systems include components of: improved feed, animal health, management, and breeding activities. The components suitable for each site vary according to local conditions. There is a hierarchy for the adoption of these components. To introduce interventions before lower levels have been achieved is premature and self-defeating. For instance to introduce improved breeds of cattle (which usually require better feed) is premature if animal are still grazing free-range on poor native grasses. This was described in "Livestock Systems Survey and Technical Options (PPTA Final Report, Appendix 4) and illustrated in the Table below extracted from that report (Table 5.2).

The four main livestock systems targeted for improved production are as follows:

1. Fattening of pigs in pens
2. Sow – piglet production
3. Fattening / finishing cattle (buffalo) for sale
4. Improved cow-calf production (cattle, buffalo)

While villagers also raise other animals (horses, goats, fish, and poultry) these were not targeted directly.

Table 5.2 Sequence of Potential Interventions for Large Ruminants
(Reproduced from PPTA Final Report Appendix 4)

Intervention ¹		Technology and Target Group		Objective
		Females	Males	
Improved Feeding	↓	Planting of forages		Improve dry season survival, increase growth of calves and fertility of cows and bulls.
Disease Control	↓	Vaccination against HS and de worming of calves		Increase survival from epidemics and growth of young cattle.
Breeder Management	↓	Heifer group management Heifer feeding Weaning Body condition scoring Girth measurement	Cull defective bull calves Bull exchanges Castration Girth measurement	Increase efficiency of existing stock and management through management of feeding, simply husbandry and farmer-measured growth and condition.
Mating Management	↓	Night herding and bull effect Spike feeding Oestrus detection	Bull segregation Timing of mating	Modify timing of reproduction and make positive breeding decisions through simple husbandry and management of stock in different classes.
Genetic Selection	↓	Selection of fertile cows Introduce new females Performance recording	Cull infertile bulls Introduce new bulls Performance recording	Initiate genetic change to take full advantage of better management and increase off-take.
Cross Breeding	↓	Introduce new breed of female	Introduce new breed of male	Accelerate genetic change in response to consumer demand or further lift herd efficiency through heterosis.
Artificial Breeding	↓	Embryo transfer	Artificial insemination	Only appropriate for highly productive systems where the benefits of all the above interventions have been fully realized.

(1) Options at the top of the table need to be implemented first because the lower options are dependent on them to be effective. Improved feeding, disease control and some aspects of breeder management are realistic expectations within the life of the Project.

5.2.2 Assessment of Options for Village Poultry

Due to the inclusion of village poultry in the NRSLLDP, the ADB and DLF requested that CBSLSP assess models for poultry that could be piloted in CBSLSP and then used in the NRSLLDP. The survey was conducted in three districts of Luang Prabang, and included traditional systems and three projects: World Vision, Lao EU Strengthening of Livestock Services and Extension Activities Project (SLSEAP), and the Lao Extension for Agriculture Project (LEAP).

Village poultry production is based almost exclusively on a free range semi-scavenging 'low input-low output' production system, with small amounts of supplementary feed provided by farmers in the morning and evening. There is little provision of clean drinking water. Housing is provided for the birds, albeit rudimentary and with poor sanitation. Hens produce 2-3 clutches of eggs per year, laying 10-15 eggs per clutch. Hatchability ranges from 50 to 90% and varies with the season. Chick mortality is a problem with most hens rearing only around 4-6 chicks beyond

two months of age. The most striking observation in relation to village poultry production is the high mortality. Mortality rates may be as high as 80 - 90% due most probably to Newcastle Disease and Fowl Cholera.

Project interventions varied. Two projects provided an improved breed of chicken but these failed badly. Also, they focused the training on men when in fact it is women who manage the birds. The most appropriate program, by LEAP, did succeed in generating champion farmers who began raising the chickens on a semi-commercial basis and could gain a significant income, however, even where this was achieved, other households in the village reverted to their old practices. This illustrates some critical issues facing improved poultry raising at the village level in Lao PDR. While various improvements can be made, unless effective vaccination can be provided the flock can be wiped out. Confining the flock to prevent transfer of disease means that scavenging no longer provides feed and farmers have to provide all of the feed. Thus there is no extensive improved system, only fully managed systems that are then semi-commercial and thus no longer generally accessible, and certainly not to the poorer households.

Thus at present it is still a struggle to identify a robust improved system for village poultry that will be generally applicable. The key to this being possible is the control of disease; once this is achieved then a range of interventions become possible (full report, Annex 3.5).

5.2.3 Field Activities

The Field Review (February 13-18, 2006) assessed the local issues for field activities in the target districts and recommended the key interventions. (Annex 3, Table 3.6). These were later reconstructed into the three stages of the livestock development pathway (Figures 3.1 and 3.2), however, initially, the mentor staff identified quite general objectives for their field work (e.g. "improved feeding"), which lacked clear entry points.

To resolve this issue, a new approach was developed for 2007. This selected specific interventions and construct Village Learning Activities. These took a specific element of the more intensive models (e.g., 'de-worming of pigs'), and provided staff with (a) a process for engaging farmers in a simple observation trial in the village; (b) the key elements of the trial; (c) points of observation; (d) alternative outcomes from the trial that could be discussed with farmers. This allowed staff to institute and evaluate specific interventions, rather than just promoting an improved system.

To provide farmers with incentives to intensify their production, development of greater market awareness was attempted. This was based on using agro-enterprise approaches that had been piloted by the SADU¹⁵ project. It was not the objective for staff to carry out full agro-enterprise development activities, but to use the tool of conducting Participatory Market Chain Surveys (PMCS). Conducting PMCS with farmers makes farmers aware of (i) the actors along the market chain and their function; (ii) seasonal variations in supply and demand; and (iii) trends, and preferred buying conditions of traders. Understanding these can indicate to farmers the market demand. Knowing this can lead them to seek improved

¹⁵ Smallscale Agro-enterprise Development for the Uplands project, implemented by CIAT in Xieng Khouang and Luang Prabang.

technologies to meet the market demand. The farmers may not respond to the same technology/ies if simply 'promoted' by DAFEO staff.

Following the 3rd Mentor Workshop, staff returned to their areas and conducted market chain surveys, however, they had not completely understood the objective of sensitizing farmers to market conditions. This activity was reviewed in August and it was re-implemented, this time involving farmers in the PMCS. This was more successful, but was rather late in the year to have an impact on farmers' practices.

Both the VLA and PMCS were used in 2007 by staff, with varying degree of effectiveness. Both of these new mechanisms need to be refined by the NRSLLDP.

5.2.4 Results: 2006 and 2007

Changes in production systems have tended to be in Luang Prabang for pig fattening and piglet production, and in Xieng Khouang, for cattle breeding and fattening.

5.4.2.1 Pigs in Luang Prabang

By late 2006, a range of improved management practices for pig fattening (level 2 intensification) had begun to be applied. In some cases, these occurred in almost all of the selected villages in Luang Prabang, but with just a few households participating. These were:

Management changes:

- Improved housing for pigs (raised floors, clean eating /rest areas, shade), and *ad libitum* water supply have begun to be applied in almost all of the 32 villages, with some villages now keeping all pigs in pens.
- A few villages have begun to castrate their pigs, and there are examples of selective breeding, including fattening of cross-breeds.

Animal Health changes

- Vaccination for CSF and de-worming are generally applied in almost all of the 32 villages.
- In all Pak Ou target villages, this is supported by Animal Health Revolving Funds.

SMART feeding changes

- Formulated feed rations, (maize and cassava) have been applied in a few villages, mainly in Xieng Ngeun district.

The detailed data for each village is available in Annex 3, Table 3.7a. This table is information dense, and to indicate the pattern of occurrence, key management and health changes have been highlighted.

In 2007, a very significant number of households had improved their pig production to apply the core interventions for enhanced production (level 3 intensification) for pig fattening. This included well constructed pens, *ad libitum* water, vaccination and often supplementary feed. Figures are not comprehensive, although indicative levels of change can be gained. For a cluster of 10 villages in Luang Prabang district, and another cluster of four villages in Xieng Ngeun, about 20% of households with pigs have intensified their production to level 3. Common benefits now being gained are: households are able to increase the number of pigs raised in each fattening batch,

and disease rates have dropped dramatically. (Annex 3, Table 3.7b)

Furthermore, in the villages where pig fattening has become widespread, several have begun to produce piglets at level 3 intensification. This becomes possible once there is a high demand of fattening and they now supply piglets for other farmers to fatten. In these areas, both fattening and production of pigs are now becoming a major economic activity for the village. Hat Nya village for instance sold 336 piglets for 100 M Kip in 2007.

5.2.4.2 Ruminants in Xieng Khouang

For Xieng Khouang the emphasis has been more on ruminants. Farmers are making the transition from use of forages for labor reduction, to using forages for fattening. Farmers have now begun to stall their animal and feed them 3 times per day, for 2-3 months.

The emergence of this new system is most evident in Nong Het where the Hmong farmers have a tradition of stalling cattle in preparation for bull-fighting. It is an easy transition from this system to stall-feeding. Data collected in 2006 shows there was a dramatic increase in the number of farmers planting forages to 600 households, of which two-thirds are fattening, (Figure 5.3.). The increase in area of forages planted is also notable, from 0.1 ha/HH in 2005, to 0.36 ha/HH in 2006. This reflects the higher rate of feeding for fattening, to about 40 kg/day per head (i.e. 3 servings per day). To confirm these figures, a spot survey of 11 farmers was made in both old FLSP and new or 'spontaneous' villages. On average, these farmers had forage areas of 0.6 ha (range 0.2 to 1.2 ha) and fattened 1 – 3 head per year, gaining an income of 0.6 - 0.8 million Kip/head from a fattening period of 2-3 months.

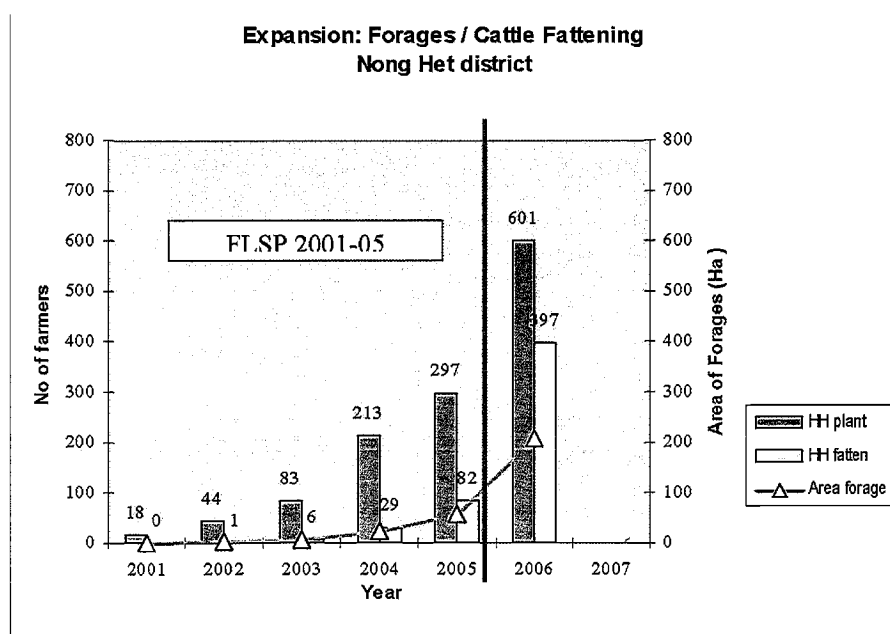
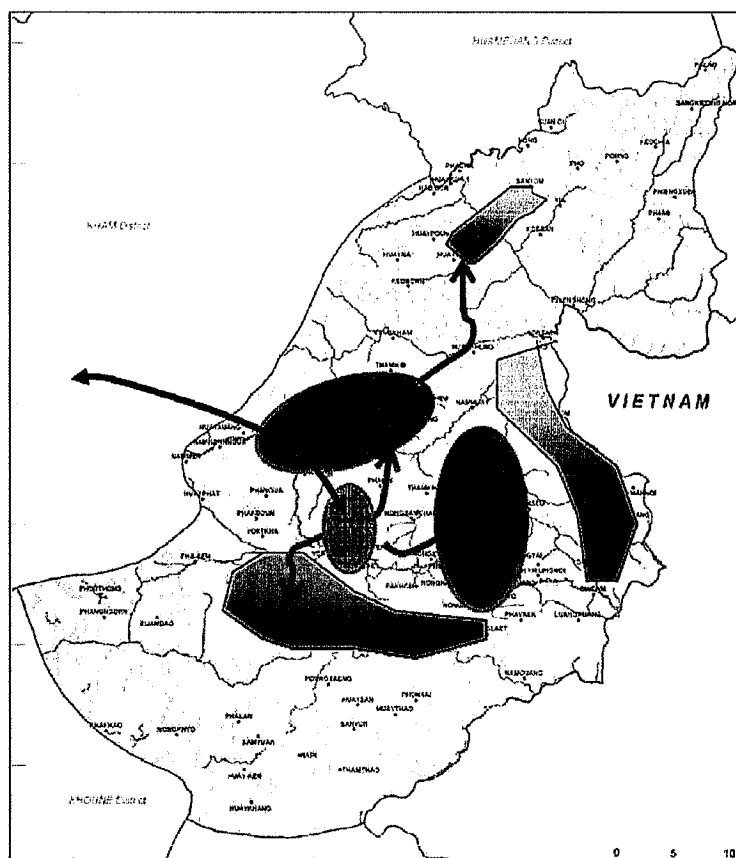


Figure 5.3 Expansion of forages (50 villages, Nong Het, Xieng Khouang).

This shift to fattening has been farmer-led, but is already providing a model for farmers just beginning to grow forages. Of the nearly 400 farmers who are now fattening, about 100 are 'first year' farmers who have moved directly into fattening (Figure 5.3). In other words, new farmers no longer work through a period of occasional use of forage when they had to collect feed from the wild. These new 'fattening' farmers are immediately establishing larger plots (1000-2000 m²) and proceed to fatten and sell cattle.

The dynamics of this transition to fattening are worth considering. The initial introduction of forages was intended to resolve demand on time and labor for collecting feed when animals had to be confined. When fattening developed in Ban Xang (Paek district) staff arranged a cross visit. They returned and a few of the farmers began to fatten cattle. As the benefits of fattening became evident, the use of forages began to spread spontaneously, farmer-to-farmer, along with exchange of planting materials (Figure 5.4). By 2006, forages had spread to an additional 26 villages, so that now 50 of the 120 villages in the district are growing forages on a total of 200 ha.



Note

Original introduction.
 Dynamic expansion
 Expand from models in district

Figure 5.4 Expansion of forages/fattening, Nong Het, 2001-2006.

Considering the original 24 FLSP villages, there are now 395 households (or

32%), growing forages, and 257 household (or 21%) are fattening. These rates are far higher than the 8.4% for cattle fattening used in the financial model of the NRSLLDP. The NRSLLDP rate applies across the whole project area, for which cattle and buffalo ownership are 32 and 43% respectively, whereas in Xieng Khouang ownership of large ruminants is almost double this rate. The rapid increase of fattening in the last year (more than trebling) suggests that this could soon become a 'normal' system, used by most household who raise cattle.

The data collected later in 2007 shows that in Paek district the main focus has been on cattle breeding with a large number of households now managing (level 2 intensification) their cattle for breeding. In Nong Het the emphasis has been on fattening, with perhaps 50% or more of households now penning their cattle for fattening.

5.2.4.3 Market Awareness Development

The PMCS were conducted initially without the participation of farmers and thus gained staff an understanding of markets, but could not affect farmers' perceptions. This was addressed in August when the process was reviewed and staff re-applied the PMCS, this time with farmers. The effects of this were reported in the final workshop for mentors (November 2007). The time for substantial effects to have emerged was however too short.

Across the districts, staff reported some general effects:

- Farmers had previously sold only when they needed cash, and now appreciated the market demand and its variation through the year
- Farmers now understood the position of traders and the basis for low prices (due to season, poor condition etc.) in relation to market factors, and this provides them with some basis to bargaining

Farmers have begun to request technologies that would resolve constraints and allow them to capture market opportunities. These are summarized in Table 5.2.

Table 5.2 Demand for improved technologies due to 'market awareness'

District	Farmers response to greater market awareness after the PMCS
Paek	- would like to form groups, and sell on a planned basis - traders willing to pay extra 250,000 – 500,000 for a 'lot' of 10+ cattle - expect to see growing demand for services
Pak Ou	- appreciate the need for healthy stock therefore want animal health services - want to know feed rations for different stages of pig growth - sell pigs as group gain price increase 10,000 → 11,000 kip/kg
Xieng Ngeun	- See opportunity to sell at 13,000 kip/kg compared to the current 9,000 kip/kg - Would like to plan output to capture larger traders and seasonal prices - More confident to bargain as they know that the demand is not being met - What feed ration to reach the 45 – 80 kg weight as quickly as possible
Luang Prabang	- See need for healthy animals and need more animal health interventions - Want to time output to meet seasonal demand

Staff felt that the PMCS would be a tool that they should use before attempting to introduce more intensive ethnologies, even using VLA. These responses remained formative and unrealized within CBSLSP. Continued work on development of market awareness would be expected to sharpen farmers understanding of market requirements and heighten their demand for technologies to address them.

5.2.4.4 Final Comment on emerging impacts

The changes in production are becoming quite significant with levels of intensified production 2 and 3 being applied in some districts. Farmers in several sites have explained that if they can sell 3-4 head of cattle per year, then that will be sufficient to provide their basic needs. Similar comments were made for pig production. There are villages where pig fattening or piglet production is carried out by a large proportion of the village, and income from this production system becoming the mainstay of the family economy and there are indications that this may have contributed to a reduction in shifting cultivation. Reports of the reduction in shifting cultivation were a recurring feature in the project evaluation, however, these are largely anecdotal at this stage:

Luang Prabang district: Long Lanh and Bo Hae villages (50% reduction for the 2 case households)
Pak Ou district: Hat Kham villages (3 households have stopped shifting cult.)
Xieng Ngeun district: Sylalek village (case households reduced from 2 ha to 0.5 ha)
Nong Het district: Pha An village (case household stopped shifting cultivation) San Yom, Phaper, Phahok, Thapsus villages (general comments of reductions in shifting cultivation)

Not only can intensified livestock production supply income for upland households, it can also add to the family assets and capital value. Two farmers in Hat Kham village expressed how establishment of forages changed their perception of land value.

- One had begun fattening pigs 4 years ago, then progressed to raising goats and now owns 5 cattle. He estimated he had a little less than 1 ha of forages. This land if sold as typical upland fallow would fetch a price of less than 1 million Kip. When asked how much he would now sell, he replied he "wouldn't sell for 10 million Kip, perhaps for 15 million Kip".
- The second farmer had previously had sufficient labor to raise only 2 cattle. With forages he increased his herd to 7 cattle and 5 buffalo, as a result of having more than 1 ha of forages. He would not sell the land for 30-40 million Kip. This seemingly high price he justified by indicating that 3 of his cattle are already in calf.

This increase in land value due to planted forages is no different to other forms of land investment such as paddy field, teak plots etc. For poor farmers, forages are a very accessible way to recapitalize their land. This is a fundamental step for households to be able to invest further and to diversify into higher-value types of agricultural production.

5.3 Lessons learnt

5.3.1 Establishing managed livestock systems

For farmers to manage their livestock, they require access to adequate feed resources. The establishment of planted forages has provided this, and thus been used as the 'entry point' for managed livestock production. The establishment of forage plots by farmers in the 24 villages exceeded expectations, with almost the full quota of five households per village, and with only 10 failures. This continued in 2007. The appreciation of this intervention by farmers was evident in the expansion within the first 24 villages, and the rate of adoption by farmers in 2 new villages, which matched that of the first batch of villages.

It is also clear that the introduction of planted forages did indeed act as an 'entry point'. In the original 24 villages, one-third of the households who had already adopted forages for pig raising, intensified their pig raising further by penning and deworming their animals. Some intensification has occurred for cattle, but this is more limited to particular sites, mainly Khoun, but also Viengthong and Viengxay, where fattening has occurred.

The results summarized above have then established a firm base of improved livestock production in the 6 target districts. Further expansion should now be possible from this base.

The key lessons for establishment of improved livestock production that can be gained from the CBSLSP experience are summarized below:

5.3.1.1 Selection of sites and farmers

Village selection

The selection of villages was presented as a 'lesson' already, but is emphasized again here. If sites are selected that are not appropriate then it will not be possible to gain results. Guidelines are provided in Section 4.3.1

Role of forages

Introduction of planted forages is a novel activity and one that farmers will initially find strange. The factor that has been found to gain their interest was not the longer term opportunity of fatter animals and higher prices, but helping to solve their immediate problem of time and labor constraints to collect feed for those times of the year when animals are confined. Thus the early activities of PRA and PD should be used to identify those periods and suggest forages as a solution.

Once examples of forages have been established in a district then these can be used to illustrate to farmers the use of forages and subsequent intensification (see below)

Interpretation of PRA and PD

PRA and PD do allow farmers and staff to meet and gain some confidence in each other, however, staff need to use these tools more interpretatively to assess general conditions and specific issue as described above.

Selection of focus group farmers

Staff have tended to focus more on large ruminants, however, pigs are raised by most households and it was been found that use of forage for pig raising was initially three times that for large ruminants. Staff of NRSLLDP should be sure to give adequate attention to pig production. This will also mean that they should take special care that women are involved in initial activities and selected as part of the group of 5-6 focus group farmers.

5.3.1.2 Forage Nurseries

While these were established and did provide a timely source of cuttings of forages, it has proven to be too difficult to coordinate between the nursery and farmers to ensure that the forages are collected, transported, and transplanted to provide an early supply of forages for farmers. Despite this, the nurseries do serve other

worthwhile purposes in the first year in a new district. They provide a concrete activity for staff early in the year, and allow familiarization with forages before they are introduced to farmers. The nurseries themselves can also be used for an early cross-visit to focus group farmers so that they can be encouraged to maintain their own plots properly.

While their application should be used in the first year in a new district, their planting and maintenance should be contracted out to farmers, rather than managed directly by the DAFEO staff.

5.3.1.3 Introduction of Forages

Planting material was provided to farmers in quantities sufficient to allow them to use the forages and see some effect on their animals, but not to support farmers in all their needs. Thus, farmers who wished to continue use would have to expand using cuttings taken from their own plots. This was in fact observed in almost all sites. This ensured the opportunity for dynamic expansion from the outset, and did not create any dependency of farmers on planting material supplied by the project.

The inputs provided included six forage species in 2006 and then just five in 2007. This ensured farmers had the opportunity to see the performance of different types of forages. Farmers have not yet discriminated greatly between species. This will develop more once farmers rely more on forages. They will then be able to select from the material they have for the type that has the characteristics they need, based on suitability for different soils types, drought tolerance etc.

To further enable dynamic expansion, farmers should be encouraged to become suppliers of planting materials, both cuttings and seed. Such suppliers will actively encourage the use of forages to more farmers and at the same time provide instruction on their planting and use. To encourage this, the project will need to be careful it does not distribute large quantities of planting material, which would drive a flush of expansion, but not contribute to sustainable expansion. Processes to stimulate the emergence of farmers as suppliers of planting materials are being piloted by SADU in Xieng Khouang

5.3.1.3 Expansion of forages / improved livestock production

The expansion of new farmers in the Y2006 and Y2007 villages, was very significant. Mechanisms that were effective in achieving this are noted below.

Farmers with well established forage plots do not always proceed to using it as feed. Farmers are used to harvesting what they have planted as a crop, when it matures. Staff have a role to monitor progress, and encourage farmers to cut and use the forages as feed as soon as they can. This can be within 1 to 2 months after planting, depending on local conditions.

Staff used a number of extension activities to ensure sharing of information between farmers:

- collecting cases of improved animal condition and emerging impact, through dialogue with farmers. These were used in Village Exchange Meetings to show other farmers what could be gained from using forages. These cases of improved condition were more effective than staff explaining technical characteristics of the forages. This was particularly important in Year 1, when forages were still very new.
- Village Exchange Meetings were effective to spread results gained

from the Focus Group farmers (4-6) within the village, leading to further scaling up.

- Cross-visits between villages provided exchange from outside of the village. This ensured that villages which had not performed well had a chance to compare themselves with other villages.
- Formation of 'interest groups' within a village was useful to ensure experienced farmers supported new farmers who joined at the beginning of the second year.

5.3.2 Intensification of Livestock Production systems

Maintaining work in selected mentor villages was intended to not only support capacity building but also to provide models of integrated livestock development systems. This began to emerge in 2006, with elements of intensification observed across many sites, but with only isolated farmers in each sites.

In 2007, this was consolidated with significant numbers of farmers in many villages both fattening and producing piglets at level 3 intensification. These could now be considered to provide a model for both levels 2 and 3 intensification for pigs. Intensification has occurred for fattening of ruminants, mainly in Xieng Khouang.

It is important to note that it cannot be assumed that because farmers have begun to manage their livestock using forages that they will automatically continue to intensify their livestock production. Extension staff can still play a key role in enabling farmers to make the shift to higher levels of intensification.

5.3.2.1 Introduction of intensification

It was not sufficient for staff to simply promote a more intensive model of production. Such recommendations were too general. Specific elements of the improved models were re-formulated as Village Learning Activities. These provided staff with simple comparison trials they could mobilize in a village with interested farmers. Thus VLA provided a concrete activity to drive learning and adoption. There was a degree of variability in the way these activities were implemented and thus the mechanisms should continue to be refined by NRSLLDP.

5.3.2.2 New models used to accelerate intensification

As new models become established, it is possible for new farmers to see these as the 'norm'. They will be willing to make a direct systems change, rather than the progressive change currently used to introduce forages in new districts for time/labor saving. This jump to new systems has become evident in Nong Het, where most new farmers move directly into fattening, and in the new districts such as Vieng Phoukha where many new farmers are willing to pen their pigs based on using stylo as a supplement.

Thus the establishment of new models of higher intensification can help to accelerate changes in production, and thus for farmers to gain greater benefits and more quickly.

5.3.2.3 Market awareness to provide an incentive for intensification

Farmers will not simply adopt intensification to simply be 'better' pig or cattle producers. They must have an incentive. Involvement in the conduct of Participatory Market Chain Surveys did help to provide farmers with a better understanding of market requirements. This provided them with specific objectives to achieve in terms of volume and quality, motivating them to seek more intensive technologies to achieve these. Thus the application of PMCS could be used to stimulate the interest of farmers to intensify production to higher levels.

This process was again applied variously by staff of different DAFEO. Further refinement of this should be continued by NRSLLDP

5.3.2.4 Services needed for intensification

Some aspects of intensified livestock production require access to material for services. In the absence of services in many areas it is difficult for farmers to apply the necessary health interventions for higher levels of intensification. Availability of breeding services also limits farmers in the quality of animals they have for mating and then fattening.

The emergence of such services can be supported strategically by NRSLLDP once a site has gained a critical mass of interested farmers and thus sufficient demand. This is evident in Luang Prabang district where farmers have moved into piglet production to sell to farmers who wish to fatten animals. Models for the development of service providers are being piloted by CIAT in the SADU project.

5.3.2.5 Establishing trading links

Intensive production of livestock has begun with both pigs and ruminants, however, farmers are still selling on an *ad hoc* basis. As such, it is possible for farmers to regard their current benefits as a transient windfall and to let it disappear if some other factor intervenes.

It should be possible to establish mutually advantageous links between producer villages and traders, such that farmers supply traders with requested numbers of animals on a regular basis with consistent high grade, and for farmers to gain preferential prices in return. This should help in ensuring that livestock production becomes one of their core economic activities, rather being seen as a windfall. The SADU project implemented by CIAT is piloting mechanisms to facilitate establishment of such trading linkages.

6. CAPACITY BUILDING

Capacity building of the project was aimed at two groups, (a) technical extension staff and (b) administrators at provincial and national level.

For the technical extension staff, the skills needed to be fully functional in conducting effective extension for livestock production include the ability to perform the following tasks:

- (a) To identify the existing constraints in livestock production experienced by farmers and thus the suitable entry points
- (b) To help farmers establish forage blocks and use the forages effectively to feed animals, as the first step to towards improved management of their livestock
- (c) To understand basic animal health problems and ways that these can be addressed
- (d) To be able to identify pragmatic improvements in livestock management, and ways that these can be introduced to farmers
- (e) To understand how to assist farmers to assess market requirements and how farmers can improve their production to take advantage of these opportunities.

Within just two years it was not possible for CBSLSP to achieve these skill levels fully, however, the capacity level of the staff at the end of the project is more than adequate to match the production levels to be achieved by the NRSLLDP, and it must be remembered that the skills of the technical extension staff will continue to increase. The levels of intensified livestock production will be achieved progressively. The first step for farmers to move towards commercial livestock production is establishment of planted forage as a feed resource, which then leads to them managing their livestock better and selling on a regular basis. This shift will already generate significant benefits, which is the basis for the financial model of the NRSLLDP. It is then possible that many farmers will continue to develop their livestock production so that it becomes a core part of their household economy. This will involve more intensive systems where supplementary feed is provided and breeding is managed. These 3 levels of intensification with the knowledge and skills required by DAFEO staff, are presented in Table 6.1.

The main focus of capacity building for CBSLSP has been the 24 technical officers of the 6 DAFEO in the first cohort of target districts for NRSLLDP. These are amongst the poorest districts in the country and staff have had little exposure to projects and other learning opportunities. As a result their technical knowledge and extension skills were quite low. As the NRSLLDP aims to develop livestock production to Level 2 intensification, the trainee DAFEO staff must gain the capacity to work with farmers at this level.

Training is also provided to the mentor staff who need to adapt to their new role as mentors, as well as to develop the models for more intensive livestock production such as those listed as levels 2 and 3 of intensification.

The project also aimed at building the capacity of provincial coordinators and national staff within DLF. These staff need to have an understanding of the processes the technical officers will use in the field, they need to guide and support these staff, and to plan and manage extension activities. Such skills are now evident at both provincial and national levels.

Table 6.1 Outline of tasks require for extension according to the level of intensification and the related knowledge and skills required.

	Intensification Step 1 'Entry Point'	Intensification - Step 2 'Basic Management'	Intensification - Step 3 'Enhance Production'
Tasks	<ul style="list-style-type: none"> - Identify key issues affecting livestock production in villages - Engage 'focus group' to plant forages - Establish farmers' forage plots - Introduce the use of forage as feed - Identify changes in livestock condition - Assist 'focus group' to disseminate results within village 	<ul style="list-style-type: none"> - Conduct village planning meeting - Expand planting and use of forages within villages - Introduce more intensive interventions within the villages - Initiate improved livestock production to additional villages - Farmer to farmer learning through interest groups and cross visits. 	<ul style="list-style-type: none"> - Conduct village planning - Develop farmers' awareness of market requirements for livestock - Support intensification of livestock production to enhanced levels - Use of 'village learning activities' to introduce technologies.
Capacity Building input required	<p>Understand</p> <ul style="list-style-type: none"> • role of forages as 'entry point' for livestock intensification • general extension dynamics • basic animal health issues <p>Skills to conduct</p> <ul style="list-style-type: none"> • PRA and PD • Facilitate village meetings • Points of observation of livestock condition • Focus group discussions • Village Exchange Meetings 	<p>Understand</p> <ul style="list-style-type: none"> • Role of more intensive interventions (penning, feeding trough, de-worming) • Dynamics of expansion from small focus group • Role of farmer groups <p>Skills to conduct</p> <ul style="list-style-type: none"> • engage focus group in range of more intensive interventions • form interest groups and small groups for peer support • conduct cross-visits • write of case studies and prepare posters 	<p>Understand</p> <ul style="list-style-type: none"> • Role of market awareness to encourage farmers to intensify production • Role of more intensive technologies <p>Skills to conduct:</p> <ul style="list-style-type: none"> • PMCS • Village Learning Activities for SMART feeding; animal health; selective breeding; creep feed for piglets and spike feeding for cow; • facilitation of village arrangements for manure management and village quarantine

6.1 Trainee Staff Capacity Development

6.1.1. Expected Outputs

The crucial skill-set required by staff for most of NRSLLDP work will be (a), (b) and (c) above. By the end of CBSLSP they should be able to identify constraints to village livestock production, establish forage plots and encourage their use for feeding, and understand animal health issues and the likely responses.

In addition to these technical areas, the trainee staff will need to have skills in problem solving, planning and reporting, and a professional commitment to their work. This last is somewhat indefinable, but it is what ensures an extension worker is actively assessing the progress of activities and what needs to be done to engage effectively with farmers.

The trainee staff need to carry out tasks to assist farmers to achieve Level 2 intensification. This involves the following key tasks:

6.1.2 Capacity Building Inputs for Trainee staff

The key challenge for training staff in the new districts is not so much technical competence, but rather to develop a professional commitment to their work. This is particularly challenging as following any training session, staff return to their own districts where they must operate within the existing work culture.

Staff are trained in-service and so are able to apply directly what they learn in workshops. The results they gain in the field then reinforce what they have learnt. It is from this field work that they 'learn' the extension methods.

Particular attention was given to the structure and scale of the field work. The four staff in each district operated in teams of two, to support each other, and to balance abilities. The number of villages they working is limited to enable learning without imposing an unnecessary work load. In Year 1, each team worked in 2 villages, so that they could learn from their application in the first village and make adjustments in the second village. In Year 2, the main focus is expanding the number of farmers in the villages and intensifying the livestock production systems. In addition to work in the old villages, they initiate work in two new villages. This allows them to replicate their work from the first year, while not creating a focus that will distract them from the new extension challenges of expansion and intensification in the old villages.

Training is iterative with the training inputs designed to match the tasks required at each stage of the work in the field. The capacity building inputs are comprised of three elements:

6.1.2.1 Technical workshops

These provide the technical knowledge required in relation to on-going field work, and outline the extension activities to be carried out. Workshops were structured as follows:

- reporting of field activities, to identify issues and ensure staff were aware of

- lessons gained from the experience
- new technical and extension inputs
- planning of on-going field activities

Emphasis was given to staff participation, to ensure they continued to assess the strong and weak points of their work, and identified ways to improve their work.

Two workshops were held each year. The objectives and content of each workshop are listed in Table 6.2. Details of the program and participants for each workshop are provided in Annex 4, Tables 4.2 - 4.5.

Table 6.2 Workshop inputs for trainee staff.

Input	Date	Location	No. Participants / Trainees	Key Objectives
Training Workshop T1	March 10-18, 2006	Luang Prabang	49 / 23 (including 6 partner project staff)	<ul style="list-style-type: none"> - Introduction to the project - Introduction of general strategies: <ul style="list-style-type: none"> - extension processes - livestock development pathways - Specific skills: <ul style="list-style-type: none"> - PRA and PD - Establishment of forages
Training Workshop T2	October 24 – 28, 2006	Xieng Khouang	36 / 24	<ul style="list-style-type: none"> - Review lesson of forage establishment - basic animal health
Training Workshop T3	February 22-26, 2007	Luang Prabang	37 / 23	<ul style="list-style-type: none"> - intensification and systems change - working with farmer groups - cross visits
Training Workshop T3	October 18-21, 2007	Luang Prabang	38 / 23	<ul style="list-style-type: none"> - review system change - preset case studies - development of extension materials (posters) - planning for on-going expansion - linking to NRSLLDP

6.1.2.2 Mentoring

Mentoring was aimed at both reinforcing the technical learning and demonstrating the extension processes (e.g. how to conduct PRA, PD, Village Exchange Meeting etc.). Also, provided an example for extension workers who were confident in their work and gaining results, and thus served to inspire a professional commitment with the trainee staff.

Mentoring was provided in two ways:

- Trainees to Mentors:** trainee staff traveled to mentor districts (i.e. 'old' FLSP districts) to work alongside mentor staff as they continued on-going extension activities. Here they could observe farmers already gaining an impact, as well as experienced staff in operation and their interaction with farmers. In these cases all trainees traveled and were matched with a mentor staff
- Mentors to Trainees:** Mentors travel to trainee district, at critical times to assist in initial implementation of key activities and check on trainee staff performance.

In this case only those mentors who were technically best and who had good communication skills were selected to travel to the districts of the trainees.

Each of these was carried out on two occasions in 2006. In 2007 it was no longer necessary to impress upon the staff to work with professional commitment as it was clear this had already developed. Only one mentoring event was carried out in 2007 in which the mentors went to the trainee districts to assist with PRA and PD, an important and complex event¹⁶. A list of the mentoring activities and their objectives is summarized in Table 6.3.

Table 6.3 Mentoring inputs for trainee staff.

Input	Date	Location	No Participants / Trainees	Key Objectives
Mentors to trainees	28 March to 3 April, 2006	New Districts	25 mentors 24 trainees	– Support for PRA and PD – Establish forage nurseries
Trainees to mentors	Between 10 and 21 June, 2006	Old Districts	25 mentors 24 trainees	– Consolidate establishment of farmers' forage plots by seed (common errors) – Develop cases of forage use and impact – Process of introduction to farmers
Mentors to trainees	Between 15 and 24 August, 2006	New Districts	6 mentors 24 trainees	– Review establishment of forages and subsequent management – Identify opportunities for farmers to use improved management
Mentors to trainees	Between 5 and 26 December, 2006	New Districts	6 mentors	– Process: focus group meetings. – Process: village feed-back meetings.
Mentors to trainees	February 2007	New Districts	6 mentors	– Review and support application of PRA, PD

While the mentoring was discontinued after the PD in 2007, this does not diminish its value. In comparison to FLSP staff, who did not have examples to follow, the 24 trainees in CBSLSP had no delay in recognizing that introducing forages to farmers could have an impact and does lead to improved management of livestock. Thus there was no hesitation in their presentation to farmers. For key extension activities such as PRA, PD, Village Exchange Meetings, etc., the trainee staff themselves claim that they would not have been able to perform these without the guidance of the mentoring staff. Thus the mentoring was an essential element in the first year of capacity building, without which the benefits of the training workshops would not be realized.

6.1.2.3 Monthly Networking Meetings

Extension activities can never be over prescribed and staff must constantly adjust activities to suit the circumstances. Staff must develop a proactive 'problem-solving' attitude in their work, rather than one of passive 'following orders'. This is the case for day-to-day arrangement of extension, such as arranging village meetings (which is not

¹⁶ One additional new extension event for 2007 that required mentoring support was on conducting cross-visits, however, support for this was provided by the AIR Project rather than directly by CBSLSP.

always easy!), as well as for identifying the new stages of development with farmers in successive years, and then planning the necessary extension activities to achieve these developments. The monthly meetings provided opportunities to share experiences and thus a non-threatening forum to question and learn.

Meetings were attended by staff from all districts within a province and headed by the Provincial Coordinator who facilitated the process. The meeting was structured in three parts; (a) reporting of activities in the past period; (b) general discussion and issues; (c) planning of activities in the coming period. The meetings were also used for regular management activities such as disbursement of per diems etc., which provided a good draw-card for the meetings.

Meetings were not held every month due to other activities or the lack of a need for a meeting; on average meetings were held on seven occasions in both years. Ideally they should have some mentor staff who can guide the trainee staff. In this regard the exchange in different province varied. Trainees in Luang Prabang and Xieng Khouang provinces (Phonexay and Khoum Districts) benefited as staff from mentor districts also participated. In Houaphanh, the two trainee districts Viengthong and Viengxay were able to exchange experiences, although without any mentors to provide additional inputs. Neither Pha Oudom nor Vieng Phoukha districts had companion districts with which to interact. This resulted in a lack of stimulation and showed in their performance at the end of the first seasons. The risk of this was recognized at the beginning of the project and an attempt was made to encourage the involvement of NGOs working in these districts to follow the activities themselves and thus participate in monthly meetings, however this was not possible. In 2007, opportunities for peer exchange were generated by holding monthly meetings attended by both districts at a common point, first in Houayxay and then in Vieng Phoukha.

The monthly meetings supported the staff in a number of ways:

- technical details of forages and livestock production systems
- methods of working
- logistical support (staff from Luang Prabang district lent motorcycles to Phonexay staff before the CBSLSP motorcycles were delivered).

The value of the meetings depended very much on the facilitation of the Provincial coordinators. A sample of issues raised during the Monthly Networking Meetings is shown in Annex 4, Table 4.6.

6.1.3 Results for Trainees (2006 and 2007)

No baseline study was carried out at the beginning of the project, but staff capacity was quite low. Staff had no knowledge of forages; how to plant and manage them, their use as feed, or their use as an entry point for further intensification of livestock production. Staff said that in terms of working with farmers they were afraid of village meetings, that they did not know how to present new ideas to farmers in ways that they would understand and engage them, or how to handle farmers' comments and queries publicly. The results of capacity building and their growth in confidence in these areas can be seen in the results gained in the field.

In the first year, 2006, the staff succeeded in engaging five farmers in almost all villages to begin using forages. While mentors did assist in the first two villages in each district, the trainee staff achieved similar results on their own in the other 2 villages.

Forage plots were reasonably well established, with significant use gained in almost all villages. In four of the six districts some instances of impact began to emerge. The two weak districts, Pha Oudom and Vieng Phoukha, recovered their performance following the training workshop where their results were reviewed along with their peers. Vieng Phoukha went onto become one of the better districts, however, Pha Odom did not progressed beyond the introduction of forages. With numerous changes in staff, it remains a district at risk.

At the end of 2006, staff were able to engage the interest of additional farmers in each village through the Village Exchange Meetings. This was realized in 2007 with the number of farmers planting forages increasing from 112 to 556, a five-fold increase, something quite exceptional for a technology as novel as forages. Part of this expansion was due to staff shifting from working with individual farmers to working with 'interest groups' within villages. Thus they have begun to gain an understanding of the dynamics of expansion from a small group, and the role of exchange between farmers.

This expansion was gained not only within the first 24 villages, but also with the two new villages in each district. Thus staff have shown that they can replicate their work independently, confirming that they can engage farmers to be interested in growing forages and improving their livestock production.

Furthermore it is evident that with experience the staff have increased their ability. At least in terms of the establishment of farmer forage plots, the quality of these plots improved dramatically from the first year to 2007¹⁷. (Table 6.4)

Table 6.4 Effect of staff experience on forage plot establishment

Year	Type of farmers	Quality of farmer forage plots (%)		
		(-)	(+)	(++)
2006	New farmers in first 24 villages	20	48	32
2007	Additional farmers in the first 24 village	6	41	53
	New farmers in the two new villages	9	36	55

Note: (-) forage plots failed or were not adequate to supply forage for significant feeding
 (+) forage plots sufficient to supply material for significant feeding
 (++) forage plots well established and productive

For staff to perform to the needs of NRSLLDP, they must assist farmers achieve Level 2 Intensification. This includes penning, use of feed troughs, de-worming, and regular inclusion of forages in the diet. For pigs, staff have succeeded, with 15% of households now penning and 11% of households de-worming their pigs. This intensification has

¹⁷ These results were from self-assessment by staff as presented in the T4 workshop (November 2007). While certainly subjective, sites visits by PMU staff and TA generally confirm this assessments.

been achieved with ruminants at only about 2% of households (see Annex 3, Table 2.6b). These results indicate that staff have begun to work with systems change and not simply promotion of a technology. This is also evident in other ways: their aims are expressed in terms of outputs (e.g. improved fattening) rather than delivery of a technology; their inclusion of additional technologies (e.g. stylo leaf meal) when applicable; and their written case studies. Appreciation of a systems change is a quite important attribute for staff to have gained, as it makes them flexible in applying technologies as required to fit the context and the needs of farmers.

Staff also gained a high degree of professional commitment. By the end of 2006, staff displayed a willingness to contribute in workshops, and staff within each district supported each other in presentations. Thus it was possible to drop the mentoring activities for 2007, except when new events were introduced that were supported through EASLP¹⁸).

In the final workshop, in 2007, staff made excellent presentations of the work carried out and results achieved. They were articulate and were able to indicate strengths and weaknesses. When queried on particular points, they were able to provide detailed explanations. They were able to project future opportunities and give some idea of activities needed to achieve these. They had developed a capacity for critical thinking and they had begun to have some appreciation of extension dynamics and how farmers will respond to their activities. Thus they should be able to contribute to development of plans for expansion of activities within their district.

Overall, staff should be able to perform the tasks required for the NRSLLDP, which include engaging farmers, establishing forage areas, and assisting with basic intensification, including penning and de-worming .

This capacity was not developed evenly across all teams. Pha Udom suffered five staff changes, so at the end of CBSLSP only one of the staff who joined the project in March 2006 remained. It is doubtful that Pha Udom will be able to perform beyond the introduction of forages, without special support. In the other five districts, while not every staff is at a satisfactory level, 2 or 3 staff are, and thus within their teams, will form a satisfactory base for the district to continue to expand activities to other villages.

Beyond the capacity of the individual staff, the capacity of each DAFEO is still threatened due to the high number of contract staff. About 50% of the staff trained are contract staff, and not permanent GoL staff (see Annex 1, Table 1.3). They now have quite marketable skills and could easily be attracted away to work in other projects as they presently have no job security. This matter should be looked at urgently by NRSLLDP. Were possible they should be included within any quotas to be made permanent staff. With the training provided by CBSLSP it can be fairly sure they will be capable staff.

6.2 Mentor Staff

The main purpose of the involvement of mentor staff was to support the development

¹⁸ The "Extension approaches to scaling out livestock production in northern Lao PDR" is an ACIAR-funded project that used CBSLSP as its vehicle for action research, thus it was able to bring additional resources.

of the trainee staff for NRSLLDP. To do this they had to have an active platform in which to work themselves. Within FLSP they had not developed production models beyond Level 1 Intensification, through to Levels 2 and 3 Intensification. The main challenges for capacity building for the mentors were thus:

- (a) the shift from a forage focus to a focus on systems change
- (b) the greater technical knowledge required for levels 2 and 3 intensification
- (c) the capacity to facilitate farmers gain greater market awareness

6.2.1 Capacity Building input for Mentors

A series of training workshops were provided to mentors. These were similar in structure to those described for trainees (sect. 6.1.2.1). These are listed in Table 6.5, with details in Annex 4, Tables 4.7 – 4.10.

Table 6.5 Training Inputs provide to DAFEO staff – Mentors 2006

Input	Date	Location	Number of Participants / Trainees	Key Objectives
Workshop M1	21-24 February 2006	Luang Prabang	44 / 23	<ul style="list-style-type: none"> – Introduce project – Develop mentoring functions – Identify villages for integrated livestock production – Develop workplans
Workshop M2	27-30 September 2006	Xieng Khouang	32 / 23	<ul style="list-style-type: none"> – Nutritional requirements over life-cycle – Management opportunities – Common disease identification & treatment
Workshop M3	26-30 March 2007	Xieng Khouang	38 / 23	<ul style="list-style-type: none"> – Use of Village Learning Activities to introduce intensive technologies – Use of PMCS to develop market awareness
Workshop M4	5-8 November 2007	Luang Prabang	31 / 23	<ul style="list-style-type: none"> – Review of intensification models – Review of market awareness development

In addition, a series of mini-trainings were provided during the monthly networking meetings on specific elements of intensification (e.g. pen and trough design; feed formulation; quarantine procedures; body condition and weight assessment; creep feeding for pigs, etc). These were aimed at level 2 and 3 intensification ('basic management' and 'enhanced production'). The trainings were a combination of class room work and practical activities in the field provided only to the mentor districts. Despite this, as trainee staff participated in monthly meetings they also benefited indirectly from the training inputs. This additional training input for trainees was not particularly evident in terms of their outputs in the field, being rather beyond their current capacity.

6.2.2 Results

As indicated earlier, it was difficult for the mentor staff to shift from their focus on the introduction of forages to a greater focus on farmers. This did not change markedly throughout 2006, and began to emerge only later in 2007.

This was more clearly evident with staff in the Luang Prabang districts where the main

focus was with pig production. In each of the three Luang Prabang district there are now staff who take a comprehensive view of pig production and can work competently with issues for Level 3 Intensification, such as penning, feed formulation, weaning and creep feeding for piglet production, village quarantine systems, manure management and managed breeding within the village (castration of young males and selection of parents). As indicated in section 5.4.2.1, by the end of the project these interventions were beginning to be applied by significant numbers of farmers, with pig fattening and breeding becoming core parts of household economy in some villages. With this level of application, these can now be claimed to represent new models for levels 2 and 3 intensification. Once consolidated, it should be possible for these to be introduced to new farmers to apply directly, without the need to work through the transition phases of the simple use of forages to resolve time and labor constraints.

In Xieng Khouang work with ruminants was still mainly focused on feed and forages. Fattening of cattle and buffalo using hand-feeding of forages has become well established. This can now be used as a model for Level 2 Intensification that can be introduced directly to new farmers.

The application of PMCS was a new activity for mentor staff. Their initial application following training was poor - they suffered from not having mentors for a new activity! With additional support they were able to implement these activities reasonably well. This remains an area that is new for the staff, and it cannot be claimed that they have gained real competence.

In the area of mentoring there was significant variation between the staff in performing this role. About half of the mentor staff have gained sufficient competence to be able to guide new staff in technical areas and extension processes, but only half of this group have the attitude that makes them effective field 'trainers'.

6.3 Provincial and National staff.

Except for the two coordinators in Luang Prabang and Xieng Khouang, the other provincial and national staff had no familiarity with the use of forages as an entry point for livestock intensification. No specific training was provided for these staff, however, they participated in each of the workshops for trainees.

Two specific meetings were arranged for the provincial coordinators and national staff. These were aimed at focusing on their role so as to reinforce the importance of their position and to provide guidelines on management related issues. The first of these meetings was after initial extension activities had already been completed, so various administrative issues had begun to emerge. This meeting was also used to distribute forage seed and equipment (e.g. digital cameras) for them to re-distribute to each DAFEO. The second provincial coordinators meeting was held just prior to the exposure trip for District authorities (DAFEO heads and District governors) so that they could facilitate their learning (see Table 6.7, with details in Annex 4, Table 4.12).

Table 6.7 Provincial Coordinator Workshops in 2006 and 2007

Input	Date	Location	Participants	Key Objectives
Provincial Coordinators Meeting 1	18-19 June, 2006	Luang Prabang	PC – 6 PMU – 3 DLF – 2 (Dr. Chantaboun & Mr. Phanthavong)	<ul style="list-style-type: none">– Clarify & reinforce job description of PC– Review progress of activities– Review administration arrangements– Establish guidelines for monthly networking meetings– Distribute equipment (cameras, etc.) and forage seed
Provincial Coordinators Meeting 2	6 July, 2007	Vientiane	PC – 6 PMU – 3 DLF – 1 (Dr. Syseng)	<ul style="list-style-type: none">– Review activities for market awareness development and need for further support– Procedures for case studies– Data collection to be required for 2007– Hand-over guidelines between CBSLSP and NRSLLDP

A very significant input for the development of the Provincial Coordinators was the support provided to them by the PMU and from Mr. Souriyasack in particular. This comprised field visits every 2 or 3 months (see Annex 4, Table 4.13), along with close support via mobile telephone, which would not have been possible only a few years ago. It is doubtful that the PC could have performed effectively in such far flung areas without this mentoring by cell-phone from Mr. Souriyasack.

6.4 Linkage with NRSLLDP

Linkage with NRSLLDP was dependant on initiation of the project. The NRSLLDP was formally approved, and a NPD appointed in early 2007. Once this was done consistent efforts were made by CBSLSP to forge links between the projects. As the role of forages as an entry point for livestock intensification was relatively new, it was felt necessary to ensure that senior staff in DLF, the NPD for the NRSLLDP, and local authorities were familiar with this approach. This is not easily demonstrated. Simple indicators, such as the small areas of forages planted, measured in m², do not look impressive or demonstrate the real benefits. Indicators such as changes in the intensification of production systems can only be gained through careful monitoring and are not obtained easily.

From mid-2007 the designated NPD for NRSLLDP, Dr Syseng, was invited to all key CBSLSP activities, including the training workshops and the special events described below.

6.4.1 Joint Monitoring Trip – Livestock Development Strategies.

The two main objectives of the Joint Monitoring Trip (8-12 June) were (a) to familiarize key staff off DLF, and in particular the designated NRSLLDP NPD, with the extension and capacity building strategies used by CBSLSP, and (b) to agree on the hand-over of field activities from CBSLSP to NRSLLDP.

The participants included senior DLF officers, including Dr Somphanh (DDG) and Dr. Syseng (designated NPD for NRSLLDP), and Mr. Souriyasack. In addition, members of CBSLSP (NPD and TA) joined with PCs from three provinces. Site visits included Nong Het (model for cattle fattening) and villages in the trainee districts of Viengthong and Viengxay (Annex 4, Table 4.14).

The trip served to illustrate the value of the use of forages as an entry point for farmers and as a beginning for improved management of livestock, and how this could rapidly lead to more intensive systems being adopted. Local staff, both at the District and Provincial levels, who had gained capacity from CBSLSP, were articulate in describing their activities, results, and constraints.

The trip concluded in Luang Prabang with a morning meeting to review opportunities for NRSLLDP. It was agreed that support for all field activities in the six Trainee districts of the CBSLSP would continue until December 30 2007, with funds for field activities to be carried by NRSLLDP after this time.

6.4.2 Local Authorities Exposure Trip – household Impact / National Objectives.

The exposure trip for local authorities (9 & 10 July) aimed to ensure that they were aware of the impacts of CBSLSP and their relation to the national objectives of reduction of poverty and shifting cultivation and how these could be addressed through the use of forages. Following from the trip it was expected that they would then actively facilitate NRSLLDP activities in the future.

The field visits was conducted in Xieng Khouang and attended by District Governors and Heads of DAFEO from the six trainee district, along with PCs. The trip included presentations on the CBSLSP livestock development strategy, and field trips to sites where cattle and pig fattening were established. The participants were also addressed by Dr. Bounkouang, DG of DLF (see Annex 4, Table 4.15).

Evidence of a new level of support was evident: (a) District Governors in four of the districts conducted inspection visits of CBSLSP field activities in their districts in the month following the trip; and (b) some district (e.g. Vieng Phoukha) committed to use district funds to ensure work was not interrupted, if the NRSLLDP cannot mobilize funds. Following the visit, these district authorities were much better positioned to support and give priorities for activities of the NRSLLDP.

6.4.3 Study Trip: Daklak Vietnam – Macro-economic impact.

The aim of this trip to Daklak Province in Vietnam (26-29 August) was to expose senior staff to the macro-economic impact potential from livestock development that could be achieved based on forages and the different levels of intensification that could result.

The trip included senior DLF staff, Heads of PAFO from the five provinces included in NRSLLDP, and the PCs. Dr Werner Stür (TA for CBSLSP) and Mr. Phonepaseuth Phengsavanh (NAFRI-CIAT), who had coordinated CIAT work in Daklak, facilitated the trip. The group visited areas where farmers now invest in livestock development, fattening up to 10 head at a time, where cooperative linkages have developed between

farmers and traders to ensure regular supply, and where changes had been made in the lending policies of banks to provide credit for livestock fattening (see Annex 4, Table 4.16). As a result of the trip, the PAFO heads have recognized the economic potential that can come from the NRSLLDP.

6.4.4 External Assessments (November 2007)

To ensure that the results of the CBSLSP were exposed to scrutiny from professionals outside of the project, who could then vouch for the results, two assessments were commissioned, namely (a) an assessment of impacts in trainee districts by Dr. Chanthaboun (Head of Planning, DLF), and (b) an assessment of staff capacity development in trainee districts, by Dr Silinthone Sacklokham (Head of Department of Agricultural Economics, Faculty of Agriculture, NUOL). See Annex 4, Table 4. 17)

These assessments both confirmed the results that were achieved. They submitted reports in Lao (Dr. Silinthone's translated into English) and contributed presentations at the Lessons Learnt Workshop held by the project in December 2007 (see below).

6.4.5 'Lessons Learnt' Workshop (22 December)

The aim of the Lessons Learnt Workshop was to ensure that the results gained and the methods used were presented to key agencies within MAF. This in turn would hopefully generate discussion and confirm their continued application within NRSLLDP.

The workshop was attended by representatives of most departments of MAF, with representatives from the ADB, SDC, and related projects, such as NRSLLDP, EASLP, and the EU "Livestock Farmer Support Project" (see Annex 4, Table 4.18). Presentations included a description of project approaches, inputs, and results, and a synthesis of the assessments by the two contracted assessors. An additional session presented issues related to marketing of livestock (development of commercial animal health service providers and streamlining of trade procedures) by the Small-scale Agro-enterprise Development for the Uplands (SADU) project by CIAT.

The results were accepted by the participants with both the DG and DDG confirming that this work should be continued and expanded.

6.4.6 Guidelines for Project administrators and field staff.

Guidelines have been prepared which should assist both the project in planning inputs and field staff in conducting their activities in the field. This has the following sections

- phasing of activities and inputs
- extension approach used
- technical notes for livestock improvement
- Village Learning Activities

The phasing of project inputs has drawn on Working Paper No 8 from the PPTA in terms of the training inputs. This indicates the relationship of each training workshop to the stages of field work.

The extension guidelines were prepared for each step of work as they were needed in the course of the CBSLSP. The technical components of these were prepared in a final Guidelines Workshop conducted in Vientiane, which enlisted inputs from key mentor staff as well as CBSLSP staff. Samples of the technical notes and VLA sheets were then field tested with other staff. The guidelines are not included as an Annex, but are available as a separate document.

6.5 Results for Capacity Building - Provincial /National staff

The PCs in each province do now see the role of forage as an entry point for livestock development, and the partway by which farmers can progressively intensify their production. Similarly this is recognized by DLF, and through the Lessons Learnt workshop, by a wider group within MAF.

The capacity of the PCs to guide and administer activities varies. Mr. Lee Ja of Houaphanh deserves a special mention. He managed activities constantly, has been articulate in reporting, and thought constructively of ways to expand the impact of project work. He is already mentoring a second staff of the Livestock Section to assist as a second PC as the NRSLLDP will work in a total of 6 districts in Houaphanh province. The PCs in the remaining provinces should all be able to perform the task of coordinating the work of NRSLLDP effectively. Some structural issues exist: the PC in Bokeo is not a member of the Livestock Section, the PC for Luang Prabang is head of the section and has many other duties, and the PC for Xieng Khouang is only a technical staff of the section.

Within the PMU, Mr. Souriyasack also performed exceptionally well. He provided constant support to the PCs and staff in the field, administered the project diligently, and reported progress effectively within DLF. His style of management has been to give staff guidelines and then support their performance. This encouraged local staff to take a high level of ownership for the work and to adopt a problem solving approach.

Within DLF there does now appear to be a real appreciation of the role of forage as described above. The DDG, Dr Somphanh, and the Head of Planning, Dr Chantaboun, now articulate these approaches in other forums. In the end-of-year DLF meeting for 2007, staff were encouraged to use these approaches not just in the NRSLLDP but more widely as a general pathway to the development of livestock production to reach national goals. The DLF has a renewed interest to develop a new section on livestock feed and management, which is believed to have been strengthened by the experiences of CBSLSP. Thus there does appear to have been some affect on the strategic vision of DLF within MAF.

6.6 Lessons Learnt

Three main conclusions can be drawn from the experiences of CBSLSP:

- 1) The capacity of DAFEO staff can be developed within a period of 2 years to enable them to carry out extension to assist farmers reach Level 2 Intensification in their livestock systems. This is a fairly challenging objective for extension that involves 'systems change' across quite diverse environments. That this can be achieved is evident in the results seen in the field.

- 2) This capacity was gained from a combination of workshops, field mentoring, and peer exchange, both in monthly meetings and in bi-annual workshops). This is a fairly intensive level of training inputs, but this combination of methods appears both effective and efficient.
- 3) Staff would not have been able to initiate key activities in their first year without the support of mentors for these activities, particularly (a) conducting PRA and PD; (b) establishment of forage plots; and (c) review of forage use in Village Exchange Meetings.

The implications for the NRSLLDP are:

- Staff will be able to work independently at a basic level to initiate improvements in livestock production and to intensify this to Level 2 intensification for managed livestock.
- The existing NRSLLDP training package is understood not to include mentoring, but rather study trips. This should be reviewed and some degree of mentoring included at least during the initiation in all new districts. If this approach is to be used, however, then mentor staff will need funds to continue working actively in their own areas so as to provide working examples of more advanced field activities for extension.

There are a number of lessons for the implementation of the training inputs.

Field work

- Any tendency to expand the number of village and farmers more quickly to gain higher outputs earlier should be resisted. When initiating work in new districts, with a new batch of DAFEO staff, the first two years should be recognized as 'capacity building years'. An unnecessary focus on rapid expansion of the number of farmers and villages will result in staff being left behind, with limited confidence or ability to support farmers when issues do arise. Even with an appropriate rate of expansion in terms of the numbers of farmers and villages, the level of results and the impact on livelihoods during these restricted capacity building years was not minimal. Thus the NRSLLDP should plan something like:

Year 1 - four villages with about five farmers per village

Year 2 - expand the number of farmers and intensify production in the four 'old' villages
 - two new villages with unlimited numbers of farmers

Workshops

- The provision of two workshops per year is a relatively intensive input for capacity building, however, this does allow progressive inputs to be provided to staff a short time before they need to apply them in the field.
- Workshop structure has included a high level of review and discussion. This develops a sense of self-assessment, which is an important attribute if the staff are to deal with the day-to-day issues of extension. The exchange that occurs in the workshops provides a team spirit with the group, across districts, which leads to peer review and support, and thus professional commitment. This

aspect of the workshops should be retained for the NRSLLDP.

Mentoring function and implementation

- Mentoring events need to be structured and prepared by the mentor staff before each event. Guidelines provided to mentors for each event should include (a) the objectives of the event, (b) the activities to be performed, (c) any preparation needed (such as what type of villages to visit and what farmers need to discuss), and (d) the expected results.
- Mentoring was designed in two distinct ways: from old (mentor) districts to new (trainee) districts and from new (trainee) districts to old (mentor) districts. The functions of these are quite different. New staff traveling to Old districts provided staff with excellent examples of farmers gaining impacts and demonstrated the effective interaction between staff and farmers. CBSLSP conducted two of these in 2006. This is an expensive process and in future application could be limited to one initial trip at the beginning of the process. Greater benefit was gained from selected experienced, mentor staff traveling to new districts to mentor activities directly. This approach is not only more effective, but it is also more cost effective for a smaller number of mentor staff to travel to new districts than for the full team of new staff to travel to the mentor districts. If mentoring is used in NRSLLDP, and we hope that it will be, then it should be structured as (a) one substantial trip of new staff to old districts, then (b) trips at key times by the experienced staff to the new districts. On going exposure to new staff can be gained through study trips conducted in conjunction with workshops and monthly networking meetings.
- The mentoring function was designed originally to be applied in districts that are reasonably close. Providing mentoring to districts that require two days travel either way is impractical, risky and expensive, and should be avoided, if possible, in the NRSLLDP.

Monthly meetings

- The monthly networking meetings provided an on-going opportunity to monitor and support activities. This cannot be achieved with bi-annual workshops. These may appear to be rather minor events in comparison to large training workshops, however, their importance cannot be over-emphasized. The impact of the absence of monthly meetings was very noticeable for the two districts that missed them in 2006, Pha Oudom and Vieng Phoukha.
- While it is intended that the monthly meetings be a forum for informal exchange, PCs should facilitate the meetings to ensure that there is some structure to the event.
- Monthly meetings were an effective venue for incremental training, in particular for the mentor staff. This was applied to a greater extent in Luang Prabang, where incremental training was used, with evident impact, in achieving Level 3 Intensification for pig raising.

Linkages

- It is important that the work of DAFEO staff within the context of their DAFEO office is supported, both enabling activities to occur as planned and ensuring moral support comes from their supervisors. NRSLLDP thus needs to work

outside of the pure project context. It should pro-actively engage with local authorities to (a) ensure that its work is seen to support national objectives; and (b) the processes of work and activities of local staff are understood and supported.

7. PROJECT MANAGEMENT

CBSLSP has been working in a total of 11 districts across five provinces. Thus its scale of operation was not far short of what NRSLLDP will reach in its third year. The initiation of project activities across this wide area, with limited resources, has been challenging. Hopefully the experience can be used to develop lean management strategies that will be useful to the NRSLLDP.

7.1 Responsibilities

During the inception meeting basic levels of responsibility and the means for conducting work were discussed and agreed. These have been applied throughout the life of the project.

7.1.1 District level

DAFEO Heads were asked to support and monitor staff in the performance of their work according to the project plans. This aimed to ensure that work proceeded and was supported and that DAFEO heads became familiar with the strategies used.

To a large extent staff conducted project activities as planned. Activities have been on a small scale and thus below the focus of most DAFEO Heads so that work has been left to the initiative of the staff to proceed. Without the support from the Provincial Coordinators it is doubtful that the technical staff on their own would have been able to implement their workplan as well as they have. Following the Exposure Trip for Local Authorities (sect. 6.5.2) greater attention was given by DAFEO heads to the work.

The resources assigned to the six trainee DAFEO were allocated in a very frugal manner as there was concern that the addition of two extra provinces, as requested by the ADB and in comparison to the initial proposal, would impose major restrictions on the budget. Resources were allocated as follows:

Equipment:

- one motorcycle per two staff
- one digital camera per DAFEO

Operation:

- Per diem 30,000 kip /day when in their own area
150,000 kip /day when outside their area, such as for mentoring trips, including accommodation
- Fuel 3 liters / day at 10,000 kip per liter.
- Office materials 300,000 kip/month/office
- Field materials forage nurseries etc. (in kind)

For a DAFEO with four staff active in the field for eight days per month this would amount to regular funding of 2.2 million Kip or about \$220 per month.

For the five mentor districts, the funding support was similar to the above, but with

no equipment. Mentor staff were paid an additional 20,000 kip when they worked as mentors, both in their own district, or when off-site.

Funding was provided on a needs basis for maintenance of motorcycles. In the mentor districts, staff continued to use the motorcycles that were procured in 2001 by the FLSP project. Maintenance was required for these older motorcycles and if the mentors are to continue to provide an input into NRSLLDP, then some consideration will need to be given to providing new motorcycles for them.

7.1.2 Provincial level

Provincial coordinators were asked to support the DAFEO staff to conduct field activities according to the plans, and to manage the dispersal of funds for all districts in their province. In the case of Xieng Khouang and Luang Prabang, this was a substantial load as they contained the greatest number of districts, both mentor and trainee, and also had to administer mentoring and workshop activities.

While the Provincial coordinators had the role of supporting the DAFEO staff, it must be remembered that in the three new provinces (Bokeo, Luang Namtha and Houaphanh) PCs themselves were not familiar with the role of forages as an entry point to livestock development. Thus, in addition to the management of activities, they also had to gain familiarity with the technical aspects of the work. Provincial level responsibilities were reinforced in the PC Meeting in June 2006 and a TOR prepared, Annex 4, 4.18.

Resources provided to the Provinces were as follows:

Equipment for the PAFO office

- One computer and peripherals, including a printer, per PAFO
- One digital camera
- One motorcycle

Operation:

- Per diem 40,000 kip /day
- Fuel 4 – 800,000 kip / month
- Office materials 300,000 kip /month
- Communication 400,000 kip / month

This comes to general operating costs of about \$170 per month, which was adequate, except when there were high levels of field work.

The performance of the PCs was variable, with Mr. Leejar in Houaphanh performing exceptionally well, the two in Bokeo and Luang Namtha being challenged by the accessibility and isolation of their districts, and the two PCs in the anchor provinces of Luang Prabang and Xieng Khouang having to balance CBSLSP responsibilities with many other competing activities.

Despite these problems, in all provinces the Provincial Coordinators have played an essential role and field activities would not have succeeded without their support. The burdens of financial management have been too great and this required the employment of junior accountants in Xieng Khouang and Luang Prabang in 2007.

7.1.3 Fund dispersal and acquittal

Dispersal of operating funds was by transfers to the provincial accounts managed by the PC and then to the DAFEO. All expenses were acquitted with receipts. In order to ensure clarity, staff provided monthly time sheets listing their activities for each day of the month. It should be possible to use these time sheets to then allocate funds for fuel and maintenance as a lump sum, rather than collecting and processing numerous receipts. Such a system would greatly reduce the accounting burden and encourage responsibility for care of motorcycles by the staff.

To facilitate the tracking of dispersal and acquittal of funds for such a large group of partners a bilingual (entry and reporting in either Lao or English) Expense Tracking database was piloted for funds used at the operational level of the project. This linked requests for funds (advances) with acquittals, and thus allowed tracking of outstanding advances, and allowed for the analysis of expenditure against site and type of expenditure. The database could have been implemented more fully and used more effectively throughout the project, rather than being partially introduced later in the project. Such a program could have played (and in the NRSLLDP could play) a major role in the development of some basic capacity for financial management by the PCs.

7.2 Project Management Unit (PMU)

7.2.1 Management Responsibilities

The PMU was established in the DLF compound in Ban Khountha, adjacent to the Mekong, and furnished with basic office equipment. As well as Mr. Souriyasack (NPD) and Mr. Bounthavong (Technical support / trainer), one office assistant was employed. The PMU coordinated all field and training activities as well as prepared monthly plans and budget requests, based on submissions from the provinces, which were submitted to the CIAT office as requests for advances. The processing of all of the provincial/district acquittals took a great deal of time and was frequently behind schedule in the early part of the project due to slow or inadequate reporting from Districts and Provinces, so an additional administrative assistant was employed. With time, the PMU was able to process most acquittals within a month, except when the level of field activities was very high.

7.2.3 Technical Assistance

Technical assistance was provided by three consultants from CIAT, all of whom had other activities in country. The fact that the consultants were based in Laos much of the time allowed support to be provided on an incremental and sometimes monthly basis. It has been invaluable to the PMU to have access to this regular and timely consultant support rather than the more normal style of TA support, with periods of intense support and periods with no support.

The main foci of the Extension advisor through 2006 was to initiate the project and to (a) ensure that training and field activities are suitable and proceed in a timely and effective manner, (b) support the management structure, both the PMU and the Provincial Coordinators, to ensure that they gained the necessary capacity

improvement, and (c) coordinate the TA. In 2007 the main focus in the field was on the introduction of methods that would scale out the results in the trainee villages and for farmers to gain market awareness in the mentor districts. In regards to project management, the main focus was to ensure that all aspects of the project were completed and that linkages were developed with the NRSLLDP.

The Forage agronomist provided key technical guidelines for the interventions that led the 'old FLSP' mentor districts to shift towards integrated and more intensive livestock production systems. This was a significant shift to accomplish, and has only achieved late in 2007. A key focus in 2007 was the development of technical notes and field guidelines.

The Livestock Management and Health specialist focused on the development of practical options improved livestock management, particularly for improved pig management, including simple but effective housing, and targeted animal health interventions. By the end of the project these improved management options were applied at quite significant levels in the selected ex-FLSP villages, with consolidated impacts in 2007. The detailed technical inputs were provided in mini-sessions during monthly meetings. The results are clear in Luang Prabang, with the development of Level 3 intensification for pig raising.

With the additional requirements of two extra provinces and with work developments as the project progressed, it was realized that some changes were desirable in the amount and type of TA support. In the end, two contract variations were requested and approved with regard to the TA. Firstly, the TA for the Livestock Management and Health specialist was increased by 2.5 months, with 50 of these additional days as field days. This was due to the additional time required of this TA in terms of travel to different provinces and the more detailed support required for the DAFEO staff, particularly with respect to improved pig production systems. Secondly, the TA on Extension was increased by 16 days, partially funded by a decrease in the number of field days for the Extension and Forage Agronomist TAs. This increase was required to allow for more time in management and planning of activities and for documentation of field guides, etc. The reduction in field time for the Extension and Forage Agronomist TAs was partially because it was realized that more time was needed for planning of activities and documentation, and partially because the Livestock TA, who spent more of his time based in northern Laos, was spending more time in the field.

7.2.4 Monitoring of field activities.

A range of strategies were used for monitoring progress and results.

Progress of field activities were essentially self-monitoring, with acquittal of expenses providing feed-back on when and how the activities were carried out. Field trips by PCs and PMU confirmed activities in the field and were perhaps the key element in monitoring activities. The role of the PCs to ensure that activities did proceed according to plan at the district level has already been noted (7.1.1.1). Other activities, such as data collection, case study writing etc., required direct support by the PCs.

Output and results from the trainee staff played a key role in reinforcing their perception of their own performance. Initial reporting on results was made on gross indicators

(number of households, areas of forages) as well as assessment of quality (quality of forage establishment). These were reported in the training workshops, and then backed up by purpose designed questionnaires. In 2007, assessment went beyond these gross indicators to also assess impact on production and livelihoods. Data collection was made a specific field event for the staff. They reported on changes in production systems on a village basis, and on impacts through writing of case studies. This data was again presented in workshops for self assessment and peer review.

The focus of mentor staff was on the development of systems change. The data required for such assessments are more challenging than the gross indicators referred to above. Assessment of systems change was aided through the development of picture forms based on the levels of intensification in Figure 1. Staff reported against each type of intervention. Such assessments are subjective and the assessment can vary between staff, however, the reports provided a useful indication of definite trends in practices.

While the monitoring data that was collected did rely on staff assessments, by both trainees and mentors, it was further checked by the field trips made by PCs and by PMU and TA staff. These visits confirmed the general results achieved. In November 2007, the ADB conducted an "Evaluation of ADB's Poverty Reduction Technical Assistance Trust Fund". This evaluation made field visits to Phonexay district, which was about middle in terms of performance for CBSLSP, and this field visit also confirmed the general results being achieved, and rated the project as 'highly effective'.

Table 7.1 Technical Assistance provided by CIAT

Consultant	Name	Duties	TA Time	
			Initial Contract	Actual input ¹
Extension	John G Connell	<ul style="list-style-type: none"> Overall project strategies Planning of activities on a monthly basis Preparation of training team and content Conduct of training events Field monitoring Establishment of management structure Management support Preparation of guidelines for mentoring Preparation of technical materials Liaison with ADB Liaison with DLF 	6 months with 66% in the field	6.533 months with about 30% in the field
Forage agronomist	Werner Stur	<ul style="list-style-type: none"> Review of field status Establishment of technical interventions Preparation of training materials Conduct of training for mentors 	3 months with 66% in the field	3 months with about 35% in the field
Livestock Management and Health	Gavin Varney	<ul style="list-style-type: none"> Field review and monitoring of activities Identification of interventions for intensified production Preparation of technical guidelines Technical support in training in monthly meetings and in the field 	2 months with 66% in the field	4.5 months with 66% in the field

¹ The actual input matched the contracted time after the approval of contract variations

7.2.5 Expenditures and Status of Funds

Management of the activities across 11 districts of 5 provinces has been challenging, especially for staff with no previous project experience. The main challenges have been with rigorous reporting procedures, particularly for expenditures. Particularly in the early stages, several rounds of submission of acquittals were often required before they could be accepted. This was particularly difficult for the more isolated districts. Even when funds were not being acquitted adequately, the dispersal of funds from CIAT to the PMU and from the PMU to the provinces and districts continued throughout the year to ensure work proceeded, especially during the wet season.

As the project proceeded, it became evident that some variations in the contract would be highly beneficial to the implementation of the project. While some of these changes were predicted, or at least considered, early in the project, the contract variation requests were staggered through the project to make sure the best use of funds could be assured, especially when the budget was so tight, having been intended initially for only three provinces.

A total of three contract variations were required. The first, in January 2006, was required as there were some errors in the preparation of the initial contract document whereby some of the components of the contract did not add up to the subtotals. The second and third contract variations were requested in March 2007 and March 2008.

The main parts of the contract variations were:

- Changes in the amounts of TA for the Extension and Livestock Management and Health Experts (see section 7.2.3)
- Increased national technical assistance for training
- Purchase of 12 additional motorcycles so that the 24 trainee staff do not have to share motorcycles (initial purchase was one per team of two)
- Purchase of digital cameras for the National Technical Assistant and to replace the old cameras of the mentors
- Additional office equipment for the PMU (laptop, printer, scanner, digital projector)
- The cross-visit to Daklak Province in Vietnam, which was proposed to provide clear working examples of more intensified livestock production systems
- Additional funds for workshops to cover some higher than expected costs and some additional workshops to prepare the technical notes, assess staff capacity and impacts, and provide a fora for lessons learnt from the CBSLSP, especially for DLF, MAF, and the NRSLLDP.
- Additional funds for transport and communications, due to higher costs and/or higher usage.

These contract variations were funded from the contingencies and in variations in some budget lines, such as the per diems associated with the amount of TA time spent in the field and the amount of field staff time in the field, etc.

Final assessment of accounts indicates that (a) all of the contracted TA was provided (and some additional amounts of TA were provided without charge) and (b) the total expenditure, and thus claims, on Reimbursable Payments amounted to a total of US\$149,108, which is \$876 more than the contracted amount after the final Contract Variation, and (c) expenditure on land transport (one of the non-reimbursable payments) was \$6,430 more than budgeted due to higher fuel costs, additional travel for meetings and workshops, and higher vehicle maintenance. The budget for this

project was tight, following the expansion of geographic coverage from the initial proposal, but without any additional budget. Despite this clear restriction, and through judicious management at all levels of the project, at the district, provincial, and national levels and by staff of the Government of the Lao PDR and of CIAT, we feel the project has been well executed and largely within budget with a total over-expenditure of \$7,306 (about 1.3%) and an over-expenditure of reimbursable payments of less than 0.6%.

7.3 Lessons Learnt

The realities of managing project activities over such an extended line, from the national to provincial and district levels, was a great challenge. The experiences with fund dispersal and acquittal procedures were new to many in the project staff and the experience should enable staff at the provincial and district level to cope with similar requirements as part of the NRSLLDP.

Processing of expenditure reports remained a burden throughout the project. This process needs to be simplified by making payments much more output based. Using the monthly time sheets of reach staff, should allow three allowances to be linked to the time in the field; (a) Per diems as is already the case; (b) fuel, as is the case but receipt are still required; and (c) maintenance which is currently paid on a needs basis, which always requires negotiation. A daily rate for maintenance could be calculated based on days in the field, age of motorcycle, and paid with the per diems and fuel. This would encourage staff to look after the motorcycles they use. If such a system had been adopted at the beginning of the project (and is adopted in the NRSLLDP) it would have required only timesheets to be verified by DAFO Heads against plans, without any need for receipt for fuel etc., thus reducing the time spent on these acquittals at both the District and PMU levels.

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8.0 MARKET RELATED ISSUES

The CBSLSP has demonstrated a pathway for the intensification of livestock production in rural areas of Northern Laos. This has the potential to increase productivity of both ruminants and pigs by at least a factor of two. As this intensification accelerates, the conventional approaches to improvements in production that have initiated will need to be supported by other activities related to market issues. These fall into three main areas:

(a) Development of the market awareness of farmers

This includes such activities as conducting PMCS so that they understand market requirements and thus understand the need to intensify their production even more to meet these demands. This will promote a demand from farmers for help with more intensive technologies from DAFEO staff.

(b) Establishment of services

Some aspects of improved production cannot be achieved without services being available. Such services include animal health, improved breeding management, etc. As such service providers emerge, as they work across villages they will inevitably provide an embedded function of extension of technologies and systems change.

(c) Establishment of supply chains and streamlining trade procedures

Farmers and traders have tended to have either very minimal linkages or rather adversarial relationships. As both parties shift from attempting to maximize their profit from each transaction, for each animal sold, to focusing on matching the market demand by moving larger volumes of animals of the desired quality, so they will need to enter into new more cooperative relationship in which each party recognizes their dependence on the other. Even when such relationships have developed, however, trade procedures will have to be streamlined in order for animals to be moved in volume but with adequate protection against disease transfer.

These three areas have been examined and new approaches piloted within the Smallscale Agro-enterprise Development for the Uplands (SADU) Project by CIAT. Some of the outcomes of SADU that relate to the three points above are outlined below.

8.1 Development of the 'market awareness' of farmers

Examples of increased market awareness by farmers were noted in Khoun district with regard to poultry production. A small group of farmers had improved their poultry production following a traditional training input. After a PMCS and a Kumban (Sub-district) meeting between farmers and traders, the number of farmers interested in improving production increased in both the original village and additional villages. Trading patterns also changed in that:

- (a) farmers agreed to sell younger chickens
- (b) farmers sold batches of chickens (15-30) and thus received a lump sum, which had a greater impact on their household incomes than selling one bird at a time.
- (c) Prices increase from 23,000 to 25,000 kip per kg due to improved quality and selling in larger batches
- (d) traders began to make appointments for the collection of batches of chickens

Such changes were small in relation to national economics but important in relation to poverty reduction. At the same time they indicate that changes in trading relationships can be facilitated.

Similar results have been gained in CBSLSP (see section 5.2.4.3), with farmers both showing increased interest in more intensive technologies and in group trading.

8.2 Establishment of Service Providers

Animal health remains a critical issue for farmers in northern Laos and it will become an even more important issue as farmers move towards Levels 2 and 3 of intensification. As Laos begins trading large numbers of animals it will become increasingly important to demonstrate that it has a viable animal health system in place to allay the concerns of its trading partners.

Traditional project strategies have relied on the development of village volunteers who have been trained in vaccinating against major diseases, but typically these services have lapsed once projects have closed. Another concern is that animal health services will need to move beyond vaccination against the major diseases and begin to include diagnosis and treatment procedures as well, if they are to answer the needs of farmers.

SADU piloted a model of 'commercial animal health service providers' who:

- (a) worked on a profit basis and thus had the potential to be a sustainable service if sufficient work could be found
- (b) worked across villages and thus had a significant volume of work
- (c) provided other services, including diagnosis and treatment procedures

This approach was piloted in 2006, in four Kumban in Paek district, Xieng Khouang, where farmers have already begun to manage their animals based on forages and focus on animal production for sale. Given that these CAHSPs were to get income from their skills, training was partially costed and those interested had to pay 300,000 kip for a five-day training and follow-up support.

Considering the 13 farmers who were trained:

- (a) Nine are still actively providing services to other farmers
- (b) Vaccination in their 'home' villages have increase from 20% to 80%
- (c) They provide a range of other veterinary services, including the treatment of sick animals, assisting with birth of calves, etc.
- (d) The mortality of ruminants in their villages declined from 'a lot' in 2005, to 31 in 2006, and 9 in 2007.
- (e) Services were supplied by the nine active CAHSPs to other villages outside of their 'home' villages, including 6 additional villages in 2006 and 11 additional villages in 2007.
- (f) There are reports that the CAHSP are recommending farmers to plant forages for healthier and better animals, and so are providing an extension force.

The CAHSPs have made a clear profit after all costs of between 0.8 and 2.6 M Kip per person. At this stage the services are being sustained and indeed increasing. This has been replicated in Khoun and Nong Het districts and initial results appear to be similar. This model will be formally reviewed by DLF in early 2008.

This model fits with activities planned for later stages of NRSLLDP to support the development of service providers. A similar model could be applied to other services such as the supply of planting materials for forages, the supply of fish fingerlings, etc. In the case of forage planting material, care will need to be taken to ensure that the project does not plant more than is needed to simply initiate the use of forages. If this initial level is reached with project support, then this will create demand, which a service provider can then respond to dynamically

8.3 Market Links

Examination of the market chain for pigs in Luang Prabang showed that there were weak links between traders and farmers. This is despite the increase in demand over the last 5 years, and the projected further strong increase in demand, due largely to tourism. Traders now find it hard to source animals and so have been willing, in some cases, to import from Thailand in order to gain regular supply and consistent quality, with a premium of 20% over the cost for local pigs. Other issues / opportunities also exist in the demand for particular types of pigs (e.g. muu lart and muu pun), and the need for improved slaughtering to produce better 'cuts' for the local restaurant market.

Work by a number of CIAT projects¹⁹ has shown that farmers can double the growth rate of pigs, at the same time as producing meat with higher muscle content. CBSLSP has demonstrated that such technologies can be delivered to farmers and, in response, farmers have intensified their production systems. With greater opportunities for farmers to increase their income through improved pig production there are associated risks that medium to large piggeries could be established and so eliminate this emerging opportunity for smallholders.

What is needed are cooperative trading relationships between farmers, who are now in a position to supply pigs, and traders, who are willing to purchase at premium prices to serve the regular and growing markets. SADU will attempt to build linkages between the farmers in Luang Prabang who have intensified production and the traders for local and export markets. This will help consolidate some of the gains made in pig production through CBSLSP and provide an opportunity for NRSLLDP.

8.4 Trade Procedures

The market chain for livestock in Xieng Khouang has been studied by SADU, beginning in 2004. These studies have shown that

- (a) There is a high level of non-compliance by traders with procedures, resulting in loss of revenue to the province estimated to be about \$0.2 million in 2004 and \$0.1 million in 2006.
- (b) The trade of livestock to Vietnam that was recently a combined total of about 10,000 head of cattle and buffalo has dropped to zero since the beginning of 2007. Factors such as reductions in credit provisions in Vietnam for the purchase of breeding stock may have caused some of this decline.

¹⁹ Earlier in the AusAID-funded FLSP and currently in the Legumes for Pigs Project (L4PP) funded by ACIAR

The non-compliance with trade procedures is due to the cumbersome procedures to pay taxes and obtain authorization for the movement of stock. The loss of the market to Vietnam is far more serious, representing 2/3 of the trade of livestock from Xieng Khouang and coming just at a time when projects such as NRSLLDP can increase productivity by 100% or more²⁰. It appears that there will be a continuing demand for beef in Vietnam²¹, and but that cumbersome trade procedures may be part of the reason why traders in Hanoi finding it more convenient to purchase for China.

SADU has conducted two provincial level workshops (18 January, and 26 July 2007) to review these trade issues. As a result the province has decided to take the following action

- (a) broaden the role of the Provincial Committee for Forage establishment to address all issues related to development of market-oriented livestock production
- (b) review trade procedures, in particular to standardize documents and procedures across all districts; establish one-stop-shops for authorization of trade and payment of fees; review the level of combined fees to be paid
- (c) work with other agencies to reduce the roadside checkpoints

These activities and others will enable the province to streamline trade and thus position itself to trade livestock in an efficient manner that meets trading partner demands. Affirmative action is still to be taken. These results were presented in the Lessons Learnt Workshop and, as a result, DLF intends to form an inter-ministry committee to identify action needed to streamline trade procedures.

²⁰ Daily weight gain measurements show increases from 0.2 kg/day for free-range grazing to 0.5 kg/day for animals that are penned and hand feeding forages, such as in the systems used by farmers in Nong Het and Paek. In addition, in traditional systems fertility rates can be as low as 40% due to the poor condition of cows, with slow postpartum recovery due to poor feed. In villages with adequate feed, fertility rates are 80 -90%. Thus an increase in production output of 100%, through improved growth rates and fertility rates, is quite achievable.

²¹ Projected demand for beef in Vietnam for 2010 is 3-6 – 4.2 kg/head while the supply capacity will lag behind at 3.0 kg/head.

ANNEXES

ANNEX 1. STAFF ASSIGNMENTS

Table 1.1 National and Provincial Staff

Position CBSLSP	Staff	Current Position	Background
NATIONAL			
Project Director / Trainer	Mr. Souriyasack Chayavong	Deputy Head Planning, DLF	EU facilitator
Technical Support / Trainer	Mr. Bounthavong Kounnavongsa	LRC, NAFRI	LLSP facilitator
Province	Position CBSLSP	Staff	Current Position
Luang Prabang	Provincial Coordinator/Trainer	Mr. Saengprasith Thongsavith	Head Livestock Section, PAFO
Xieng Khouang	Provincial Coordinator/Trainer	Mr. Khampai Phommavong	Staff, Livestock Section, PAFO
Bokeo	Provincial Coordinator	Mr. Singthong Souiya	Planning and Foreign cooperation
Luang Namtha	Provincial Coordinator	Ms. Chemakhong Phaychith	Acting Head, Livestock Section, PAFO
Houaphanh	Provincial Coordinator	Mr. Leejar Xayveenou	Deputy Livestock Section, PAFO

Table 1.2 Mentor Staff ('old' FLSP Districts)

Site / Position	Staff	Current Position	background
Luang Prabang	Mr. Thavone Mani	Dist. Extension	FLSP
	Ms. Chanh Samone Bialao	Dist. Extension	FLSP
	Mr. Somsak Inthasone	Dist. Extension	FLSP
	Ms. Thongbay Siesomphone	Dist. Extension	FLSP
	Mr. Kenchanh Bounpanyavong	Dist. Extension	FLSP
	Mr. Vongdeuane Kilasakid	Dist. Extension	FLSP
Xieng Ngeun	Mr. Vayie Yangcheakoa	Dist. Extension	FLSP
	Mr. Somvanh Phommali	Dist. Extension	FLSP
	Mr. Sidaphome Thammavong	Dist. Extension	FLSP not available
	Ms. Keosakon Khunsamathong	Dist. Extension	FLSP
	Mr. Sengpeth Sisouk	Dist. Extension	FLSP
	Mr. Bounthavanh Songkhalai	Dist. Extension	FLSP
Pak Ou	Mrs. Chamsouk Chanthanoun	Dist. Extension	FLSP
	Mr. Thongkham Vongpralath	Dist. Extension	FLSP
Paek	Mr. Viengsuk Lorbrayao	Dist. Extension	FLSP
	Ms. Sin Phuttapanya	Dist. Extension	FLSP
	Mr. Viengxay Vannaphoum	Dist. Extension	FLSP not available
	Mr. Khamphone Boulavong	Dist. Extension	FLSP
	Mr. Keonong Sipaseuth	Dist. Extension	FLSP
	Mr. Davanh Doungtanuson	Dist. Extension	FLSP
Nong Het	Mr. Kuthao PiaLuang	Dist. Extension	FLSP
	Mr. Neuakoum Theppanith	Dist. Extension	FLSP
	Mr. Kaoyang Yongma	Dist. Extension	FLSP
	Mr. Thavong Philavong	Dist. Extension	FLSP
	Ms. Chongpeth Phomvisay	Dist. Extension	FLSP

Note: names in bold indicate 'senior mentors' who traveled as mentors in trainee districts.

Table 1.3 Trainee staff assigned (future NRSLLDP sites)

Site	Staff (including changes in staff)	Current Position	Background	Date of change
Pha Oudom	Mr. Bounkhong Thavisth → Ms Bouson Daopachun	DAFEO	Livestock	Nov '07
	Mr. Khammang Manieuan → Mr. Udon Latsavong	DAFEO	Irrigation	Nov. '07
	Mr. Toh Xaiyavong	Contract	Livestock	
	Mr. Bouyee → Ms Bouathip Inthapanya → Ms. Nouchun Thasouk	Contract	Livestock	Sept. '06 Nov. '07
Vieng Phoukha	Mr. Nasavat	DAFEO	Livestock	
	Mr. Inpang Vannakham	DAFEO	Livestock	
	Mr. Wattana Kongsana	Contract	Livestock	
	Ms. Samouan Adphasouk	Contract	Livestock	
Phonexay	Mr. Soudaphon Ladsamy	DAFEO	Livestock	
	Ms. Somchith Vongpadith	DAFEO	Livestock	
	Ms. Bouakham Phengsakta	Contract	Livestock	
	Mr. Hevang → Mr Khamjar Keudnidkhamy	Contract	Livestock	August '06
Khoun	Ms. Kingkeo thammavong	DAFEO	Livestock	
	Mr. Phadphiloum Keobouaphanh	DAFEO	Livestock	
	Chanthaphone Phanthady → NOT REPLACED	Contract	Livestock	Mar '07
	Mr. Souliphon Inthaphone	Contract	Livestock	
Viengxay	Ms. Chai Phomphet	DAFEO	Livestock	
	Mr. Amphay Phoummanolad	DAFEO	Fisheries	
	Mr. Somvang Xaytorh	DAFEO	Livestock	
	Mr. Amphone Thonghouvong	Contract	Livestock	
Viengthong	Ms. Phaysook Phoudthapanya	DAFEO	Livestock	
	Ms. Anoussone Khammuankhune	Contract	Horticulture	
	Mr. Boumee → Ms. Phounchanh Phomphet	Contract	Livestock	Sept. '06
	Mr. Soulinxay Phongsavath	Contract	Livestock	

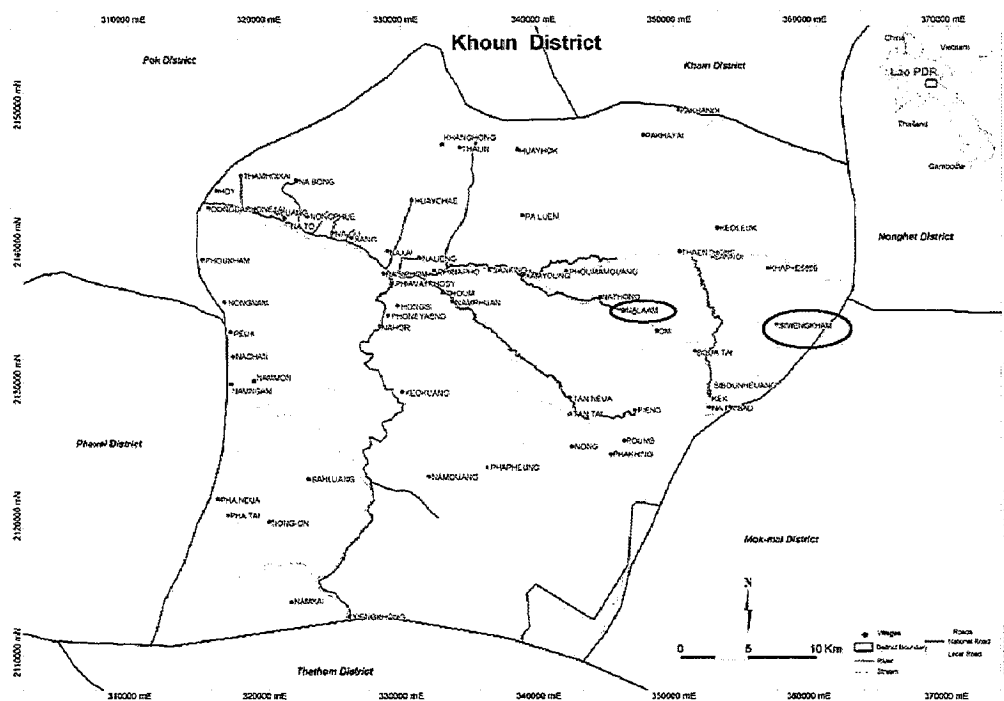
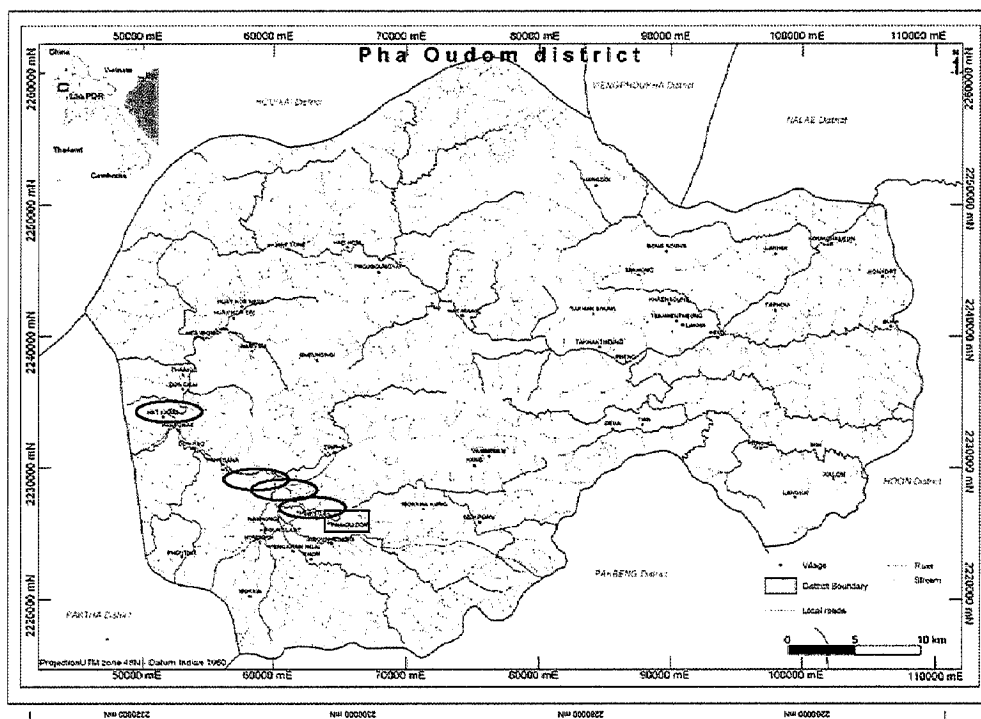
ANNEX 2. CBSLSP SITES AND CHARACTERISTICS

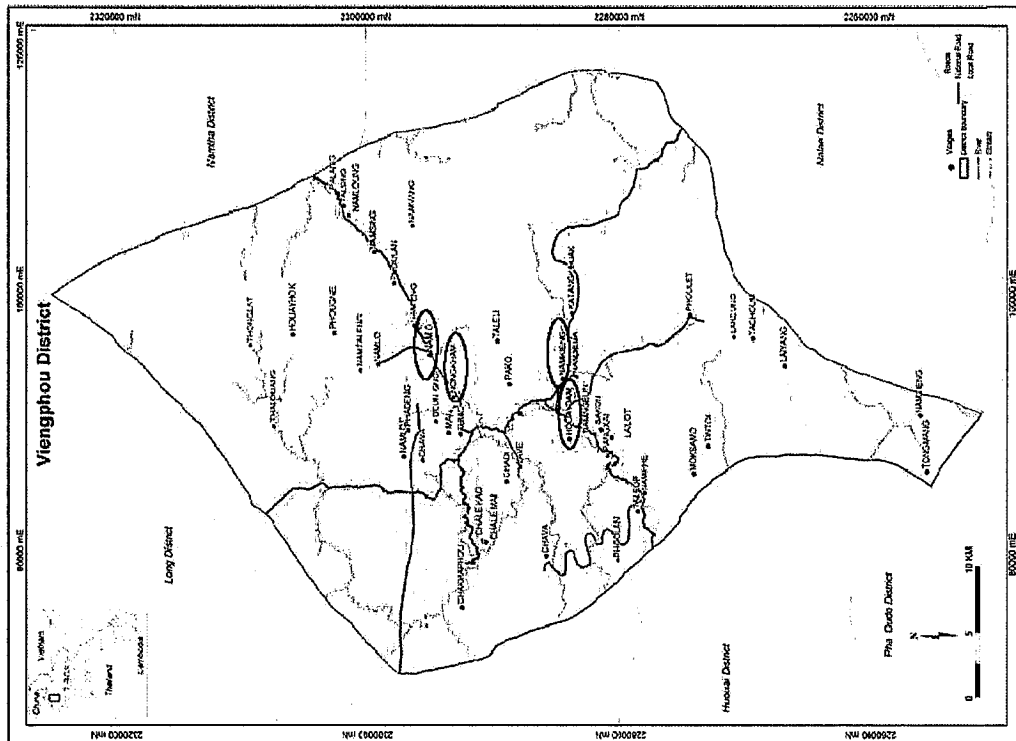
Table 2.1 Village Demographic data for new districts (future NRSLLDP districts)

Province	District	Village (Name)	No HH	Ethnic	Animals					Production			Access				
					Cattle	Buffalo	Pigs	Goat	Horse	Poultry	Fish pond	HH/naa	HH/hai	dist (km)	All year	d.s	
Bokeo	POD	Xay Oudom	139	Hmong	51		65	32	-	800	-			2	✓		
		Hadkham	36	Lamet	40	24	100	50	-	519	-			16	✓		
		Nahome	37	Lamet/Leu	31	58	100	-	-	680	-			5	✓		
Luang Namtha	VPK	Xaysavang	49	Lao Loum		90	80	-	-	500	-			3	✓		
		Namkiang	45	Khmu	45	77	350	3	-	550	-			15	✓	✓*	
		Nongkham	117	Kuaen	4	128	1,226	16	-	2,500	-			4	✓		
		Nam O	147	Kuaen	80	100	254	27	-	2,000	-			8	✓		
Luang Prabang	PHX	Phonethong	86	Gnuan	5	20	150	17	-	20	-			15	✓		
		Donexay	74	Khmu	-	65	160	60	-	638	-			19	✓		
		Houaysignua	86	Khmu					-		-					✓	
		Phakhok	90	Khmu	4	9	37	201	-		-					✓	
Houaphanh	VIX	Houameuang	81	Khmu	35	118	162	244	-	200	-			35	✓		
		Nakhao	56	Hmong	87	36	32	-	6	319	-	11		15	✓		
		Phounkang	31	Thai Deng	27	58	100	-	-	376	-	32	10	36	✓		
		Kangpabong	66	T.Deng/Khmu	58	110	282	7	-	961	4	41	25	22	✓		
		Phounneua	55	Thai Deng	50	69	204	-	-	1,088	-	56	56	35	✓		
Houaphanh	VIT	Namneun	46	Hmong	214	59	120	-	-	1,000	-			28	✓		
		Bouamfad	32	Hmong	60	9	220	-	-	600	-			30	✓		
		Meuanghiam	48	Lao Loum	40	50	120	-	-	300	-			0.5	✓		
		Samphanhthong	74	Lao /Hmong	20	25	71	-	-	300	-			0.5	✓		
Xiang Khouang	KHO	Namlanh	35	Hmong					-		-		35	0	30	✓	
		Nalam	81	Hmong	135	76	25	-	4	725	-	76	5	20		✓	
		Thenephoun	76	Lao /Khmu					-		-	76	0	42		✓	
		Siviengkham	57	Lao /Hmong					-		-	57	0	38	✓		

Note: Villages in BOLD were sampled to assess characteristics and issues (section 4.3.2)

Figure 2.1 Maps of 6 trainee districts with target villages





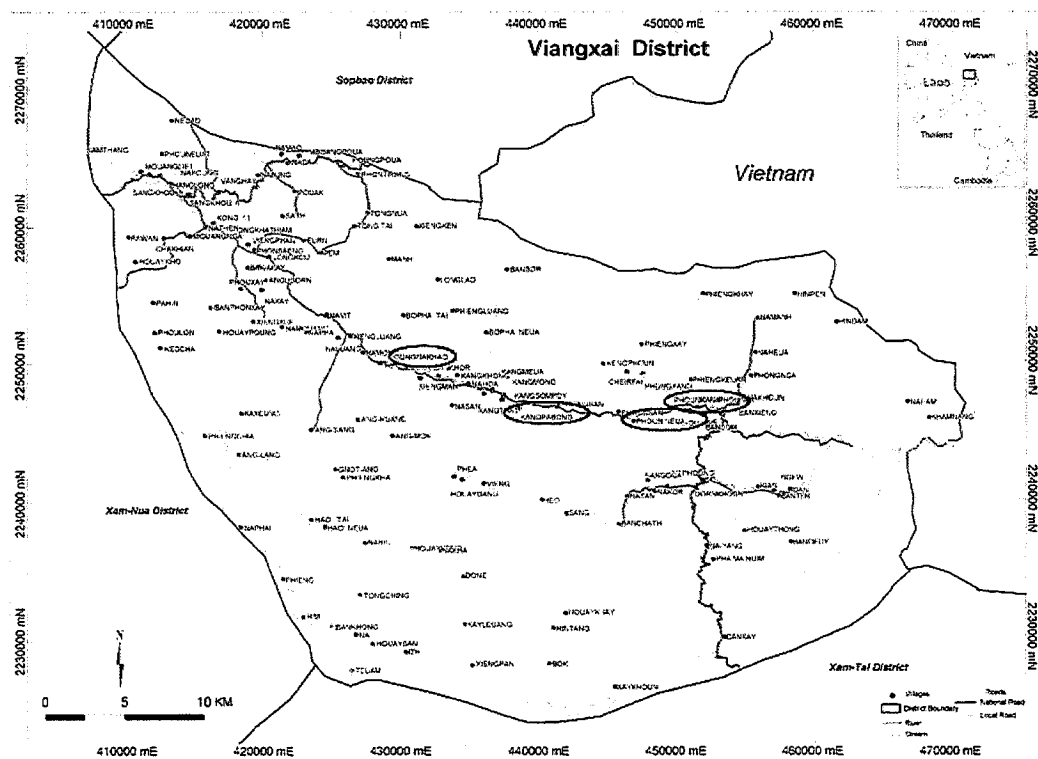
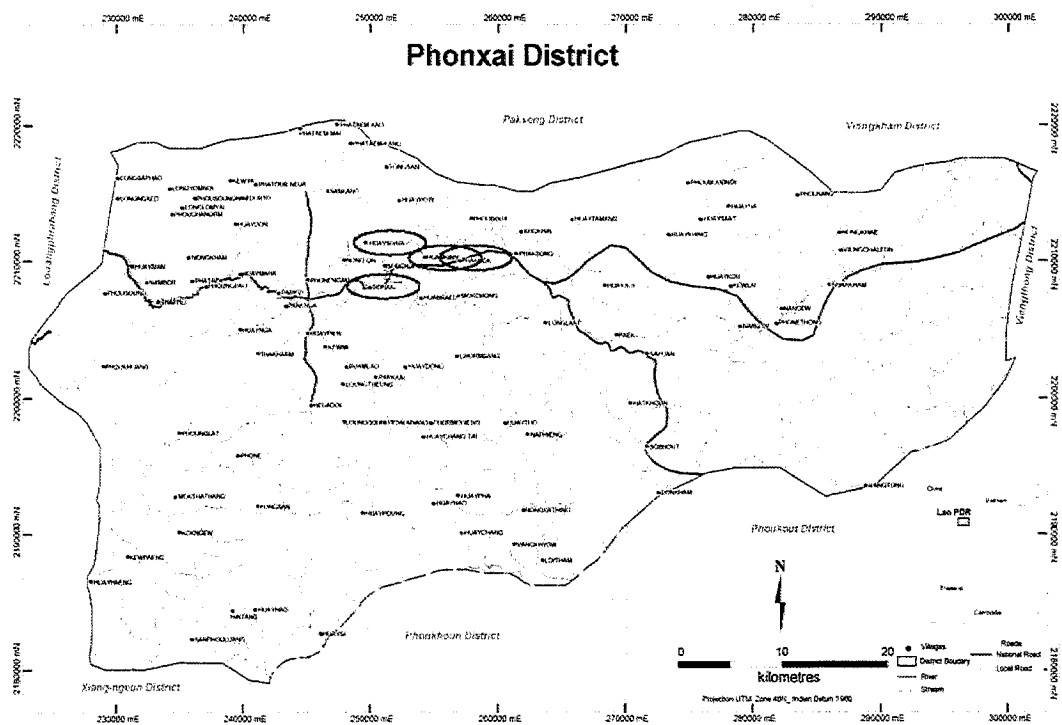


Table 2.2 Field assessment of livestock management practices in selected villages in the 6 new districts

**Xaysavanh Village,
Pha Oudom District, Bokeo Province
14/09/2006**

Introduction

Pha Oudom District is situated in the eastern part of Bokeo Province approx 65kms south-east of the provincial centre of Houei Xai. Travel to and fro by car and/or boat can be challenging but a soon to be completed upgrade of the road and bridge will improve present infrastructure and provide better access to markets and other facilities.

The district enjoys a large area of lowland suitable for paddy cultivation as well as an expanse of rolling upland where cassava, maize, peanuts, sesame and some vegetable crops are grown. Upland rice, grown under slash and burn shifting cultivation conditions, continues to be grown in the more mountainous areas.

Ban Xaysavanh is a Leu village situated 4 kms north-west of Pha Oudom District township. The village settled into its present location in 1983 after moving from Oudomxay Province. The present population is 227 (122♀), and is made up of 55 families in 49 households. Adjacent to the village is a large expanse of paddy of which 28.29ha belongs to the village. On the rolling land surrounding the village maize, cassava, sesame and peanuts are grown and 15ha has been allocated for buffalo grazing.

At the time of the survey, 11 families owned buffalo (90), 13 raised pigs (80) and almost all owned poultry. Pig numbers are low because of losses through disease and farmers selling before the wet season (disease). Many plan to purchase pigs for fattening within the coming months.

Traditionally, livestock have played an important role in providing status and family well-being, education and health needs, security and cash accumulation, for festivals and ceremonies and money for household necessities. Buffalo are no longer required for draft purposes as almost all households now cultivate their land by tractor. There is district regulation on the control of animal movement, no animals are to be left unattended in the crop growing area and families are no longer allowed to buy, sell or consume sick or dead animals.

A recent village PD conducted by the CBSLSP Project identified animal disease, lack of dry season feed, crop disease, shortage of labour and animal encroachment into vegetable/crop areas as the five major constraints to animal production (refer PD). Surprisingly, lack of credit was not identified as a constraint but farmers did acknowledge that getting started was difficult without some revolving fund type input. Although great emphasis has been placed on the delivery of an effective animal health service over the years, very few gains have been made. More than 340 Village Veterinary Workers (VWV's) have been trained in the province but less than 10% remain active. Cold chain facilities for which some vaccines are dependant continue to malfunction. Management and upkeep of refrigeration units by DAFEO staff is lax and is one of the many reasons why farmers have no confidence in animal health programmes.

Buffalo management

There are two main buffalo grazing areas. From June to November, families graze their animals on 'native pasture' on two fenced communal blocks of land – one of 10ha, the other 5ha. Both are close by on the NW side of the village, between 5 and 30 minutes walk from the farmers' homes. Depending on work commitments, ♀, ♂ and sometimes children tend the animals, returning them nightly to be confined either under their houses or storage barns. There are times during this wet period when animals are tethered within the village to clean up any excess native grasses. Although animals remain in good condition, increasing herd numbers coupled

with the need to enlarge the cash crop area is putting pressure on the grazing system. The June/July period can also be the time of greatest feed deficit as paddy is no longer available and native pasture growth slow at the start of the wet season. To help ease this situation, a number of farmers have established improved pastures but have yet to utilize this asset.

From December to May, buffalo graze on paddy stubble. They are joined by both cattle and buffalo from three neighboring villages and together have a stubble area of over 200ha to mob graze upon. Although they lose around 10% of their bodyweight during this period, farmers are not overly concerned as the benefits of having the stubble cleared outweigh the losses in bodyweight. They quickly regain condition during the wet season. At calving time, or when animals show signs of ill-thrift, they receive extra feeding in the form of cut and carry native grasses and leaves for a period of between 4 to 7 days. At no other time do they receive any supplementary feeding. Drinking water from rivers and streams is available at all times of the year.

When grazing together, animals interact as one herd, both male and female of all age groups. Bulls are not castrated, farmers prefer to leave them entire as they believe the muscling characteristics are not present in steers therefore resulting in a lower sale price. Mating is opportune, farmers unaware as to which bull provides the service. They are not concerned with inbreeding issues as mating takes place in the paddy area when grazing together with neighboring animals, thus broadening the gene pool. The 'biggest and strongest' bulls dominate the herd.

Cows give birth to their first calf at 4 years of age usually from late November through to January and produce a calf every year (?) until culled from the herd. The bulk of calving takes place in the paddy area. There are no problems at calving time, with cows never requiring assistance.

Although there are obvious animal health threats associated with the integrated grazing system the villages practices, no buffalo have died this year. However, this has not been the case in past years when 'some' adult animals have died from disease indicating Haemorrhagic Septicaemia. Deaths have usually occurred during the June/July and Dec/Jan period and dead animals are quickly eaten. Some 1yr and 2yr animals show signs of 'bloat' but this is never fatal. Calves begin to show signs of wasting and diarrhoea (toxacara), beginning early March but no treatment is provided even though a number of animals die. Vaccination campaigns have been organized but this has not been consistent not successful as animals have still died post treatment. The DAFEO staff do not actively promote vaccinations, they leave it to the VVW to organize the village and then inform them of what quantity of vaccine is required. There is now no resident VVW in Xaysavanh so now district staff being called upon to deliver and administer to animals. On saying this, the competence of DAFEO and their management of vaccines and other animal health remedies is weak. Farmers have lost confidence in them and now seldom inform them of sick and dying animals. They say they would prefer to treat their animals themselves but lack both the skills and access to vaccines/medicines to do so. There have been no recorded losses due to theft, wild animals, misadventure etc over the past 5 years except for one death occurring after a buffalo was hit by a car.

Markets are healthy, many local traders acting as middle men making regular inquiries for all classes of livestock. Bulls are usually sold when 5 to 6 years of age at unknown weights for 15,000 to 16,000 baht/head and cows at the end of their productive life. There are also times when animals are sold at lesser weights because of extraordinary circumstances e.g. hospital or education expenses. Animals are often sold cross border into Thailand.

Pig management

The local Mulaht is the pig breed of choice. Some farmers are breeding and fattening, others just fattening. While farmers say all sows are penned with rudimentary shelter and males and fattening animals housed, a number of pigs continue to roam free within the village. The pens and housing that is provided offers very little in the way of shelter and protection, are poorly sited and badly constructed. Flooring in the confined housing areas is in many cases dangerous

with numerous accidents reported. Hygiene is lax, earthen floor areas are never cleaned while wooden floors receive a wash down maybe once a week. Manure is sometimes collected and spread around vegetable garden areas. Feeding troughs are too small and unstable and there is feed wastage - smaller pigs struggle to compete with their larger peers.

Pig feeding and management inputs are provided primarily by the womenfolk. It takes on average 2 hours/day to collect and prepare rations. Feeding takes place each morning and night with lactating sows sometimes receiving an additional feeding at midday. All animals are fed the same ration, farmers are unsure of the quantities – 'big pigs get more than small pigs' and sows with piglets are fed to full. There is no 'creep' feeding of piglets and they are dominated by the sow at feeding times. Water is provided only with the feed morning and night.

Animals struggle to gain condition from March through to July. Rice bran and born are the two constants in the feed ration although some farmers have a deficit of rice bran from August through to October and they need to purchase. Stylo has been planted for the first time this year and this should help address the lack of protein in the diet. The seasonal feed calendar shows:

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rice bran	x	x	x	x	x	x	x	xb	xb	xb	x	x
Born	x	x	x	x	x	x	x	s	s	s	x	x
Stylo								x	x			
Airplane weed	x	x				x	x	x	x	x	x	x
Maize	x								x	x	x	x
Porsa									x	x	x	
Papaya		s	s									
Cass root	x	x										x
Spine vegie	x	x	x									x
Pumpkin												x
Water												

xb = have to purchase

s = dependent on availability

Breeding sows first give birth after they reach 1yr of age and farmers say they produce 3 litters every 2 years. This is debatable! They give birth in an earthen floor pen with rudimentary shelter to on average 6 – 7 piglets. Farrowing is trouble free but on occasion one piglet is lost through smothering. Male piglets are castrated by the farmers themselves at around 7 days of age. Piglets are weaned at 5 – 6 months of age and sows can become very thin during this lactation period.

The biggest piglet with the strongest constitution is often retained for breeding. Boars are sourced from neighbours and mating takes place in the sow's pen. Payment for this service is usually in the form of one piglet per farrowing.

Disease comes every June/July/August and every year pigs die – this year more than 40. In most cases the pigs become sick, skin lesions appear and they quickly die (CSF). There is no vaccination programme but district staff sometimes administer medicines of unknown type and for unknown reasons. Normally, farmers no longer bother to inform the authorities of animal death as they know that no action will be taken. The carcasses of dead animals are disposed of as quickly as possible, either by burying them or throwing them into the river. This is considered an acceptable means of disposal as farmers often see carcasses from neighboring up-river villages floating by.

Piglets often suffer from diarrhoea at 2 to 3 months of age but no action is taken. Pigs have never been de-wormed. Farmers blame a lot of ill thrift problems on mosquitoes, they have no knowledge as to why, where and how disease and sickness is spread. Other than the deaths caused through 'disease', there are no reported loses due to accident, theft, eating toxic feed etc.

It takes more than 1 year for a fattening pig to reach a marketable weight of 60kg. These are sold for 2,500 baht/head. There are no problems with markets, local traders calling in regularly. Often pigs are slaughtered at a younger age and weight for local festivals and ceremonies.

Poultry management

Almost all families have varying numbers of poultry. Managing these birds is the responsibility of the women and children and they provide a food source and ready cash for low cost household necessities. They scavenge during the day, sometimes fed broken rice and rice bran when available. At night time they are caged, primarily to protect them from predators.

Every year, often twice a year, birds of all ages die. Sometimes sick birds show nervous signs and symptoms of green diarrhoea and nasal discharge (ND). Other times birds become lame, their neck swells and heads become black (FC). It is not uncommon for every bird in the village to die. Farmers appear to live with this, they do not vaccinate nor do they supply any health inputs. Introduced birds immediately join with the flock, there is no quarantine period. Inclement weather, predators and generally lax management practices also contribute to illness and death.

Options for early interventions

Buffalo

- Worm control in buffalo calves to reduce mortalities associated with Toxacara infestation
- An effective preventative HS vaccination programme (cluster group).
- Improved feeding systems, especially in the dry season and June/July period, with strategically sited forage plots.

Pigs

- Improved housing/hygiene
- Improved feeding/water supply with a more balanced diet (stylo as a protein source already established)
- De-worming
- Preventive disease control strategies including animal movement control and quarantining

Phonethong Village,

Vieng Phoukha District, Luang Namtha Province

17/09/2006

Introduction

Vieng Phoukha District is situated in the south western part of Luang Namtha Province. Phonethong Village is situated 14kms south of the Vieng Phoukha district centre and straddles the soon to be completed main Luang Namtha – Houei Xai highway. This finished road will improve market access and linkages between Bokeo and Luang Namtha Provinces as well as to Thailand and China. The Phonethong Khmu community emigrated from their remote mountain village in 1980 to be closer to the benefits that the road provides. Present population is 473 (264♀) made up of 96 families living in 80 households.

The village has access to 35ha of paddy, 25ha of upland cultivation area and 5ha of other cash crop area. Crops include both paddy and upland rice, maize, cassava (under contract to Chinese merchants), peanuts and NTFPs. There is also a 50ha block designated as the livestock area where the village cattle and goats graze and browse. Traditionally, livestock have played an important role in providing status and family well-being, education and health needs, security and cash accumulation, for festivals and ceremonies and money for household necessities. Distance from the designated livestock area, disease history and the high cost of replacement animals, shortage of labour and quality feed are the main reasons given for low stocking numbers. Another reason is the damage these animals are doing to the unprotected cash crops - this has now become a contentious issue within the village. A number of farmers have newly established improved forage plots within easy walking distance and will evaluate these before committing themselves to increasing the forage area and animal numbers.

A recent village PD conducted by the CBSLSP Project identified lack of feed, disease and the remoteness of grazing land as major constraints to livestock production and pests and animal encroachment as impediments to crop production.

Buffalo/cattle management

The five mixed age/sex cattle free range graze year round on native vegetation with some of the goats and pigs on a 50ha upland block. As this piece of land is more than 2 hours walk on the western side of the village, elderly family members (♀, ♂) take turns in living with them. Although stocking density is light and animals maintain condition during the wet season, farmers complain that they are never 'fat'. A high number of external parasites are often present, especially in August and September, and these ticks and lice, along with mosquitoes and leeches, are considered by the farmers to be the cause of the ill thrift. The more obvious insects are picked off at night when the animals return for salt and shelter, other than this no treatment is provided, nor any other animal health inputs. Rudimentary housing has been built where the cattle sleep at night and shelter during inclement weather.

There is no supplementary feeding at any time. Animals have access to reliable drinking water from streams. Cows calve any time between December and March with no calving problems. First calving is at 3 – 4 years of age depending on size and they continue to produce one calf a year until they are culled (10 – 12yr old). Mating is not planned, the bull runs with the cows all year round. Bull calves are not castrated as this practice is perceived to deter growth rate.

The 20 buffalo rotate in a mixed sex/age group around the lowland paddy and village area. The 4 paddy areas, three 10ha in size and one 5ha, are between 10 and 30 minutes walking distance from the village. Buffalo are tethered away from the paddy during the rice growing season and have access to local grasses and vegetation, other times they roam freely cleaning up stubble areas. They are sometimes supervised by children, sometimes not. This has become a contentious issue, animals are causing damage to crops. Although local legislation demands that owners of livestock be more responsible in the management of their animals, farmers are not complying. They allude to shortage of time, labor, resources and feed as the reason.

Buffalo cows produce their first calf at 4 to 5 years of age any time between December and March. They mate in the paddy area and continue to produce one calf a year until they are sold as 12 year olds. No supplementary feeding is provided and calving is trouble free. The feed pinch period is February to May and animals lose condition during this time.

In 2001, twenty buffalo died at the onset of the seasonal rains. This is the only time that major losses have occurred but occasionally the odd adult animal has died for reasons unknown. Losses in young animals under one year of age occur 'sometimes', but not every year. Dead animals are buried. The DAFEO are not informed when animals die but the symptoms described indicate HS in adults and toxocara in younger stock. There is a resident Lao-EU trained VVW and a vaccination campaign was organized after the 2001 outbreak. Unfortunately this has not continued as vaccines have not been available when farmers have requested them and the VVW appears to have lost interest. Farmers indicate that they would be prepared to vaccinate but have given up on the DAFEO as a source of supply. The DAFEO say they rely on the VVW to arrange a campaign amongst the villages and wait for him to inform them of what quantity is required. This situation could be partly rectified now that the EU Micro Project has installed a more reliable generator operated refrigeration unit but the problems with the delivery of an effective animal health service remain. Of the 36 VVW's trained in the district only 5 are now considered to be 'active'. No other animal health remedies are provided to animals, no stock have been lost or injured through other reasons including misadventure. On occasions, when animals have been vaccinated, abscesses have formed at the vaccination site.

Local traders call by regularly every week if road conditions permit. Almost always they have trucks laden with animals of all types. There have been no recent sales, the last buffalo bull sold for Kip 4,000,000, weight unknown.

Pig management

There are 150 predominantly mulaht pigs in the village and almost 40% of families own one or two animals, mostly fattening. Although a small number are housed in reasonably well constructed slatted floored houses, most are roaming free or penned in very unhygienic conditions. Some sows are free ranging in the upland livestock area with the cattle and goats and are looked after by the elderly couple. The women folk are responsible for their care and they spend up to 3 hours/day sourcing, preparing (cooking) and providing food and looking after them (1 hr spent feeding and caring for the upland pigs). The housed pig pens are cleaned whenever 'the farmers have time', the manure spread around fruit trees and on vegetable crops. Earthen floored pens receive no cleaning.

Feeding occurs twice a day, morning and night. Small pigs receive 1 – 2 'big' bowls of feed a day, larger pigs get 3 – 4. Animals of different size and sex receive the same ration as do gestating and lactating sows. The quality is the same but the quantity differs. Animals are not penned according to sex or size and small pigs struggle to compete against their bigger peers. Food is mixed with a small amount of water and this is the only daily water that the penned pig has access to. Almost all feeding troughs are of inappropriate size and shape and there is evidence of spillage and wastage.

Farmers are happy with the condition of their animals throughout the year although sows get very thin during lactation. There is a shortage of quality feed from March through to June. A number of farmers have this year grown stylo for the first time and have just recently started to include this in the diet.

The feed resources available during the year are:

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rice Bran	x	x	x	x	x	x	x	x	x	x	x	x
Banana stem	x	x	x	x	x	x	x	x	x	x	x	x
Born	x	x	x	x				x	x	x	x	x
Maize								x	x	x	x	x
Airplane weed							x	x	x	x	x	x
Pumpkin/papaya										x	x	x
Porsa	x	x				x	x	x	x	x	x	x
Spine vegetable								x	x	x	x	
Cassava root & leaf	x	x	x	x							x	x
Sweet potato leaf								x	x	x	x	x
Stylo									x			
Water												

The sow is 2 years of age before she produces her first litter. She produces 2 litters – one each year – and then she is sold. She gives birth to between 8 and 10 (?) piglets and weans seven at any time between 4 to 8 weeks of age or when they wean themselves. Piglet deaths are mainly due to the sow not milking sufficiently and the poor conditioned lactating sows observed reflect this. Boars are sourced from neighbours and it's usually a case of 'anything goes' as uncastrated males are not in plentiful supply (farmers themselves castrate their male piglets at 3 weeks of age). If the choice of boar selection is on offer, farmers will choose one of good constitution and in obvious good health.

Hardly a year passes without an outbreak of CSF. Again there is no preventative animal health strategy, farmers complaining of the lack of vaccines and district staff saying they continue to wait for the VVW's report. Deaths occur mainly at the onset of the wet season but animals die throughout the year. The DAFE0 is seldom informed and dead animals are quickly buried. Other than CSF, pigs have died because of 'skin disease' and shortly after blood has been observed in the faeces. Pigs often have diarrhoea but no animal health remedies are provided. Pigs for fattening are often purchased from neighbouring villages, from markets and traders. These are never quarantined before being exposed to local animals and it has been observed

that pigs have become unwell and died shortly after the introduction of new stock. Besides disease, deaths and losses have occurred through road accidents and theft.

Local traders, acting as middle men, call by regularly. Pigs are sold weight unknown (3 hands) depending on personal need and farmers receive between Kip 400,000 and 500,000. It usually takes more than one year, not uncommon for two, to fatten a pig for sale.

Goat management

There are 25 goats in the village and the deputy head owns 17 of them. They are managed together, mixed age/sex, in the upland area all year round and looked after by the elderly carers who live on site with them. Animals are always in good condition (?), during the day they browse local vegetation and return to camp each evening at 1630 hrs when salt is on offer. At 1800 hrs they are housed in a dirt floor dwelling. At birthing and when there are signs of ill thrift, goats remain tethered in the barn and grasses and tree leaves cut and provided. Water is always available.

Nannies first produce a kid (kids) at one year of age. There is no planned kidding, does giving birth throughout the year 3 times every 2 years. Multiple births are not uncommon. Birthing is trouble free but if triplets are born the smaller weakest of the three usually dies. It is a closed flock (no outside blood) and the buck that provides the mating service is unknown, no males are castrated.

There have been no losses through disease but animals, especially the young, often suffer from diarrhoea at non specific times throughout the year. Pink eye is also evident in June and July. Human health remedies are provided to address these two problems. The goats also suffer from the same external parasite problems that the cattle have and are often seen biting their coats and rubbing on trees. No treatment is provided but insects that can be seen are picked off. Sick animals are removed and given preferential feeding. Losses have occurred through theft, hunters and misadventure – on one occasion a tree fell on the barn killing one animal.

Both male and female goats have been sold weight unknown (3 hands) for between Kip 200,000 and 270,000. The majority of goats slaughtered are for village ceremonial occasions, weddings, festivals etc.

Poultry management

Almost all families own the local breed of chicken and every year birds die – this year more than 150, last year 200. In the past birds were vaccinated against ND and FC but even these treated birds succumbed so villagers are no longer interested in vaccinations. Those that are can not source vaccines and complain that the VVW is no longer interested. Some have tried antibiotics and traditional medicines e.g. lemon grass with little or no effect. Losses also occur through theft and predators and many die through road accidents. Birds are often bought and sold with no quarantining practiced.

The women folk and children are responsible for looking after the birds. They free scavenge throughout the village during the day and are penned each night. They are fed rice bran, broken rice and maize.

Options for early interventions

Cattle/Buffalo

- Internal/external parasite control including toxocara treatment
- An effective preventative HS vaccination programme.
- Improved feeding systems, especially in the dry season and calving times

Pigs

- Improved housing/hygiene/feeding troughs
- Improved feeding/water supply with a more balanced diet.
- De-worming
- Preventive disease control strategies including animal movement control and quarantining

- Mating/boar practices

Goats

- Housing
- Parasite control
- Castration
- Mating

Donxai Village, Phonexay District, Luang Prabang Province

Introduction

Donxai Village is situated 10kms East of Phonexay District centre and 85kms NE of Luang Prabang city. It is serviced by a 4 yr old unpaved road that continues on for another 45kms, ending in Phonthong village. Access to Donxai in the wet season is difficult as road conditions deteriorate quickly and rivers in flood are often impassable. The 1st Khmu community settled here in 1973 and in 2002 were joined by a neighbouring Khmu village who moved here after the road was formed. The present population is 461 (243♀), and is made up of 56 HHs. There are 60♂ and 87♀ of working age.

Shifting cultivation in the uplands is the main agriculture activity. There is now no paddy area, the small 0.6ha plot that was once privately owned has now been sold to a neighbouring village. This year 78ha of upland rice has been planted along with almost 100ha of other crop including jobs tear, maize and cassava. Although crop production is considered to be the priority activity, livestock production is considered essential to their physical and emotional well-being. Ten families own 63 head of mixed age/sex buffalo - raised for sale and asset accumulation, not for draft - 9 families have 83 goats and almost all families own pigs (160 in total) and poultry (638). The sale of these animals provides money for buildings, renovations, household necessities and for health and education needs. A small number small pigs and chickens are slaughtered for home consumption.

A recent village PD conducted by the CBSLSP Project identified the death of animals and lack of feed as the two major constraints to animal production (refer PD).

Buffalo management

There are two buffalo grazing areas. Eight families graze their animals on a 100ha block 1 hrs walk to the west of the village, 2 families access a 20ha block 30 minutes walk on the eastern side. Farmers say the area is fenced on 3 sides and the Namba river providing the forth barrier and the supply of all year round drinking water. However, the DEWs dispute the area size and the fencing claim. There is a large spring in the centre of the larger block providing a wallow area for the animals.

Family members, both female and male, and sometimes children, camp permanently with the animals, rotating responsibilities every 4 – 5 days. The buffalo free range graze local scrub and grasses for 12 months of the year, they have never received any preferential feeding other than a daily salt ration, nor have they been tethered, housed or restrained in any manner. Farmers observe that their animals are in 'fat' condition from June until January, but lose condition and become 'thin' during the February – May period. Five families have recently planted small areas of improved grasses and legumes 3 – 5 minutes walk from the village but have not as yet been in a position to utilize them. However, there has also been a large forage nursery area established and over the past 10 days one farmer has been accessing this resource to 'cut and carry' to 3 buffalo tethered close by.

Animals run together as one herd, both male and female of all age groups. Bulls are not castrated, farmers prefer to leave them entire. Cows give birth to their first calf at 4 years of age (this is debatable, 5 farmers argued that they were 4 year old at first mating) and produce a calf

every year until culled from the herd as 12 yr olds. Because calving takes place over an extended period (August – February) it is quite probable that they produce 2 calves every 3 years. There are no problems at calving time, with cows never requiring assistance.

Mating is opportune but farmers are adamant they know the sire of each calf. The 'biggest and strongest' bull dominates the herd. On saying this, they admit to observing brothers mating with sisters, sons mating with mothers. On a few occasions in the past, if a village bull is not available, farmers will take their cows to a neighbouring village for mating.

Every year, between June and August, 1 – 3 adult animals die, symptoms indicate Haemorrhagic Septicaemia (HS). Carcasses are never burnt or buried, all animals that die are quickly eaten. Treatment is curative rather than preventative. After the first animal dies, farmers inform the DEWs and a vaccination campaign is organized. Farmers administer the treatment themselves, 3 villagers have been trained as Village Veterinary Workers (VWV's) under the old Lao-EU Livestock programme. Calves begin to show signs of wasting and diarrhoea (toxocara?) at age 6 weeks onwards. It is not uncommon for more than 50% of calves to die or get sick and never fully recover. There is no treatment provided as farmers do not know what to do. There have been no deaths or losses due to theft, accidents, animal attacks, hunters mis-adventure etc but animals do sometimes stray and cannot be found. There is no animal registration, animal movement control or quarantine but farmers say they quickly learn of disease outbreaks in neighbouring villages and ensure that no outside animals come in contact with their herd.

Traders from Luang Prabang visit the village 3 – 4 times every month while the local 'middle man' visits more regularly. On almost all occasions they arrive with purchased animals from other villages in the back of the truck. Normally, farmers will sell male animals at 4 yrs of age onwards and cows at the end of their productive life, but there is no age/weight criteria. Farmers will sell as the need arises. They are not aware of the local per kilo meat price and sell on a per head basis, K4,500,000 being the 'magic' figure.

Goat management

The 83 goats browse in the 100ha buffalo block. They are shepherded by the same farmers who tend the larger animals and enjoy daily free range of the area, browsing native vegetation. For 8mths of the year they are 'fat' but lose condition from June through to September. They receive no additives or supplements and no preferential feeding at any time. There is no tethering or restraining. Each family has a crudely constructed goat house and the animals return to camp at night where they receive a salt ration. They have ready access to drinking water.

Bucks, nannies and kids of all age groups run together. No males are castrated but farmers would like to learn how to do this practice. Mating is random and opportune, farmers are aware that inbreeding occurs. There is no planned kidding period, kids are born in all months throughout the year. Nannies give birth at 6mths (??) of age onwards. Twin births outnumber single births. There are no kidding problems.

Goat farming is a relatively new practice in the village and to date there have been no serious death threatening disease. On saying this, diarrhoea is common in all age groups during the July-August period and animals become thin. Scabby mouth is also a problem during this period. Purchased animals go directly into the flock, there is no quarantining. Animals have never been treated with any vaccines, medicines or anthelmintics.

As with the buffalo, traders come regularly. All females are retained in order to increase flock numbers, males sold according to need. Farmers receive K14,000/kg liveweight.

Pig management

There are 2 pig production areas – 125 animals managed within the village proper and 25 in the uplands with the buffalo and goats. The reason for this split is the hope that the upland pigs will be less susceptible to disease outbreaks. This unfortunately is not the case.

Management is similar in both areas. In the uplands, approx. half the animals are scavenging

freely, the remainder penned in crude earthen floor structures. Farmers say all pigs in the village are penned, often under storage houses, but many pigs can be seen roaming freely around. The village walk highlighted some serious problems. Almost all animals are thin, pot-bellied and malnourished, the penned animals suffering more than those freely scavenging. The pens provide very little shelter and protection, are poorly sited and badly constructed with inadequate ventilation. There are no hygiene or manure management procedures. Feeding troughs are too small and unstable and there is feed wastage. One pen has a raised slatted floor made of bamboo. This is not secured and the rolling poles are forcing and trapping the animals legs down into the effluent below. This effluent is oozing up between the slats. One pig of more than 1yr of age and weighing less than 20kg, is so badly infected with mange its torso has been rubbed raw. The owner, a trained VVW, has recently treated it with pen-strep!

The breed is the local Mulaht. Some farmers are breeding and fattening, others just fattening. Both ♀ and ♂ claim shared responsibility of caring for the animals but in the main it is the ♀'s work. It takes about 2 hrs each day to collect and prepare the feed. Animals are fed morning and night, sometimes mid-day as well. All animals are fed the same ration, farmers are unsure of the quantities – 'big pigs get more than small pigs'. Water is provided with the feed morning and night. Rice bran is the only constant feed provided, being fed 12mths of the year. Some farmers have a deficit of rice bran from June through to November and at this time they purchase, payment either in cash or in labour. Animals are best conditioned in the Late July – November period when maize is readily available.

The seasonal feed calendar highlights serious deficiencies in the diet.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rice bran	x	x	x	x	x	x	x	x	x	x	x	x
Maize							x	x	x	x	x	
Posaa					x	x	x	x				
Born					x	x						
Cassava Root	x	x	x	x	x	x	x					
Ban. stem					x	x						

Breeding sows first give birth at 1yr of age and produce just the one litter each year. They produce 7-8 piglets but wean only 3-4. Reasons for the high mortality include: sows producing insufficient milk; death by smothering and cold weather conditions. There are no set or planned weaning times, in most instances the piglets wean themselves. Male piglets are castrated by the farmers themselves at 7 days of age. The runt of the litter is sometimes left entire as farmers fear the operation may kill them. Sows are released from their pens to mate with free roaming boars. This can often be a time consuming exercise as boars are not always readily available. It is possible that the uncastrated runt provides the service. Boars, as well as pigs for fattening, are often purchased from neighbouring villages as sires. The loose selection criteria is: length and depth of body, strong legs and a healthy looking constitution. These animals are immediately introduced into the herd.

Disease comes every April and May and every year between 50 and 60 pigs die. It is non selective, both young and old, male and female succumb. In most cases the pigs become sick, skin lesions appear and they quickly die (CSF). There is no vaccination programme, farmers inform the district of the outbreak but no action is taken. Pigs have never been de-wormed, nor do they receive any other animal health inputs. The 3 VVW's are inactive, the only animals they treat are their own and obviously often mis-diagnosing the problems. The carcasses of dead animals are eaten as quickly as possible. Farmers say they worry what effect eating this meat will have on their children, some comparing the practice with tripping over a 'bombi'. Intestinal worms and cysts in the muscle are also noted when preparing food; these parts are cut out and thrown away.

Other than the problems experienced post parturition - pre weaning, there are no reported

deaths or losses through accident, theft, eating toxic feed etc.

It takes more than 1 year for a fattening pig to reach a marketable weight of 40kg. Local price is K9,000/kg liveweight, and farmers on average receive K300,000/head.

Poultry management

All families have varying numbers of poultry, village total being 638. Two weeks ago, World Vision distributed 130 1wk old ND vaccinated exotic yellow chickens between 10 families. Managing these birds is the responsibility of the women and children and provide a food source and ready cash for low cost household necessities. They scavenge during the day, sometimes fed broken rice and rice bran when available. At night time they are caged, primarily to protect them from predators.

Every year, often twice a year, birds of all ages die. Sometimes sick birds show nervous signs and symptoms of green diarrhoea and nasal discharge (ND). Other times birds become lame, their neck swells and heads become black (FC). It is not uncommon for every bird in the village to die. Farmers appear to live with this, they do not vaccinate nor do they supply any health inputs. Introduced birds immediately join with the flock, there is no quarantine period. Inclement weather, predators and generally lax management practices also contribute to illness and death.

Options for early interventions

Buffalo

- Worm control in buffalo calves to reduce mortalities associated with Toxocara infestation
- An effective preventative HS vaccination programme
- Improved feeding systems, especially in the dry season, with cut and carry forage
- Segregation of bulls from the breeding herd to minimize out of season conceptions

Goats

- Parasite control, especially in susceptible young
- Improved housing
- Improved feeding with cut and carry forages, especially during the June–September period when animals are at their weakest

Pigs

- Improved housing
- Improved feeding/water supply with a more balanced diet (stylo as a protein source already established)
- De-worming
- Preventive disease control strategies including animal movement control and quarantining
- Improved boar/sow management

Nalun Village Khoun District, Xieng Khouang Province 23/08/2006

Introduction

Nalun Village is situated in a narrow valley 27kms south of Khoun District centre, Xieng Khouang province and approx. 55kms south of Phonsavan city. It straddles an unpaved road that continues on to Bolikhamxai and Xaisomboune Provinces. The Hmong community settled here in 2002 after moving down from the uplands.

The community is struggling adjusting to their new environment. They feel that the recent district and village legislation is impeding livestock development and reflect that animals enjoyed greater growth rates and survival when raised in the uplands. Paddy cultivation is also a new concept and they feel they lack the necessary skills to maximize production in this area.

Shifting cultivation in the uplands has been and still remains a major agriculture activity but increasing time is now spent working the 13.6ha paddy area. This year 3ha of upland rice has also been planted along with 14ha of cassava, 1.3ha maize and 2.5ha of other cash crops and forages. Livestock rearing is extremely important to the village both for cultural reasons and as the main source of cash income. Farmers say there are no other options available to them to generate income. The sale of animals provides money for household necessities but more importantly for health and education needs. Just as important are the large number slaughtered for home consumption, especially at times of spiritual/cultural festivities, weddings, deaths etc. Buffalo are used for draft purposes in preparing the paddy.

Forty seven families raise 135 head of cattle, 76 buffalo and 4 horses, seven families have 35 goats, over half the village raise pigs, but because of disease and dissatisfaction in pig production only 25 pigs are currently in the village. Almost every family own some form of poultry - 725 in total.

A recent village PD conducted by the CBSLSP Project identified the death of animals, the lack of feed and lack of access to new information and technologies as the three major constraints to animal production (refer PD).

Cattle/buffalo management

The village has considerable experience in raising large ruminants. A number of farmers raise fighting bulls, magnificent animals fed on a high energy diet of cassava root and grasses. These >5 yr old animals are selected from the herd on conformation and penned close to the house and preferentially fed and treated. Elders recall these animals being of much greater size (especially in body length) and weight in past years and blame poor nutrition as the reason for this. As no outside blood has been introduced for as long as farmers could remember, inbreeding will also be a factor in the decrease in size.

Farmers have formed themselves into three cattle/buffalo groups and from June to December the 200 plus animals free range in the designated upland grazing area. District regulation has identified specific areas allocated to livestock and crop production and this upland area has been assigned to the free grazing of livestock. The three areas are between 1 and 1 ½ hours walk in the mountains on the east and west side of the village and total just over 200 ha. The menfolk are responsible for the animals care, they rotate responsibilities and check on them 'whenever they have time', usually two to three times a week. There is nobody living permanently with them and there is no shelter provided. Whenever possible, farmers will bring salt with them on their visits.

During this June – December period there are no management or health inputs and the cattle and buffalo roam and graze 'natural grasses' without any constraints/restraints or supplementary feeding. There is ample clean drinking water and areas for wallow.

Animals graze together as a mixed sex/age/breed herd, there is no segregation. No bulls are castrated as farmers believe this practice is detrimental to growth rate and muscling, especially in the neck and front quarters. The herd structure is weighed heavily in favour of older animals, almost 70% are three years of age and above.

Animals are in lighter condition when they are driven to the upland grazing area but they quickly regain weight. However, by December feed quality and quantity is declining and they again begin to lose condition. This is particularly so with younger stock as they struggle to compete with the older animals.

In January the animals are returned to graze the lowland areas, rotating around the paddy crop stubble and local vegetation areas adjacent to the village. The grazing areas are unfenced, the animals are neither tethered nor housed. For the first three months they regain condition then again begin to lose it. Farmers have appeared to accept this as part of the cycle but are becoming increasingly concerned now that herd numbers are increasing and available grazing area decreasing. This is particularly so with the buffalo males as they need to be well conditioned for paddy draft work. To date no supplementary feeding has been provided at this stage but this year four farmers have established small areas of forage to help address the feed deficits.

Calving and mating take place in the lowland area, cows begin calving shortly after returning from the uplands. Farmers will spend up to one hour a day checking their animals during this time to ensure that cow and calf are healthy and strong. They report no calving problems and provide no inputs and no additional feeding at this time.

Cows first mate at three years of age, buffalo at four years, and farmers say they produce a calf every year until they are culled at 10 – 12 years. However, herd structure does not support this claim. Mating is an uncontrolled opportune activity, the 'older, stronger' bulls dominating. Farmers are not concerned with inbreeding issues.

There has been no Village Veterinary Worker (VWW) trained in the village, farmers themselves administer to their animals. Disease is an issue and animals die each year, usually in the Jan/Feb and June/July period. Farmers are a little unsure of what their animals die of but say FMD is the cause. Symptoms indicate HS. Some farmers have vaccinated for HS in the past but their animals have still died so there is little trust and acceptance of preventative vaccination campaigns. Farmers will often treat their animals, especially young calves that show signs of ill-thrift, with traditional medicines. What these treatments are is a little unclear but farmers report good success rates. Ticks and lice are also successfully controlled by the application of local remedies. The only licensed medication provided is for the control of toxacara in young buffalo calves. There have been no losses due to misadventure or accidents but theft is a growing problem as more and more families are struggling to make ends meet.

Cattle and buffalo bulls are sold at 6 years of age or when extraordinary circumstances arise when there is an urgent need for cash. Cows are kept until 10 - 12 years old or earlier if infertile or displaying undesirable traits.

Both domestic and export markets are strong, traders stopping by 3 or 4 times a week inquiring as to the availability of all types of livestock. Farmers receive Kip 24,000/kg.

Pig management

There are now only 25 pigs in the village. Whereas in the past there were many pigs that roamed freely within and around the village, new legislation is enforcing penned or housed animals. Farmers have complied but production and growth rates have rapidly declined. There has also been a sharp increase in theft and missing animals. Most villagers would prefer to rear their pigs in the upland but managing them in this far away area is difficult. Pig rearing is an important activity and they are desperately seeking assistance on how to manage their animals in a controlled environment.

Some families are breeding and fattening but there are times when others will buy in young animals to fatten when disease is considered less a risk. The breed of choice is the large Mu Lao Suang but the Mulaht is often purchased as a fattening option if no better suited animals are available. The pigs presently managed are all enclosed in pens with a small roughly built thatched roof, earthen floor, open sided shelter provided. In the cold season, straw bedding is provided. The womenfolk look after the animals and it takes on average two hours a day to source, prepare and feed the pigs. Animals are fed morning and night with the same rations, small pigs competing with larger pigs eating from poorly constructed feeding troughs. Wastage is high and the only water available is that which is given with the feed.

It takes one year to fatten a pig to 50kg. There is a lack of protein in the diet and the seasonal pig feed calendar highlights serious deficiencies. It is energy rich, high in fibre and badly lacking in protein – the main reason why it is taking so long to fatten young stock.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rice bran	x	x	x	x	x	x	x	x				x
Maize	x	x	x							x	x	x
Airplane weed				x	x	x	x	x	x	x	x	
Born						x	x	x	x	x	x	x
Cassava root	x	x	x	x	x	x	x	x	x	x	x	x
Banana stem	x	x	x	x	x	x	x	x	x	x	x	x

Sows produce one litter a year or two every three years. On average 5 – 7 piglets are born and 3 – 5 are weaned. Piglets are lost through smothering at birth, cold weather and theft. There is no planned weaning, piglets wean themselves. Farmers will flaunt village law and release the sow in the hope that she will mate with whatever boar is available. Male piglets are castrated at 3 days of age by the farmers themselves.

Pigs of all ages die every year, usually in June and in again in December. All the symptoms indicate Classical Swine Fever (CSF). Dead animals are quickly eaten. There is no vaccination campaign and the village keeps quiet about the deaths, the do not inform the district livestock staff. Any purchased animals are introduced into the herd with no quarantining, farmers having checked on the health status prior to purchase. There is also no de-worming. Farmers have observed large numbers of worms in the offal at slaughtering time and cysts in the meat have also been observed. These are always 'carefully' removed before cooking. Mange is also observed but no treatment is provided. There have been no recent sales, animals are being kept for local consumption and New Year festivities.

Goat management

The 35 goats browse on native vegetation in and around the village. Adult animals wear a neck brace to keep them from intruding into gardens and protected areas. For 10mths of the year they are 'fat' but lose condition at the end of the dry season. They receive no additives or supplements and no preferential feeding or treatment at any time. There is no tethering or restraining. Two families have a crudely constructed goat house but the animals are seldom returned to it. They have ready access to drinking water and salt is provided.

Bucks, nannies and kids of all age groups run together. Males are castrated at a young age by the farmers themselves, the biggest and strongest billy remaining entire to be used for breeding. Mating is random and opportune and there is no planned kidding period, kids are born in all months throughout the year. Nannies give birth at 6mths (??) of age onwards. Twin births outnumber single births. There are no kidding problems.

To date there has been no serious death threatening disease. On saying this, diarrhoea is common in all age groups throughout the year as is orf (scabby mouth). Animals have never been treated with any vaccines, medicines or anthelmintics other than traditional medication.

Options for early interventions

Buffalo/cattle

- An effective preventative HS vaccination programme.
- Management of cows and calves through feeding cows and weaning calves.
- Growing and improving animals being finished for sale.

Pigs

- Improved housing/hygiene/feed troughs
- Improved diets (protein)
- Sow and piglet management (the pig cycle)

- De-worming
- Disease awareness and preventive disease control strategies including animal movement control and quarantining

**SamPhanThong Village,
Vieng Thong District, Houaphan Province
20/08/2006**

Introduction

Sam Phan Thong village could be considered a 'suburb' of Vieng Thong township as it lies within easy walking distance of the district centre. The township is situated in a picturesque valley surrounded by protected mountain forest parks and reserves. Once road construction is completed the district will enjoy good access to not only the district capital Sam Neua, but also to Vietnam, Xieng Khouang and Luang Prabang Provinces.

The village, made up of 76 households, has a population of 428 (227♀). Sixty two families are Lao Loum and fourteen are Lao Suang (Hmong). The head of the village is a Lao Loum woman who is energetic, focused and committed to improving village livelihoods. Main activities are paddy production (12ha paddy) and upland cultivation but livestock are seen as the main source of cash for everyday living expenses. The paddy area lies close in on the north and south village boundaries.

Livestock is important as a means to escape the poverty trap, for cash accumulation, money for increasing health and education needs and for purchasing household necessities. More families are interested raising livestock but because animals continue to die, the lack of feed and capital required to get established, low skill levels and a climate they consider to be harsh, they have held back from investing. Presently nine families own 20 head of cattle and 25 buffalo, thirty own 71 pigs and almost all have poultry. The latest livestock data shows the presence of quite a large number of goats but these have recently been sold because of recurring 'feet' problems.

Cattle/buffalo management

The village have formed themselves into two cattle/buffalo groups and from late May until December the 45 head join with other village animals to free graze native grasses and shrubs in the designated upland areas. Group 1 comprises 3 villages with a total number of more than 100 head of mixed age/sex/breed animals. These graze a large block of land 12 kms to the south of the village. Group 2 merged with 100 animals from 4 neighbouring villages and graze in the upland 13 kms north of the village. Villagers were unsure as to the size of the grazing blocks but indicated that both were 'big'. The menfolk share responsibility in checking on the animals but because it takes more than 3 hours to walk to the grazing area, this is not done as often as farmers would like. Depending on work demands, they try and visit at least once a week. There is never a problem with identifying their own animals and if an issue of ownership does arise farmers can refer to the ear tag number for verification as all animals have been registered. There are no management inputs during this upland grazing period; animals free graze and are left to fend for themselves. There is no fencing and no shelter is provided.

There is grazing pressure during this time, farmers are concerned with both the quality and quantity of feed on offer. Because of increasing herd numbers, animals are not returning to the lowland in as good condition as they did in the past. Because of local regulation and the set-aside of land for reserves, there is no opportunity to expand this upland grazing area. A number of farmers have this year planted improved forages close in to the village and are excited about the possibilities this feed resource has to offer. After a period of experimentation and as farmers appreciate the benefits, they plan to increase the area, erect housing and hold selected stock e.g. cows and calves and finishing animals close to their fields.

Animals are returned in early January and graze on paddy stubble and grass areas around the village. Some areas are fenced but in the main animals are tethered. Farmers would like to increase the fencing to better control their animals but consider the cost of erection and maintenance prohibitive. Children are often given the responsibility of looking after the animals at this time. They return to the village each night to be tethered under houses or storage barns. Available feed quickly runs out and animals go through a further feed pinch period during February and March. No supplementary feeding is provided at any time of the year.

As soon as the animals return to the village, a vaccination campaign is organized. Although there is no active resident VVW in the village, the DAFEO have been very pro-active in this area over the past two years. The delivery of an effective animal health service is now the districts no.1 priority. The district staff make the arrangement with farmers, organize the vaccine and administer to the animals themselves. All animals are registered and vaccinated against HS, staff going from household to household with their bleeding pole. Farmers are happy to have this done but are not fully convinced as animals continue to die, especially during the June/July period when stock are in the uplands. Neighbouring village stock are also vaccinated but the DOs admit to not all families being willing to present their animals for treatment. Before taking their animals to the uplands, farmers inquire as to the wellbeing of the neighbouring stock. This is nothing but a token gesture as no animals are physically checked for health related problems.

An outbreak of FMD was recalled but nobody could remember when this occurred. The other major animal health issue that is not presently being addressed is the prevalence of parasites in calves, especially young buffalo calves. Farmers report that almost every year young animals die because of diarrhoea and wasting away.

Attacks from tigers occur regularly, this year 4 animals have been taken. Some years the odd animal strays and has never been found. Theft of animals is thought to occur but there is no proof to support this.

Cows first mate at 3 years of age, buffalo at 4 years. Farmers say they continue to produce a calf every year thereafter until they are culled at 8-10 yrs of age. This is debatable considering the management and condition of the animals. Calves are born trouble free in the uplands late November – December, mating takes place when the animals are grazing the paddy area. This is an opportune activity, farmers are not aware - nor are they concerned - as to which bull is servicing which cow. It is assumed the biggest and strongest is doing the job. There is no planned weaning process, calves weaning themselves over time. Bull calves are never castrated. Bulls, cows and young stock of all ages are managed together, no animal or class of animal is taken aside and given preferential treatment, calves are forced to compete with older animals.

Cows are usually culled and sold when they reach 8 years of age, buffalo at 8 – 10 years. Bulls are sold earlier depending on personal need but most cattle are sold at 4 - 5 years and buffalo at 6 -7 years. Traders acting as middle men for Sam Neua and Xieng Khouang interests call regularly and both cattle and buffalo realize Kip 24,000 kg.

Pig management

Pig production is an activity the village authorities wish to actively promote. They see this as the best opportunity to improve household incomes as establishment costs and associated risks are less than with large ruminants. However they recognize the lack of farmer livestock skills and have asked for assistance in addressing this problem.

There are 71 mixed age/sex mulaht and mulaosuang pigs penned within the village. The womenfolk and children are the ones responsible for their care and about 2 hours a day is spent on sourcing, preparing and cooking and feeding the animals. Some farmers have a breeding/fattening enterprise, others are interested only in fattening. Whatever the system, all are confined to comply with local regulation in the most basic of structures. The pens that were seen during the village walk consisted of a small fenced area with a crude open sided shelter in one corner. Some of these shelters had wooden floors but they were not raised and the build up

of dirt and dung rendered them in a state worse than if they had no flooring at all. Most pigs looked uncomfortable and stressed and the present environment is certainly not conducive to good animal production and well-being. The area is never cleaned. The feeding troughs are inappropriate and there is evidence of feed spillage and wastage.

Rice bran and born are available all year round, maize from August through to October, cassava root from December to February. Household waste and some vegetables are provided when available. The diet is hugely deficit in protein. Some farmers have grown stylo to help address this but have only just introduced it to the diet. Animals are fed each morning and evening and they receive the same diet regardless of their age, size and reproductive state, quantities vary dependant on size only. Small pigs are allocated one bowl and bigger pigs two. On saying this, pigs of all sizes access the same feeding trough and the bigger pig naturally dominates. The only water made available is what they receive mixed with their feed.

This year is the first year that pigs have been vaccinated against CSF – again as a district initiative and administered by DAFEO staff. In past years pigs have died in alarmingly large numbers, especially at the onset of the rainy season. This year there have been fewer losses. However, pigs, especially the young, continue to die throughout the year. Symptoms are loss of appetite, diarrhoea and subsequent weight loss. There are no parasite control measures taken, no antibiotics or other health remedies provided. Pigs are often purchased from neighbouring areas or from the local market and introduced to the village without any quarantining procedures. There have been instances when both home pigs and introduced pigs have died shortly after purchasing and most farmers are aware of how disease comes. One farmer has rebuilt her pens in a more isolated area 3 kms from the village in an effort to keep her animals safe. Unfortunately someone needs stay permanently with them now as theft is the new 'disease' she is faced with.

Sows first mate at one year of age onwards and produce one litter a year. Litter size is small, usually only 5 -6 piglets are born. Piglets usually survive the first few days but it is not uncommon for 1 or 2 to die or fail to grow because of lack of mother's milk. Even with small litters, lactating sows quickly become very thin. There is no planned weaning, piglets wean themselves. Male piglets are castrated at around three weeks of age, this service being provided by the DAFEO staff. This has meant that there is a lack of boars for breeding purposes and farmers now lease a boar from neighbouring villages in return for a 5kg piglet from the litter. Again, these boars are introduced and returned without a quarantine period. Being situated close in to the district centre, there are no problems with markets, traders only too happy to source animals with the minimum of cost and effort. The biggest problem is getting the pigs to saleable weight, it takes up to 2 years for an animal to reach 60kg. Pigs at lesser weight are slaughtered for local festivals and ceremonies or sold if ready cash is required for emergencies.

Options for early interventions

Cattle/buffalo

- Worm control in calves to reduce mortalities associated with Toxocara infestation
- Animal health awareness programmes (village cluster)
- Improved feeding systems (cow calf management).

Pigs

- Improved housing and hygiene
- Improved feeding/water supply with a more balanced diet (stylo as a protein source already established)
- De-worming
- Preventive disease control strategies including animal movement control and quarantining
- Improved boar/sow management

NaKhao Village,

Vieng Xai District, Houaphan Province

19/08/2006

Introduction

NaKhao Village is situated in a narrow picturesque valley, 15 kms east of Vieng Xai district centre and straddles highway No. 6, an unpaved road leading to Na Me township and on to the Vietnam border crossing. It is a relatively newly settled Hmong community, pop. 419 (205 ♀), and is made up of 56 HHs and 68 families. Although crop production from the 32ha of upland rice and 3.6ha of paddy is considered to be the priority activity, livestock production is essential to their physical and emotional well-being. While almost all families raise chickens, 32 HHs also raise buffalo, cattle, horses, pigs or fish (ponds). The sale of these animals provides money for household necessities but more importantly for health and education needs. Just as important are the large number slaughtered for home consumption, especially at times of spiritual/cultural festivities, weddings, deaths etc. Brides often receive a cattle beast or buffalo from their families as a dowry. Buffalo are also used for draft purposes for paddy preparation and horses for pack work.

Members of the village own 100 large ruminants, 32 horses, 29 goats, 20 pigs and 481 poultry.

A recent village PD conducted by the CBSLSP Project identified livestock disease and lack of feed as the two major constraints to animal production (refer PD). Farmers interviewed spoke of adequate feed resources in the uplands while a pinch period occurred in the lowland areas from February through to May. Death of animals, especially in buffalo calves, was considered a priority issue.

There were unfortunately only nine farmers (6♂,3♀) present at the meeting, four of them married couples. This is because the assessment team were forced to change their itinerary due to heavy rain and road blockages and Nakao farmers were not informed of the change in plans and were busy in the uplands. There were no horse or goat owners present and the management of these animals was not able to be investigated.

Cattle/buffalo management

There are 100 buffalo and cattle, belonging to 32 families in Na Khao Village. These are run together as a single mixed breed/sex/age herd and from June through to December graze 'native pasture' in the forested upland area on the southern side of the village. District regulation has identified specific areas allocated to livestock and crop production and this upland area has been assigned to the free grazing of livestock. Villagers were unsure as to the size of the area except that it was 'big'. It takes 1½ hours walking from the village to reach it. There is nobody permanently tending the animals but the owners share the responsibility of checking them daily, depending on time availability and work load of the individuals. Both ♀ and ♂, sometimes children, share this responsibility.

During this June – December period there are no management inputs and animals roam and graze without any constraints/restraints. Each year there are losses (this year 1, last year 2 lost by those interviewed, they were unsure as to the total village loss). These are due to attacks by 'small tigers' and from local hunters and thieves. It is thought that the theft is done by people within the local community but there is no proof to support this.

Animals are brought down from the uplands late December in 'fat' condition. Farmers indicate they are happy with the condition of their animals during this free grazing period and nutrition is not an issue. Animals have access to good clean drinking water at all times.

From January - May they graze lowland areas, rotating around the paddy crop stubble and local vegetation areas adjacent to the village. During this time, there are periods when animals are constrained either by tethering or behind fences. New district regulations demand that animals do not roam freely in the agricultural areas and this has become a contentious, hotly debated issue. Farmers complain that fencing is expensive and repairs and maintenance costly and time

consuming. Inquiries have been made as to the possibilities of 'living fences' as a viable cost effective option.

Although half the farmers interviewed voiced no concerns about the condition of their animals during the lowland grazing period, a number observed that their animals slowly started to lose condition from February onwards. This is a critical time in the livestock calendar as calving, mating and draft activities occur during this period. This year, five families established improved pasture plots to help address the feed deficit periods but these are not as yet producing sufficiently.

A small number of calves are born in mid-late December while animals are still in the uplands, but the majority are born in January/February when closer to home. The cows are usually separated from the herd and tethered close to home where they receive preferential treatment, usually in the form of 'cut and carry' local grasses and tree leaf. There are no calving difficulties, no mis-mothering and cows reported as milking well. Cows and their offspring return to the herd 3 – 4 weeks after calving in 'strong, healthy' condition. There is no planned weaning, this happens naturally over time.

Mating takes place while the animals are grazing the paddy stubble. This is an uncontrolled opportune activity, the 'older, stronger' bulls dominating. On saying this, farmers have noted that on occasions fathers are mating with daughters, sons with mothers etc. Bulls are left entire and no outside blood lines have been introduced. Cows first accept the bull at 4 yrs of age, first caving at 5 years of age. They continue to produce one calf every year until they are culled as 10 year olds. 'Undesirable' cows are sold for slaughter at an earlier age, bulls at 6-7 years of age.

Buffalo males are required for draft activities, commencing in early May. These animals remain in the lowland paddy area until their work is finished, they are then taken to the upland to join with the herd. During this time of draft, no preferential feeding or treatment is provided and animals lose condition. This appears to be accepted as they quickly gain weight when returned to the upland grazing area.

Although disease is recognized as the leading constraint to village livestock production, there are no animal health inputs and no practicing Village Veterinary Worker (VWW). Areas of greatest farmer concern are the death of buffalo calves from wasting and diarrhoea (toxacara?) and the occasional death of older animals showing symptoms of Haemorrhagic Septicaemia. The majority of deaths occur while the animals are in the uplands where treatment is difficult to deliver. Whenever possible, the meat from dead animals is eaten. The PD indicated September and October as times of large ruminant mortality but farmers say that buffalo calves start to die in April while still in the lowlands. Ticks and other external parasites are observed but left unattended. Farmers are aware that disease can come from an outside source (pigs and poultry often die after they come in contact with introduced animals) but because theirs is a 'closed' herd they are not concerned. Other losses occur through wild animal attacks, hunters, theft and the occasional animal being separated from the herd and becoming lost.

Farmers indicate the market for cattle and buffalo is strong, the village receiving regular visits from trader 'middle men'. Animals are sold primarily for the Vietnam and Vientiane markets and farmers presently receive Kip 24,000 kg liveweight (meat value).

Pig management

There are only 20 pigs owned by four families in the village. These families are breeding and fattening but there are times when others will buy in young animals to fatten when disease is considered less a risk. The breed of choice is the large MuLaoSuang. The pigs presently managed are all enclosed in pens with a small roughly built thatched roof, earthen floor, open sided shelter provided. The womenfolk look after the animals and it takes on average two hours a day to source, prepare and feed the pigs.

Boars, sows and piglets are managed and fed together in the one pen. There is no planned mating, nor is there a specific time for weaning – the piglets wean themselves. The sow produces a litter of 5 – 6 piglets three times every two years. It is very seldom that piglets die between birth and sale time, theft is considered the biggest problem. Young males are not castrated.

Pig nutrition is considered not to be a major issue, the animals are always fat. They are fed twice a day, morning and evening. The quantity each pig receives is unknown and pigs of all sizes have same time access to the feeding troughs. Farmers say that this is not a problem and all pigs are fed to full. The sow may lose a little condition while lactating but she quickly regains it. Rice bran, household waste, vegetables and banana stem is available all year round and cassava root and maize added to the diet when it is available. Most young pigs are sold to local traders at 6 months of age when they are approximately 60 kg liveweight. Traders weigh the pigs and the sale price is Kip 20,000/kg.

There are no animal health inputs – neither vaccines nor medicines and dewormers. The attitude towards disease is possibly a carry over from when the village lived in the remote disease free uplands. Unfortunately, since being in their present location, disease has struck on two occasions, in June and in January and pigs have died. The village is exposed as it lies on a major through road and traders, often with animals on board, call in regularly.

Options for early interventions

Buffalo/cattle

- Worm control in calves to reduce mortalities associated with Toxocara infestation
- An effective preventative HS vaccination programme.
- Cow/calf feeding and management.
- Dry season nutrition

Pigs

- Improved housing/hygiene/feed troughs
- Sow and piglet management (the pig cycle)
- De-worming
- Disease awareness and preventive disease control strategies including animal movement control and quarantining

Table 2.3 Characterizing Livestock Production Systems (6 new Districts)

Site / village (HHs)	Ethnic	Cropping	Animal. / HH	Feed / Management		Disease / VVW	Fertility
				Grazing			
Phaoudom Xaysavang (55)	Lao	Paddy, maize (contract)	90 buff / 11 HH	Fenced areas, supervise in day, Village at night	Increase in herd + cash crops → less feed	Some HS Some toxacara 340 VVW, 10% active	free
			80 pigs / 13 HH	Rice stubble after harvest Pens + free-scavenging Women 2 hr /day Rice bran and taro leaf	Ju/Jly natural feed deficit Hi - fibre diet → low AWG Low milk to weaning Lack bran Aug - Oct Low AWG: 1 yr to reach 60kg	30% mortality (CSF) in '06	1 litter /yr → 6-7 Weaning 5-6 mth
Vieng P. Kha NamO (147)	Khamu	Upland, with paddy (50ha)	80 cattle / 22HH 100 buf / 29HH	Grazing area / check 2/3 days DS graze stubble + guard Closed herd to limit disease	Feb- Mar lack natural feed Decrease land, conflict with rubber	No disease 3yrs Toxacara	Free Calf each yr. No outside breeding
			254 pigs / 10HH	Pens + free-scavenging Women: 2-3 hr/day Rice bran 30% - protein	Lack bran Aug - Sept Low milk → piglet loss, sow thin Low AWG: 1 yr to reach 40kg Feb, May lack natural feed Conflict with crops due to poor supervision	Each yr. 10-20% CSF DAFEO staff provide service Some HS Toxacara VVW not active	1.4 Lt / Yr → 5-7 Wean @ 4-5 mth Males castrated
Phomethomg (96)	Khamu	Paddy	5 cattle / ? 20 buff / ?	Grazing area / always watched Feed on stubble / supervise(?)		free	free
			150 pigs / 38 HH	Pens, + free-scavenging Women - 2-3 hr/day Rice bran - protein	Small pigs miss feed Bran lack March - June Low milk Low AWG: 1 - 2 yr to sell	CSF each year Road accidents theft	1 Lt / yr → 8-10 Wean 7 @ 4-8 weeks
Phonexay Donexai (56)	Khamu	Upland rice (78 ha 06)	68 buff / 10HH	Grazing area / always watched	Feb - May lack natural feed	Each yr 1-3 die (HS) Toxacara 50%	Free 2 calf / 3 yr (?)
			160 pigs / all	Pigs raised inside / outside village Penned + free-scavenging Rice bran based diet - protein	Bran lack June - Nov Low AWG - 1 yr to 40-50 kg Lack milk	Each yr CSF 30% VVW inactive	1 Lt / yr → 7-8 Wean → 3-4 Males castrated

Khoun Nalam (81)	Hmong	Paddy + upland rice,	135 cattle / 47 HH 76 buff / ?HH	Grazing area / check 2x/week DS graze on rice stubble/free. Fighting bulls staff fed cassava Fully penned Women 2 hrs /day Bran, fibre diet	Herd increase → lack grazing	Some die each yr (HS) No VVW Treat for toxocara with NO deaths! CSF each year theft	Free
			25 pigs / ?HH		1 yr to reach 50kg Village Regulation to house pigs → many HH abandoned pigs due to difficulty to provide feed!!		1 Lt / yr → 5-7 Wean 3-5 Males castrated
Viengxay Nakhao (56) Recently re- settled	Hmong	Upland rice > paddy (3.6 ha)	123 cat/buff / 32 HH	Grazing area / check daily DS graze lowland crop residue	Good condition, with some concern about condition, Security is issue Dist. Reg. against roaming	Toxacara Some HS Small tigers Theft No VVW	Free No outside blood lines
			20 pigs / 4 HH Others buy in to fatten	All penned Bran, plus cassava, maize etc. Women: 2-3 hr /day	Pigs always fat 6 mth to reach 60Kg	Theft main concern Dis. expected in new location	2 Lt / 3 yr → 5- 6 Wean all
Vienthong Samphantong (76) 'in-district town'	Hmong	paddy	20 cattle / 9 HH 25 buff / ? HH	Grazing area / check 1/week Ds graze in lowlands/ watched Return to village at night	Herd increase → lack grazing Reg. stops expansion of grazing → house stock next to forage!!	Little disease Toxacara District keen to vaccinate Tigers (4 / '06)	Free
			71 pigs /30 HH	Reg. – all pigs penned → but stressed Rice bran diet, plus cassava, maize	Protein deficit Lack of milk	High deaths (CSF) '06 vaccination → few deaths	1 Lt / yr → 5-6 Wean 3-4 lack of milk Male castrated Boars leased

ANNEX 3 FIELD ACTIVITIES AND RESULTS

Table 3.1 Establishment of District Forage Nurseries

District	Date Planted	Area (m ²)	Management (staff/farmer)	Issues
Phaoudom	2 / 4	1600	farmer	Well managed 'gamba' - germination (1%)
Vieng Phoukha	5/4	1600	staff	Poor weeding; watering, uneven est.
Phonexay	2/4	1600	Farmer	Heavy weeds
Khoun	6/4	1600	Farmer	Slow growth due to poor soil, fertilizer added
Viengthong	31/3	1500	staff	Excellent growth
Viengxay	5 / 4	1600	Staff	Good but suffered from flooding

Table 3.2 Establishment of Farmers' Forage Plots (Y2006)

Province	District	Village		Site of plots			Cuttings		Seed Area	Date/Issue	Preference	Comments
		Name	HHs	Hs	Ani	Issue	Area	Date/Issue				
Bokeo	POD	Xay Oudom	139	1	1		100	7/7/06	600	7/7/06. Low germination rate, ants.	stylo	
		Hadkham	36	4	4	shade	30	26/7/06 Planting date - late, Harvesting tech. poor	215	9/7/06. Low germination rate, ants, high seed rate	Stylo	
		Nahome	37	1		flooding, slice stones	138	6/6, 25/7/06. Flooding, Planting date late, poor harvesting technique	269	2/4, 12/7/06. low germination rate, high seed rate, poor soil prep. flooding and ants	Stylo, Mulato, Paspalum, Guinea	
		Xaysavang	49	5	5		133	12/7/06. Ants, drought,	229	7-13/7/06. Drought, ants, low germ.	all species	
Luang Prabang	VPK	Namkiang	45	2	3		71	25/7/06. Planting date - late, Old stem	150	9-29/7/06. High seed rate for stylo, low germination of grasses		
		Nongkham	117	1	1	planting time too late	30	14/7, 2/8/06. Flooding, Planting date - late, Limited land	210	27/6/06. High seed rate, low germ. for grasses	stylo	
		Nam O	147	1	2		458	14/7/06. Old stem and some died after growing	253	24/6/06. Low germination rate for grasses	all species	poor germination of Guinea, old stem
		Phonethong	86	4	3	shade, infertile soil	20	5/8/06. Old stem, not suitable site	200	1-9/6/-6. Pest for Guinea grass, high seed rate for stylo Low germ. for grasses	All species	Stem old; plants on sloping land better
Luang Prabang	PHX	Donexay	74	-	-	-	48	8/8/06. Planting date - late, infertile soil	180	1/7/06. Poor soil prep.; low germination high seed rate		
		Houaysignua	86	1	1	-	20	8/8/06.	140	15-19/6/06. Low germ. grasses, ants		

		Phakhok	90	3	3	Pest, ants, rats, weeds	96	16/6, 28/8/06. Planting date - late	96	6-25/6/06. Seed arrived late, high seed rate, low germ. of some grasses	all species	
		Houameuang	81	-	-	-	104	8/8/06. Planting date - late	320	6-8/6/06. Poor preparation of soil, high seed rate	all species	
Houaphanh	VIX	Nakhao	56	4	-	-	106	15-28/6/06	225	17-29/6/06. Ants, rains, high seed rate		expanded area by cuttings
		Phoukang	31	5	2	Infertile soil, shade	165	29-30/6/06. Planting date - late Cuttings - old, poor quality.	185	29-30/6/06. High seed rate for stylo, low germ. of grasses		
		Kangpabong	66	3	-	Shade	41	29/6, 16/7/06. Lack of cuttings bad cutting techniques	112	29/6, 4/7/06. Land prep. - poor Low germ. grasses High seed rate - Stylo	Stylo, Guinea	
		Phounneua	55	3	-	Infertile soil, shade	57	29-30/6/06. Planting date - late, drought	135	29-30/6/06. High seed rate poor soil prep.	Stylo	
Houaphanh	VIT	Namneun	46	4	3	Shade	64	30/6, 11/7/06	398	30/6, 11/7/06	All species	
		Bouamfad	32	5	4	-	44	30/6, 10/7/06	39	30/6, 10/7/06		
		Meuanghiam	48	3	3	Close to river (w.s)	185	31/6, 3/7/06	147	1-17/7/06		
		Samphanthong	74	-	3	Plant maize waiting for seed	82	30/6, 3/7/06	175	30/6, 10/7/06		
Xieng Khouang	KHO	Namlanh	35	5	-	Shade	249	27/6, 8/9/06. Lack advices on cutting, infertile soil	370	27/6, 5/7/06. Low germination rate, poor preparation of land, high seed rate	Guinea, Mulato, Brizantha, Stylo	
		Nalam	81	1	3	Shade	15	28-29/6/06. Not enough stem, old stem, no rain at planting time	318	28-29/6/06. Poor preparation of land, chicken, high seed rate for stylo	Happy with forage plot	
		Thenephoun	76	3	3	-	314	27/6, 25/8/06. Long time to transport, sun, no soil in root	320	27/6, 25/8/06. Low germination rate, ants, heavy rain		
		Sivengkham	57	4	3	-	5	28/6/06. infertile soil	174	28/6/06	all species	

Table 3.3a Initial use of forages: new villages (Dec. 2006)

Province	District	Village		Use for forages			Emergent change in management	Livestock Condition	Type of animals
		Name	HH	Everyday period	When need	Evening			
Bokeo	POD	Xay Oudom	139	1			Keep close to the house	-	Pigs
		Hadkham	36	2	2		Keep close to the house	Fatter, brilliant skin	Cattle, fighting, bulls Buffaloes
					1			Fatter	Pigs
		Nahome	37	2			Close to the house	Red skin, fatter	Cattle
		Xaysavang	49	3	3		Easier, close to the house	Fatter, thirst,	Pigs
Luang Namtha	VPK							Fatter	Buffaloes
				6			Close to the house	Brilliant skin, high weight gain	Pigs
		Namkiang	45	3			Use less time for cutting and easier, close to the house	Cannot see yet	Cattle, buffaloes
				5			Close to the house	They have just started	Pigs
		Nongkham	117	4			-	Not yet result	Cattle, buffaloes, goats
				5			Keep animals in confine areas	Fatter	Pigs
		Nam O	147	3			-	No result yet	Cattle, buffaloes, goats
Probing	PHX			3			Close to the house	Fatter	Pigs
		Phonethong	86	1			Easier	No result yet	Cattle, buffaloes, goats
				5				healthier, fatter, good temperament	Pigs
		Donexay	74	5			-save labor and time, children can help parents to feed animals after work	Fatter	Buffaloes, goats
				5			-	Fatter	Pigs
		Houaysignua	86	2	2		-	-	Cattle, buffaloes, goats
				5			close to the house	Fatter	Pigs
		Phakhok	90	3			-	Need more water, fatter	Buffaloes, goats
				5			close to the house	Need more water, fatter	Pigs
		Houameuang	81	5			- use forages for a cattle with accident can maintain body condition	- Using forages for calving buffalo looks stronger and more milk (during 45 days period) - Fatter, stronger	Cattle, buffaloes

					5					- Bring animals close to house from other areas -before they used a small container (a galong = 5kg) of rice bran for 2 days, but now up to 3-4 days	- using stylo mix with local feed can improve body weight up to 20 kg during 2 months period - before a sow gave birth 5-6 piglets, now up to 8 - before they fed as much as they had, but pigs still thin even for consume nobody wanted - Fatter, stronger,	Pigs
Houaphanh	VIX	Nakhao	56	2	2					Fatter		Cattle, buffaloes
				2						No result yet		Pigs, turkeys
		Phoumkang	31	2	2					Fatter		Cattle, buffaloes
				5					Pens are improved, raise close to the house	Red skin, fatter		Pigs
		Kangpabong	66	1				-		Fatter		Cattle
				5				Pens are improved, raise close to the house	Fatter, skin change color		Pigs	
	VIT	Phounneua	55		1			-		No result		Buffalo
				3				Pens are improved	Red skin		Pigs	
		Namneun	46	3				-		Skin color looks better		Cattle
		Bouamfad	32		4			-		Animals can eat more, calf growths faster		Cattle
				2				Raise close to the house	Looks better		Pigs	
		Meuanghiam	48	4				Fatten, close to the house	Fatter, more milk		Pigs, goats	
Xieng Khouang	KHO	Samphanhthong	74	3				-		Need less water		Cattle, buffaloes
				3	1			Forage plot is close to the animals, no free range	Fatter		Pigs, fish	
		Namlanh	35	5				-	Fatter		Cattle, fighting bulls	
				2				Fatten	-		Pigs	
		Nalam	81	1	4			-	Eat more		Cattle, fighting bulls	
		Thenephoun	76	3				-	Fatter		Cattle, buffalo, goats	
				3				-	Fatter, skin becomes red		Pigs, ducks, chicken	
		Siviengkham	57	2				-	-		Cattle/buffalo	
				1	2			Close to the house	No result		Pigs	

Table 3.3b Use of Forages and intensifying systems: new villages (Nov. 2007)

Province	Dist.	Village	HH	Forages			Intensification - Pigs			Intensification - Ruminants		
				% village planting	Fed to- Pigs (HHs)	Fed to- Rumnt. (HHs)	Feed (% vill)	Mngmnt (% vill)	Health (% vill)	Feed (% vill)	Mngmnt (% vill)	Health (% vill)
Bokeo	POD	Xay Oudom	137	12	16	-	12	-	12	-	-	-
		Hadkham	32	33	8	6	22	19	33	18	-	33
		Nahome	37	51	19	14	11	-	50	-	-	50
		Xaysavang	48	26	5	5	10	-	16	6	-	-
		Donekeo	55	18	10	0	0	-	-	-	-	-
		Pengthong	122	13	17	11	9	-	13	-	-	13
		Namkiang	47	44	20	20	44	44	44	-	-	-
Luang Namtha	VPK	Nongkham	112	8	10	3	5	9	9	2	-	2
		Nam O	150	12	17	14	12	12	12	1	3	12
		Phonethong	85	20	20	6	19	21	19	7	-	-
		Phadaeng	50	18	36	9	18	18	18	-	-	-
		Lailot	65	30	20	7	30	3	28	2	-	-
		Donexay	73	32	23	23	14	31	31	-	-	18
		Houaysignua	98	12	10	10	2	12	12	-	-	9
Luang Prabang	PHX	Phakhok	88	14	13	13	7	14	14	-	-	-
		Houameuang	81	27	15	15	7	19	19	-	-	5
		Sopchia	72	10	9	9	13	13	13	-	-	-
		Paknaa	126	6	9	9	8	9	9	7	5	9

Table 3.3 b (cont.)

Prov.	Dist.	Village	HH	Forages	Intensification - Pigs	Intensification - Ruminants	Prov.	Dist.	Village	HH	Forages	Intensification - Pigs	Intensification - Pigs
Houaphan	VIX	Nakhao	56	50	4	5	7	7	2	7	7	7	-
		Phoukang	30	34	7	5	22	22	12	-	-	-	-
		Kangpabong	68	18	12	4	18	18	8	2	-	-	-
		Phonneua	32	18	7	3	6	13	13	-	-	13	-
		Longkou	43	20	10	1	23	23	12	-	-	-	-
		Viengphanh	92	5	4	5	4	4	-	-	-	-	-
	VIT	Namneun	48	12	3	5	0	6	-	2	2	-	-
		Bouamfad	32	35	3	6	9	9	-	18	-	-	-
		Meuanghiam	48	15	24	2	41	50	8	4	4	2	2
		Samphanthong	78	15	8	2	2	7	11	3	3	-	-
Xieng Khouang	KHO	Kokieng	71	53	37	5	39	53	39	7	-	-	-
		Nampung	65	19	12	1	17	18	8	2	2	2	2
		Namlanh	41	74	8	26	22	11	-	74	-	-	-
		Nalam	80	35	4	15	5	5	-	19	19	-	-
		Thenephoun	76	26	11	15	13	4	8	17	-	-	20
		Siviengkham	56	35	27	17	47	29	29	5	5	33	33
		Phoumoungmeuang	102	42	8	22	9	12	-	-	-	-	-
		Sanking	66	19	14	15	14	14	-	3	4	-	-
				Av. 25	480	328	Av. 15	Av. 15	Av. 11	Av. 5	Av. 1.5	Av. 6	Av. 6
			2564										

Note:

Intensification was recorded when:

Feed – forages were a regular part of the diet, rather than used only occasionally to resolve labor constraints

Management – animals were confined / penned

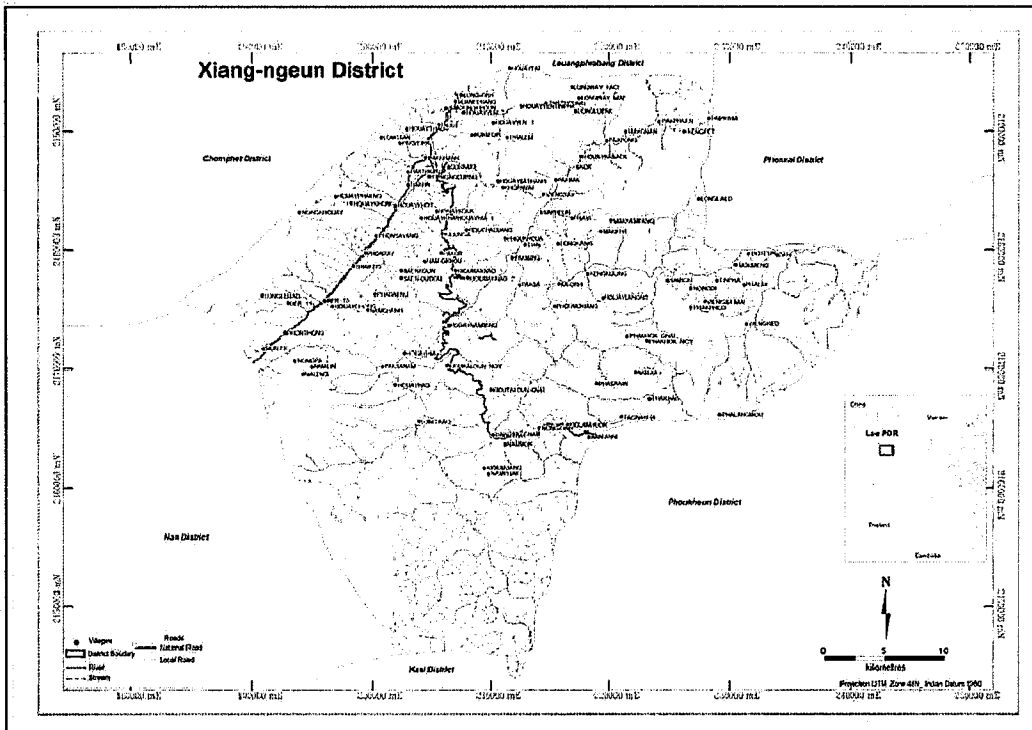
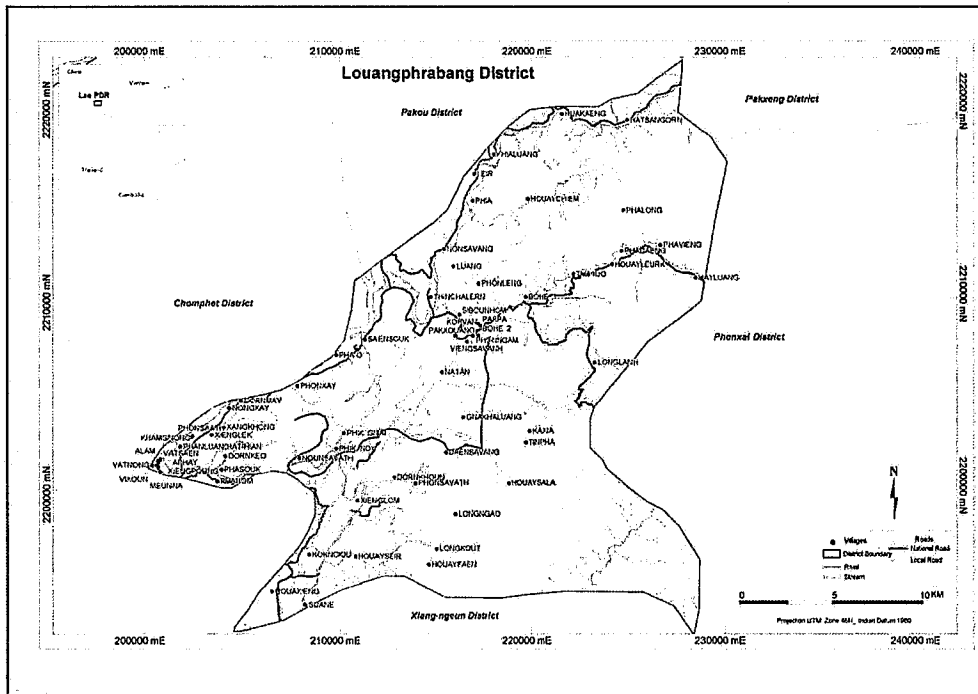
Health – de-worming was carried out (although in some village vaccination was performed, this was not counted as it was provided by staff and thus not indicative of farmers adoption)

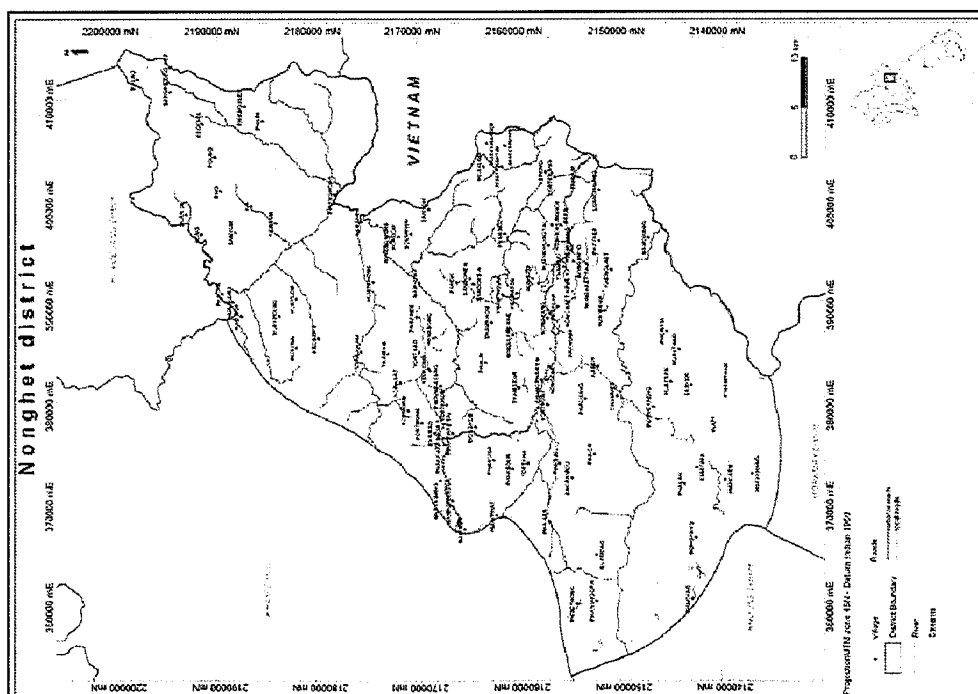
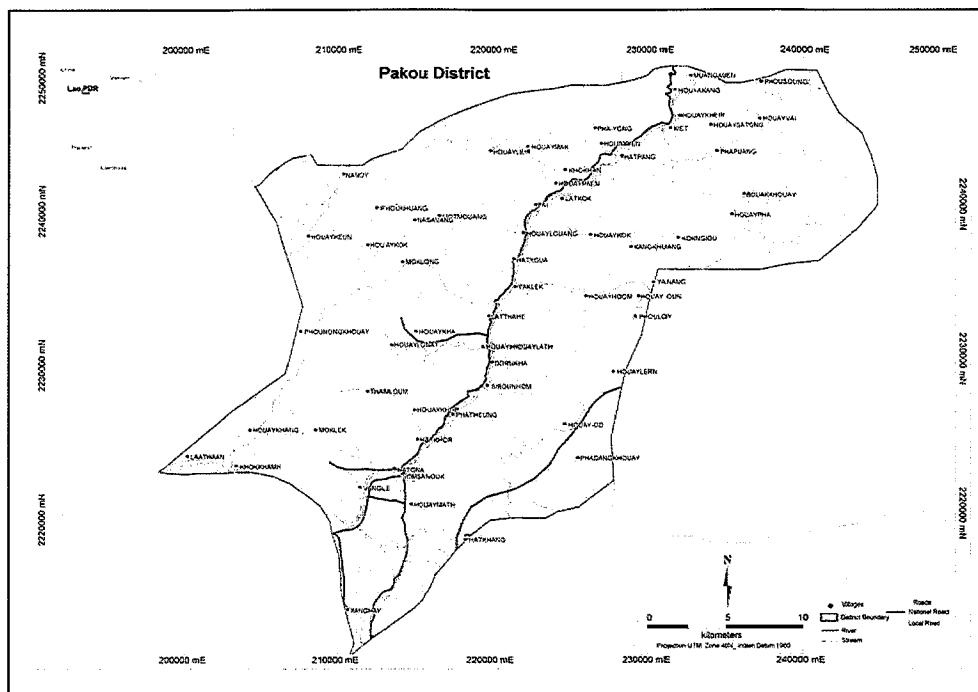
The data collected by individual staff in separate districts and thus will not be fully consistent in interpretation across sites. Nonetheless it is indicative of significant intensification.

Table 3.4a Selected 'Old Villages': mentor districts.

District	Significant forage use – Target integrated systems	Forage established – Expansion of forages
Paek	Xang	Vieng
	Or Ann	Pakham
	Pontong	Nasala
	Phonekham	Lao
	Phone	Muan
	Berp	Taa
	Kangdone	Viengkham
	Mon	Miang
	Nalam	Mee
		Doxang
Nong Het		Nakhuan
		Latphuen
		Nyapsi
	Sayom	Phaphuer
	Tumseua	Phabong
	Khampanien	Pha Ann
	Phou Huaxang	Khokmou
	Kor mome	Kor had
	Yort Kor	Huaykhiling
	Keopatu	Nongkob
Total Xieng Khouang	Namkuang	Korthong
	Pha hok	Nongkhiao
Xiegn Ngeun	Nong Or	
	Ber 11	Phoukhua
	Hauei Hia	Nongkhouang
	Silalek	Ber 10
	Phoneavang	Kiotalouna Gnai
	Kieu Nya	Phonesaat
		Kiomaknao
Luang Prabang		Huay Thao
	Nong Torp	Phasi
	Phon Ngam	Meuang Khai
	Pik Noi	Na done khoun
		Khokman
		Naxao
		Pik Gnai
		Phavieng
		kokvanh
		Viengsavanh
Pak Ou		Borlek
		Longlanh
		Kokngio
	Hat Pang	Somsanouk
Total Luang Prabang	Hat Kham	Phonesavang
	Hat Nya	
	Norn savanh	
Total Mentor villages	32	21

Table 3.4b Maps of Mentor Districts





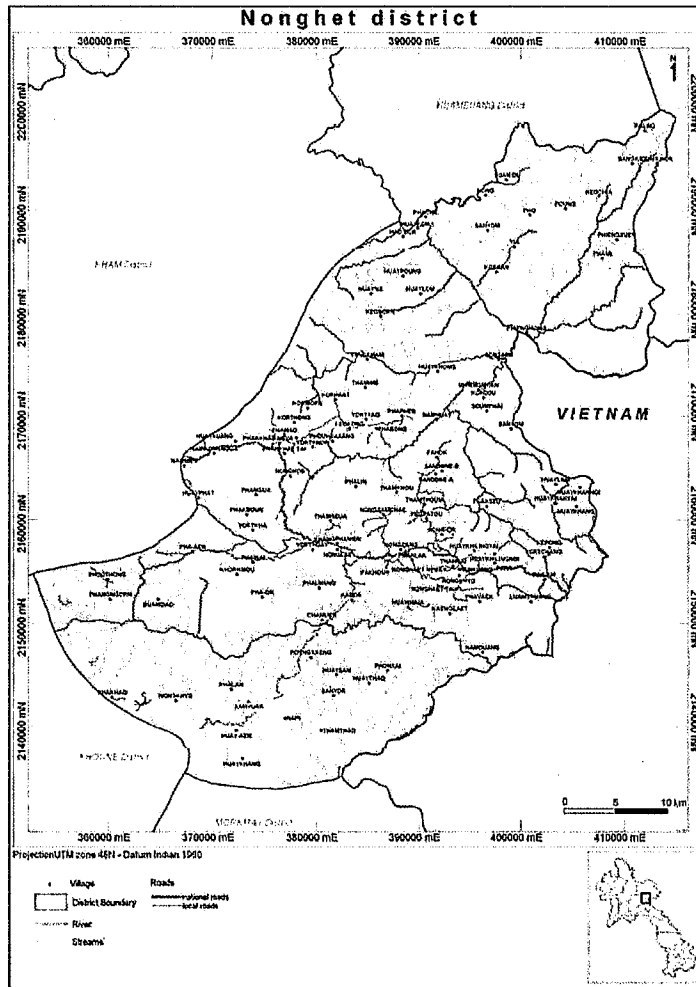


Table 3.5 Review of Village Poultry and Technical Options

REVIEW OF VILLAGE POULTRY PRODUCTION SYSTEMS LUANG PRABANG PROVINCE, LAO PDR

1. INTRODUCTION

The review of village poultry production systems has been undertaken by the CBSLSP at the request of the Department of Livestock and Fisheries (DLF). The objective of the review has been to investigate existing poultry production systems in Luang Prabang Province to determine whether there are any simple, practical and effective sustainable models that can be replicated by CBSLSP and later by the NRSLLDP (ADB Loan 35297). Although the review focused on poultry management systems in Luang Prabang Province, experiences and observations have also been drawn from a recently conducted CBSLSP livestock assessment in Houaphanh, Xieng Khouang, Bokeo and Luang Namtha Provinces.

Although 20 - 25% of village households raise different types of poultry, most noticeably ducks and turkeys, the review has focused primarily on chicken production.

Taking into account that women and children are traditionally the village poultry caregivers, 80% of those villagers who participated in the survey were women.

Seven villages were assessed in Luang Prabang, Xieng Ngeun, Pak Ou and Nam Bak Districts. Two of the villages have not had the services of a VVW, nor received any project or NGO assistance in poultry production. They raise poultry according to their 'traditional' methods and thus can be considered as the 'control' to compare with villages which have adopted improved methods. The other five villages have received assistance in poultry production from the following projects:

- a) Lao Extension for Agricultural Development Project (LEAP), - 2 villages
- b) Lao-EU Strengthening of Livestock Services and Extension Activities Project (SLSEAP) - 2 villages and
- c) World Vision (WV). - 1 village

These inputs provided by projects have included extensive training in village poultry production systems, technical assistance in areas of disease control and general flock management, the introduction of improved breeds, the establishment of a Village Veterinary Worker (VWW) network and the provision of credit. One village has a resident SLSEAP trained VWW but has received no other project assistance.

Although it is the womenfolk who are largely responsible for the day to day management of village poultry, 90% of those who received project training and assistance have been male. The menfolk interviewed all declare their poultry management has improved since having received this training and their chicken housing design and construction does show improvement when compared to neighbouring units. However, biosecurity, nutrition and health inputs remain lax and discussions with the wives indicate that there is very little improvement in production performance.

2. VILLAGE POULTRY PRODUCTION SYSTEMS (EXISTING)

Almost every village household keeps domestic fowl (on average between 5 and 20 birds with the odd wealthier family owning up to 100), the most important species being chickens. Local breeds predominate, in particular the larger *gai yok*, the medium sized *gai lat* and the smaller *gai jeh*. A number of families in three villages have had experience in raising the imported yellow chicken but all these birds perished within the first nine months.

The birds are managed mostly by women and children (men are responsible for housing and utility construction) and are bred for home consumption (peak work periods), small cash income and social and cultural activities. Whereas women manage the proceeds from intermittent sales (usually for small household necessities, health or children's educational needs), any inputs that require cash expenditure involve the approval of the male head of household. In almost all cases it appears that the menfolk are loathe to spend money on a production system that returns them little personal financial gain, they tend to regard poultry as a low-input/low return enterprise

Village poultry production is based almost exclusively on a free range semi -scavenging 'low input – low output' production system. The majority of birds scavenge in the vicinity of the owner's house during daylight hours where they access environmental materials such as insects, worms, seeds and green forages. The availability of this material varies with seasons, climatic conditions, farming activities, social management and with flock type, numbers and behaviour. Each morning and night they are provided with an unknown quantity/quality of broken rice, rice bran, maize (when available) or other waste products as supplementary feed. Some families purchase small amounts of commercial feed for their chicks. There is little provision of clean drinking water, one village indicating that during the dry season they struggle to provide enough water for their own use let alone 'wasting' it on their birds..

All families provide night housing for their birds, albeit rudimentary. Only on one farm were the birds contained within an enclosure. The design of housing varies from family to family and from village to village and there are very few examples of good housing. Most were seen to be in varying stages of disrepair, with inadequate space and poor biosecurity and hygiene procedures in place. Removal of manure appears to take place when it is required to fertilize home gardens, fruit trees etc rather than for the birds well-being. Woven basket or purpose built nests are provided but there is no evidence of roosting perches.

Hens produce 2-3 clutches of eggs per year, laying 10-15 eggs per clutch. Hatchability ranges from 50 to 90% and varies with the season. Chick mortality is a problem with most hens rearing only around 4-6 chicks past two months of age. Although home grown chicken eggs are rarely consumed (there's a higher priority on hatching eggs to get more birds), wealthier families will often purchase eggs for consumption.

The most striking observation in relation to village poultry production is the high mortality. Mortality rates may be as high as 80 - 90% within the first year after hatching. The clinical signs described by farmers indicate Newcastle Disease and Fowl Cholera to be the most devastating disease in their free range systems and the main cause of the high mortality. Disease problems of lesser importance include fowl pox and ectoparasites.

The high attrition rate in young chicks appears to be due to a complex of factors including predation, malnutrition, disease and climatic exposure

Daily losses due to predators – mainly rats, cats and 'big birds' – and the ingestion of toxic material are common and the incidence of theft is increasing. Also on the increase in villages adjacent to a road is road kill. This is becoming more of a problem as an increasing number of villages are enjoying road access and traffic density is increasing.

Farmers respond differently in times of disease occurrence. A small number will approach their Village Veterinary Worker (VWW) or local district staff for assistance, some administer traditional medicines but the majority do nothing. Although there are no village vaccination programmes in place in the villages surveyed, some individual families have vaccinated with varying results. Since treatment (farmers are unsure whether vaccines or medicines have been administered) is usually attempted after the first deaths have occurred, results have led to farmer disappointment and mistrust of vaccines. Chickens continue to die post 'vaccination' and neighbouring farmers who provide no health inputs can see no reason to invest in a programme that doesn't work.

All but one of the villages reviewed enjoyed the services of a VWW. All are male. Their role as

village animal health/service providers has focused almost entirely on the treatment and vaccination of animals. VVWs have little village input into improving husbandry practices such as improved housing, supplementary feeding and good hygiene and in most cases their own livestock management and practices are no better than that of their neighbours.

A number of families raise their poultry outside of the village proper in the crop production area. Although management practices are similar to those experienced within the village, farmers appear to enjoy a higher level of productivity and bird survival under these conditions. This could be partly due to the birds being free to forage their own feed in a more productive environment and able to consume a more balanced diet while not being exposed to the same limitations and threats as their village counterparts. Unfortunately in many cases the benefits of increased production are often cancelled out by the higher incidence of theft.

Poultry are sold (25,000Kip/head) in the local village markets or to passing traders. The demand for poultry products would appear to be high but is a relatively localized activity.

3. PROJECT POULTRY PRODUCTION INTERVENTIONS

The review team visited 5 villages that have received project assistance in their poultry production. The projects involved are:

3.1 World Vision (WV)

As part of the WV programme, the SMILES chicken revolving loan fund project was implemented over a 2 year period (Oct 2004 – Sept 2006). The objective was to assist households in improving income and increasing ownership of assets to be sold in times of emergency and thus contribute to the reduction of poverty in the provinces.

Both government and project staff have been trained in poultry raising. These staff were then involved in training and supporting farmers in their poultry production activities. Farmers were informed of how a revolving loan works and were provided with contracts. They then received training in general poultry management including poultry health, nutrition and housing. There was also an awareness campaign on the dangers and implications of avian bird flu.

The selected farmers (10 families) received 10 yellow chickens of mixed age (>3 weeks). Offspring from these chickens were to be made available to other households in the village as part of a revolving loan fund. Households received some chicken feed during the distribution to help them get started.

In the WV village visited by the review team, only 4 yellow chickens were alive. Almost all project birds had died within weeks of arrival. Farmers believe the losses were due to cold weather conditions. When asked if the training they received did not prepare them sufficiently to prevent these losses they responded by saying the training came too late – the chickens arrived before the training commenced. They also believe that the yellow chicken is not the appropriate breed for them because of the higher management inputs required and market preference for the local breeds.

One farmer acknowledged that her chicken production had improved 'significantly' as a result of project activities. She is now able to sell a 'few' more birds each year. She considers herself fortunate that her husband is a VVW and contributes this as the reason for her improved production (her birds are running in the crop production area and they are one of the very few families who vaccinate). Six families indicated 'marginal' improvements in production but have yet to see an increase in sales.

Overall, with the exception of one family, the village poultry management, production and practices show little improvement on the 'control' (without project) villages. Birds continue to die in large numbers. There is no preventative health programme practiced, a small number

of families will vaccinate 'if they have the money to do so'. This is done after disease has arrived in the village and results are often disappointing. Even after receiving training on disease prevention farmers remain loathe to spend money on a system they consider unworkable.

Poultry nutrition is identical to the control sites, village scavenging supplemented by rice bran, broken rice and maize. The only commercial feed provided has been that supplied by the project for the yellow chicks. There is almost no provision of clean drinking water.

Housing design shows slight improvement (housing on stilts – slatted floors) but sanitary practices are lax. There are no birds enclosed and protected behind fencing.

There is little appreciation of mother/chick management and young stock remain vulnerable.

As has been observed in the control villages, there is an improvement in production when the birds are managed away from the village proper.

World Vision acknowledge the success of the project has been variable between households, villages and districts. Based on the two year chicken raising project implementation the following lessons have been learnt:

- There is a need for more careful selection in the farmers to participate in the program (they should have the willingness/ and ability to invest money in the chicken raising activities for feed and housing.
- More chickens will be provided to less farmers to make chicken raising more interesting for them
- Chicks of a minimum of 3 weeks will be provided to the different households to assure a lower mortality of chicks.
- Farmers will need to be trained in the production of feed and suppliers of feed will be encouraged to provide seed in the districts.
- Farmers will need to have the possibility to get a loan to do the preliminary investments for housing, health care and feeding.
- Full-time staff need to be appointed for this project to improve the monitoring of project activities and provide more in-depth training to farmers.

(CRP end of project report 2006)

3.2. Lao-EU Strengthening of Livestock Services and Extension Activities Project (SLSEAP)

The Strengthening of Livestock Services and Extension Activities Project started on 1 February 1998 and was completed on 30 September 2004. The general objective of the project was to enhance smallholders' financial autonomy and capacity of initiative by improving their income from livestock rearing. The specific objectives were: i) to strengthen veterinary services and the extension network at all levels for an efficient and sustainable delivery of animal health and production services and thereby ii) to reduce disease incidence, improve management practice and increase livestock productivity.

Amongst other activities, a Village Livestock Information System (VLIS) was developed which functioned as an extension and management tool as well as serving as a basic animal health information system. The training of community based Village Veterinary Workers (VWW's) was organised and given a national mandate. Farmers have been trained in improved animal husbandry skills and given access to small scale credit programmes.

Poultry parent stock keepers and 'model' farmers were identified through a selection process with the objective of implementing and demonstrating the extension messages and creating opportunities for farmers to exchange and learn from each other. Villagers formed

a Village Credit Committee and loans were taken individually via a group of 3 or 5 farmers. The loan duration was for a year and the loan amount from 50 to 100 Euro.

The review team visited 2 villages that have received SLSEAP inputs. In both villages a number of 'model' farmers had been established and yellow chickens provided. The presence of yellow chickens declined as project interventions waned and today there are none to be seen. All farmers agreed that the level of management required was higher than that needed for the local chicken and the returns for their efforts were disappointing and therefore not worth pursuing. Only one farmer would be interested in continuing rearing yellow chickens (if they could be sourced) and that was because they 'looked nice'.

Farmers involved in SLSEAP activities displayed a higher standard of hen house and utility design but the structures themselves are a little run down and hygiene is lax. There are no birds enclosed and protected behind fencing.

There is little appreciation of mother/chick management and young stock remain vulnerable.

Poultry nutrition is similar to that in the control sites, village scavenging supplemented by rice bran, broken rice and maize. Small amounts of commercial feed is provided to young chicks and clean drinking water is always available

Both the DEWs and VVW's appear committed and try desperately to convince farmers of the benefits of a preventative health care programme. Unfortunately their attempts fall on deaf ears as almost every family has experience of vaccinating and their birds dying post treatment. They no longer have trust in the system. It is interesting to note that all pig and large ruminant farmers in one village are totally acceptant and involved in a CSF and HS vaccination and de-worming programme yet totally averse to spending money on protecting their poultry.

Although there appears to be a better appreciation of poultry management in the SLSEAP villages, disease outbreaks continue to occur regularly and overall village production is little improved on that of the control villages. Birds continue to die.

3.3. Lao Extension for Agricultural Development Project (LEAP)

The extension approach and interventions used by LEAP were considered the most comprehensive and well implemented of the systems looked at. LEAP commenced activities on 1 November 2001. The projects main objectives are:

- Effective extension methods and delivery mechanisms based on farmers needs are identified and established
- The institutional set-up for the delivery of a decentralized, participatory, pluralistic and sustainable extension system is strengthened
- The district extensionists are capable of providing participatory extension services to the farmers
- The approach is continuously assessed and results exchanged with relevant institutions

Main activities are:

- to support training and coaching of central, provincial and district staff
- to undertake continuous assessments on extension methods
- to maintain strong networking between institutions involved in all levels of extension
- to support integration of women in extension services as well as in decision making at the field level.

The review team visited 2 villages involved in LEAP poultry production activities. In the first village, farmers talked of significant improvements in their poultry management due mainly to LEAP interventions. Improvements involving quarantining of introduced birds, predator protection and the removal of toxic materials from bird access have been greatly appreciated by the villagers. The village head (he has attended numerous poultry training courses

organised by various projects including LEAP), is actively involved in poultry production and appears very committed to the LEAP approach.

The design and construction of housing, nesting boxes etc are generally of a high standard although cleanliness of the units was not always observed. Nesting boxes and feeding/watering troughs were cleaned regularly. No enclosures were noted.

The birds are released from their houses every morning to scavenge with neighbouring birds. They receive the standard supplements of unknown quantities of rice bran, broken rice and milled maize morning and night. Commercial feed is purchased and fed to young chicks. Clean drinking water is always available.

Three years ago, on their own initiative, 30 families purchased varying numbers of yellow chickens from passing Vietnamese traders. All of these birds died within three months.

It came as a surprise to the review team that aside from occasionally administering traditional medicines (onion leaf), no vaccines or medicines are being dispensed. In 2006, 50% of poultry in the village died of disease, in 2005, 80% succumbed. While recognising this, the villagers show no willingness to implement a poultry health programme. At the end of the day, regardless of the improved housing and facilities, the returns from village poultry production are little better than those of the control villages.

In the second LEAP village, the review team were introduced to a 'champion' farmer who proudly displayed his poultry enterprise. It is an excellent example of poultry management at its best. This semi-commercial unit is enclosed behind a well constructed bird proof fence that contains in excess of 100 mixed age birds. Housing and chattels are of a very high standard, well designed and constructed. All birds are well grown and healthy, both hen and chick management is of a high standard. There is a preventative health programme in place, the farmer himself administering vaccines and medicines as required. No deaths have occurred over the past 2 years. Feeding involves a mixture of home grown and purchased commercial feed. For his efforts, this farmer enjoys a return in excess of 4 million Kip/year.

Thirty farmers in this village were initially involved in LEAP poultry production improvement activities commencing 2003 (?) Today there is only the one farmer who has made significant changes to his production systems. The remainder continue to raise their birds as they have in the past, incurring unacceptable losses every year. Their returns are no better than those of the control villages.

4. DISCUSSIONS

There have been continued efforts to improve village poultry production systems. In all but one of the villages reviewed, both government and non-government development organisations have recently been involved in programmes focusing on poultry health interventions, introduction of exotic birds or crossbreeding, improved housing and biosecurity facilities and the use of feed supplements. Farming households, however, are not adopting the suggested technologies widely. Many of the technologies have been inappropriately delivered (women are the caregivers but 90% of training participants have been male) and targeting the wrong people, are too labour intensive, too risky or simply too unprofitable. Village poultry production systems are complex. Changes in one production component often imply trade-offs in other components. The introduction of exotic or crossbred chickens, for example, may increase egg production per hen but at the same time require a better quality feed and management. Improvements to village poultry production should therefore be introduced with caution.

There are, however, a small number of families who have made significant changes and improvements in their poultry management and are now enjoying returns and cash flow that equal or even better those of their pig and cattle rearing neighbours. An example is Ms. Mo, a resident of Ban Korsy in Xieng Khouang Province. Ms. Mo, with technical assistance and direction from the LEAP project, turned her small back yard scavenging poultry unit into a very

lucrative income generating enterprise with returns in excess of Kip 800,000 a month (Schröter, 2006).

Also as a result of LEAP interventions, Mr Mai Sinouan from Vang Kham village in Nam Bak District, Luang Prabang, displayed an excellent example of poultry production systems at their best. His management, facilities and biosecurity are all of a very high standard and this is reflected in his high turnover and income. Mr. Mai Sinouan is now considered a 'champion' farmer and receives regular visits and study tours from Luang Prabang, Oudomxay and Luang Namtha provinces. Both Mr Mai Sinouan and the local DAFEO acknowledge the inputs from the LEA Project as being the catalyst to his success.

The question arises, however, as to why after three years of project input Mr. Mai Sinouan is the only farmer in the district who has made significant improvements in his poultry management. LEAP commenced poultry production activities in the village in 2003 working with 30 families but today only one farmer is continuing to benefit from these inputs. Village monthly meetings, an initiative encouraged by LEAP to identify problems and opportunities, continue to be held but appear to focus on data collection (no. of birds, how many vaccinated, how many died etc) and does little to address the root cause as to why problems and constraints are arising. Village poultry continue to die in the same numbers as pre project. Lack of a suitable area to raise chickens close to home, poor initial selection of farmers and general apathy were the main reasons given by Mr. Sinouan as to why the adoption rates have been so disappointing.

4.1 Major Constraints to Village Poultry Production Systems

The major problems related to village poultry production have already been well documented and continue to be:

- Endemic and epidemic disease and losses due to predation, theft and accidents
- Inadequate access to management and veterinary support and supplies
- Lack of a balanced diet
- Inadequate housing/shelter
- Lack of knowledge about simple biosecurity practices and
- Inadequate knowledge in regards to general flock management and
- Lack of village organisation and commitment.

Disease outbreaks appear to be the major constraint to poultry production, especially in flocks raised in villages rather than in the more isolated production areas. However, many other factors affect the efficiency of village poultry production either directly or indirectly. These include nutrition (or malnutrition), species, management, environment, extension services and other diseases and societal pressures that can interact in multiple ways that influence ultimate productivity.

Village poultry production has over the years attracted much attention due to the enormous potential for reaching the poor and improving village livelihoods. However, the general view has been that traditional village poultry production can only be improved by preventing disease through vaccination. This approach has not led to an increase in production. Disease is only part of the overall problem related to village poultry production. The impact of poor nutrition or nutritional imbalances and inadequate housing and sanitary procedures on poultry production and health makes the birds more susceptible to infectious or parasitic diseases.

Possibly the major challenge for improving village poultry production lies in the organisational aspects, not in the technical. Solutions for technical problems relating to disease, nutrition and management have long been recognised but how to organise production at village level for the benefit of small scale farmers remains a major task. For example, if vaccines cannot be delivered according to required schedules, small scale poultry production will never be successful at village level. To be effective against epidemic disease, vaccination campaigns should cover at least 80% of the poultry population and this requires the involvement of the service providers and village organisation. Also, as flock numbers increase, village organisation

needs to be called on to carefully manage bird populations so that the village environment can continue to support the nutritional requirements of the scavenging birds.

4.2 Interventions to Increase Village Poultry Productivity

The challenge is to identify interventions that could be implemented successfully into existing village scavenging production systems. Unfortunately, without village organisation, scavenging free range village poultry will remain susceptible to all the diseases and risks identified during the survey. Village poultry production will continue to be a high risk activity. A complete change in the production system to small scaled commercial enterprises is the main opportunity for any impact from poultry raising activities. This will be a process over time.

The impact of any proposed intervention will involve not only the biological response to the new technology, but also the resource base of the farming system. Prospective interventions will be sustainable only if they fit the limited physical and economic resources of farmers.

Almost all interventions in subsistence poultry keeping require cash inputs – albeit small. This means that villagers need to become more market orientated.

Where possible, poultry production should be moved from the immediate village area to the crop production area.

The introduction of exotic birds should not be encouraged until all levels of management, infrastructure and markets are of a standard where the results can be of benefit to the producer.

Focus should be on reducing hatch to 6 week old chick mortality and overall losses of birds of 6 weeks of age through to maturity.

There are a number of technical interventions that can significantly improve existing systems. They include:

1. Improved control of ND and FC.

- For free ranging poultry, health interventions will always be paramount. Vaccination against ND can increase survival rates dramatically. A constraint of vaccinations is that they have to be repeated at regular intervals, services are not available, and vaccines not available or reliable. These limitations may confound the applicability of this key intervention. Other interventions can be expected to have only limited success or success of some periods unless effective vaccination can be guaranteed.
- Community activities and organisation and training of farmers are required for the implementation of successful vaccination programmes.

2. Improved biosecurity.

- A process that prevents the transmission of disease between individual and groups of poultry should be encouraged.
- There needs to be a reduction in contact between birds through fencing and enclosures.
- Farmers need to invest in construction of chicken houses, troughs and nests must be cleaned regularly, and the poultry confined. This will in turn require that scavenging is no longer the feed source and farmers will also need to supply full feed requirements.
- Chickens should not be purchased from the markets or neighbouring villages at the times of the year when ND or FC outbreaks are more common.
- All sick and introduced birds need to be quarantined immediately.
- Where possible, poultry should be raised away from the confines of the village.

3. Supplementary feeding.

- The strategic supplementary feeding of poultry can have a marked impact on production and health status. Providing quality supplementary feed can be achieved by either purchasing commercial feed or harvesting locally available material.

- Commercial feed can be expensive or difficult to procure but rations made up of home grown feeds can ensure good returns in terms meat, eggs and fertility.
 - The establishment of small legume plots (e.g. *Arachis pinto*) can provide an excellent protein source.
 - Training should be provided to encourage farmers to formulate quality rations using local feed resources, what and how to feed their birds - especially laying/brooding hens and chicks up to two months of age - and timing and frequency of feeding.
 - The provision of creep feeding should be encouraged during the early growth period.
4. **Water.**
- Provision should be made for chickens to access clean fresh drinking water at all times. Poultry, especially young chicks and laying hens, will perform much better when provided with water. The provision of good quality water will also decrease the transmission of diseases such as FC.
5. **Housing and shelter.**
- All families provide shelter for their chickens and are aware of the importance of housing. What is needed is to encourage farmers to improve existing structures so that they realise greater benefits.
 - Elevated rodent protected, well ventilated houses with slats should be promoted
 - For small flocks, daytime moveable houses that enable birds to scavenge for feed each time the house is moved to a new position should be encouraged.
 - Simple perches should be constructed to allow birds to sleep off the ground and so minimise contact with dust, manure and worm eggs on the floor.
 - There should be provision of sufficient, clean, safe and secure nesting structures to control and improve productivity.
 - If feed and water is available, hens with young chicks should be provided with moveable daytime shelter. Such shelters will prevent most predators from being able to take the young chicks. If these cages are moved around to new areas each day, the chicks will also learn to scavenge so that they will be able to find feed easily once they are allowed to roam freely after reaching eight weeks of age.
6. **Flock management.**
- To obtain good breeding stock, farmers need to place more emphasis on their selection of hens and cocks. Selection means the separation of productive hens and well-sized active cocks.
 - Birds that are unsuitable for breeding should be sold as soon as they have reached a marketable weight.
 - Chicks should be confined with the hen for two weeks after hatch.
7. **Knowledge and information.**
- When new information is introduced which relates specifically to women's areas of work, it is particularly important to ensure that women are given control over this information. Since women dominate most of the activities around village poultry production, it is important to have an engendered approach in any village chicken improvement programme.

By adopting a holistic approach to village poultry development and taking into account organisational as well as technical aspects, it is possible within a relatively short period to improve existing village poultry production systems based on locally available resources. This may lead to poorer farmers developing their skills and creating a small but sustainable income with very few required inputs.

However, the critical element to the success of any village focused activity will be the necessity to better understand and appreciate existing individual village poultry practices and their social context. It should be understood that these will vary from location to location. Thus interventions

must be targeted to the requirements of the site. Once this is more clearly understood and defined, local farmer groups can be established. These poultry farmer focus groups must be made up of farmers who display a 'passion' for poultry and who feel involved and committed to the programme and its process. This will require close cooperation with all collaborating departments and community leaders who will need to maintain continual contact with and support to the focus farmer groups .

A successful approach to improving village poultry production is the Farming Systems Research (FSR) approach as illustrated in the flow chart in Figure 1.

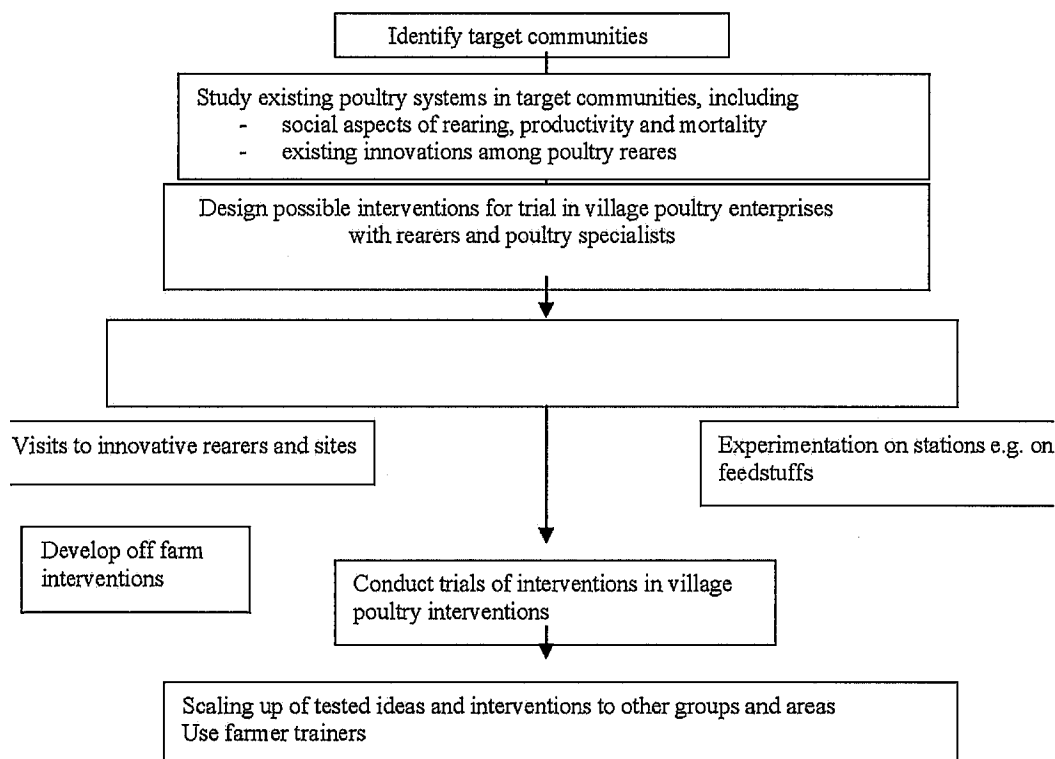


Figure 1 Farming systems approach to research + development of village poultry.
(Adapted from Petheram (1998) and Petheram and Clark - 1998).

Once the target communities and the description of existing poultry systems and their social context have been identified, the focus should be on the development of focus groups – those with the 'passion' - within and across the target villages. All households should be encouraged to take part in this process to define levels of productivity and profitability and the factors limiting them. Using participatory methods, those involved should be encouraged to share their views as to the constraints and opportunities to develop effective and acceptable interventions. This would be followed by a process of testing the different ideas for social acceptance and impact on productivity and profitability. Once identified, these would then lead to further on-farm testing of innovations within the target area. Following the impact assessment, those innovations that show significant positive impact could be promoted for further extension to other regions.

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Table 3.6 Technical options for intensifying livestock production

SYSTEM	Practice	Key interventions
PIG FATTENING IN PENS	1.1 Improve knowledge of diseases and their spread	<ul style="list-style-type: none"> • Diseases come into village with diseased animals and infected meat • Use housing to restrict contact between animals • Quarantine of new animals for 2-3 weeks • Provide good pen hygiene and water • Vaccinate piglets for CSF when they go into the pen for fattening, if feasible
	2.2 Smart feeding	<ul style="list-style-type: none"> • Ad. lib. feeding to ensure good growth • Encourage the use of fresh Stylo and encourage production and use of leaf meal • How much feed do different types of pigs need (quantity)? Ad-lib feeding for growing pigs. • Need better feed quality (need more protein) • How to help farmers to learn to formulate good feeds • Arrange 24 hour access to water (water nipples provide the cleanest water supply) • Improve trough design to minimise feed losses (narrow and deep to prevent spillage and stop pigs sitting in it). Also, divide the trough into individual access areas so small piglets have the same access to food as bigger pigs.
	<ul style="list-style-type: none"> • 1.3 Improved Stylo management 	<ul style="list-style-type: none"> • Encourage nutrient management (apply manure to Stylo plots to maintain productivity) • Need to re-sow Stylo plots after year 3 (use a different plot) • Produce seed of Stylo to be able to replant after 3 years or expand the area (or sell seed to other farmers).
	1.4 Housing, breeding and management	<ul style="list-style-type: none"> • Improve housing (thatched roof, slatted floor helps parasite control, big size to allow room for feeding and sleeping areas) • Strategic de-worming when pigs go into pen for fattening

SYSTEM	Practice	Key interventions
IMPROVED SOW-PIGLET PRODUCTION	2.1 Knowledge of diseases and their spread	<ul style="list-style-type: none"> • Diseases come into village with diseased animals and infected meat • Use housing to restrict contact between animals • Quarantine of new animals for 3 weeks • Provide good pen hygiene and clean water • Vaccination program for CSF, if possible
	2.2 Smart feeding	<ul style="list-style-type: none"> • Encourage the use of fresh Stylo and encourage production and use of leaf meal • Knowledge of how much feed do different types of pigs need? • Ad-lib feeding for growing pigs and lactating sows; restrict feeding of dry sows and boars. • Need better feed quality (need more protein) • How to help farmers to learn to formulate good feeds • Provide 24 hour access to water (water nipples provide the cleanest water supply) • Improve trough design to minimise feed losses (narrow and deep to prevent spillage and stop pigs sitting in it). Also, divide the trough into individual access areas so small piglets have the same access to food as bigger pigs.
	2.3 Improved Stylo management	<ul style="list-style-type: none"> • Encourage nutrient management (apply manure to Stylo plots to maintain productivity) • Need to re-sow Stylo plots after year 3 (use a different plot) • Produce seed of Stylo to be able to replant after 3 years, to expand or sell seed to other farmers
	2.4 Housing, breeding and management	<ul style="list-style-type: none"> • Improve housing (thatched roof, slatted floor helps parasite control, big size to allow room for feeding and sleeping areas) • Provide a farrowing pen to minimise mortality of piglets (provide straw/dry grass for the sow to build a nest; provide a creep area – a small box in corner of pen – which has a solid floor, roof and 3 walls with straw / dry grass for piglets to sleep in to keep warm). • Keep records on mating, births, deaths, weaning and score condition of animals) •Wean piglets early (60–75 days) to ensure that the sow comes back into condition quickly • Strategic de-worming (sow before going into farrowing pen)
		Manage breeding (avoid in-breeding, select good sows and boars)

SYSTEM	Practice	Key interventions
FATTENING / FINISHING of CATTLE +BUFFALO	3.1 Knowledge of diseases and their spread	<ul style="list-style-type: none"> • De-worm cattle when put into pen for fattening • Vaccination program for HS
	3.2 Smart feeding for improved productivity	<ul style="list-style-type: none"> • Ensure that cattle in fattening systems receive ad-lib. feed • Supplement forage legumes (and/or other high-protein feeds) to improve feed quality – e.g. use of stylo and tree legumes; fertilise grasses and feed young, leafy grass • Arrange 24 hour access to water • Improve trough design to minimise feed losses (deep and with head constrained to minimise pulling feed out of the trough) • Knowledge: What feed do different classes of animals need? Need to provide ad-lib feeding to maximise growth. Provide the best feed to cattle being fattened (give young grass and legumes) • Match production cycles with periods of good prices in the year
	3.3 Forage production	<ul style="list-style-type: none"> • Encourage nutrient management of forage plots (put manure back onto grass plots)
	3.4 Housing, breeding and management	<ul style="list-style-type: none"> • Improve pens in fattening systems to ensure good hygiene, easy collection of manure, and feed trough design to minimise losses • Ensure de-worming and eliminate external parasites of cattle going into pens for fattening • Do an economic analysis of fattening in Laos to show the extent of the benefits

SYSTEM	Practice	Key interventions
IMPROVED COW-CALF PRODUCTION	4.1 Knowledge of diseases and their spread	<ul style="list-style-type: none"> • Facilitate Toxocara treatment for buffalo calves • De-worming of cattle calves at age 3 months • Vaccination program for HS
	4.2 Smarter feeding for improved productivity	<ul style="list-style-type: none"> • Improve cow and calf condition by increasing the period of keeping the cow at the house before (2 weeks) and after birth (6 weeks). During this time provide ad-lib of young, leafy grass and legumes (or/and other protein sources), and ensure access to water for 24 hrs/day • Knowledge: How much and what kind of feed do different classes of animals need? Ad-lib feeding for all except dry cows and bulls for breeding. Provide the best feed to lactating cows (young grass, legumes)
	4.3 Forage production	<ul style="list-style-type: none"> • Improved nutrient management of forage plots (put manure back onto grass plots)
	4.4 Housing, breeding and management	<ul style="list-style-type: none"> • Control of breeding (bring Hmong bull to Lao Loum villages to improve breeding; castrate bulls not intended for breeding; separate different animal classes to facilitate management) • Keep records on mating, births, deaths, weaning and score condition of animals) • Manage breeding (avoid in-breeding, select good cows and bulls; consider culling of unproductive cows)

Table 3.7a Emerging models: Luang Prabang (Dec. 2006)

indicates animal health/management; **indicates isolated change**

Pak Ou District

Village/no. HH)	Livestock System	Intervention introduced and continued in 2006		Impacts	Interventions for further increase productivity	
	Ruminant	Ruminant	Pigs		Ruminants	Pigs
1) Hadd Paeng (68)	Breeding Fattening	+ Increase forage & legumes + Forage seed prod + Marketing of root stock + Sale of grazing	+ Increase in stylo area + Cassava & sweet potato use + Improved pen/hygiene (5 HHs) + Drinking water system & Improved feed troughs (5 HHs) + formulated feed rations + CSF vaccinations + Animal health rev. fund estab.	+ Income from sale of seed, cutting & grazing + Increase in animal nos. + Low mortality & morbidity + Shortened fattening period (pigs from 1yr to 6-8mths) + Increased Farmer knowledge + Improved cattle nutrition fatter animals + Saving in labour/time	+ Increase forage area + Improve cow/calf feeding & management + Early weaning & management of calves + Finishing animals with quality feed in pens + Scaling out + Increase stylo (protein), cassava, sweet potato area + Use local feed resources + Improve pens + Piglet production + Boar/sow selection + Animal movement control + Market awareness n/a	+ Increase stylo (protein), cassava, sweet potato area + Use local feed resources + Improve pens + Piglet production + Boar/sow selection + Animal movement control + Market awareness n/a
2) KokHan (13)	Breeding	n/a	n/a		+ Increase forage area + Improve cow/calf feeding & management + Early weaning & management of calves + Finish in pen +qual. feed + Calf de-worming + HS vaccinations	n/a
3) Phonsavanh (10)	Breeding	n/a	n/a	+ Improved cattle nutrition-fatter animals + Saving in labour/time	+ Increase forage area + Improve cow/calf feeding & management + Early weaning & management of calves + Finish in pen -qual. feed + Calf de-worming + HS vaccinations	n/a
4) Fay (24)	n/a	n/a	+ All pigs penned + Increase in stylo area + Cassava & sweet potato mix + Improved pen + Water & improved trough + formulated feed rations + Sludge + Vaccination/deworming/castration + Weighing & monitoring + Village quarantine + Animal health rev. fund estab. + Improved biosecurity	+ Shortened fattening period (pigs from 1yr to 6-8mths) + Improved biosecurity/No deaths recorded + Improve general health + More piglets born + More piglets weaned + Higher weaning weights + Saving in time/labor + Increased farmer knowledge & ability	n/a	+ Stylo seed production + Better utilization of local feed resources + Improve pen design/hygiene + Improving boar/sow/piglet + Scaling out + Market awareness

Pak Ou District (cont.)

Village/no. HH)	Live stock System		Intervention introduced and continued in 2006		Impacts	Interventions for further increase productivity	
	Ruminant	Pigs	Ruminant	Pigs		Ruminants	Pigs
5) Had Ya (16)	n/a	Piglet Production/ Fattening	n/a	+ Increase in stylo area + Porsaa utilization + Improved pen + Water & feed troughs + Silage making + Vaccination/deworming/ castration + Animal health rev. fund est. + Improved breeding (x breed)	+ Shortened fattening period (pigs from 1yr to 6-8 mths) + saving in time/labor + Improved health no death recorded + More piglets born + More piglets weaned + Higher weaning wt.	n/a	+ Stylo seed production + Better utilization of local feed resources + Improve pen design/hygiene + Improving boar/sow/piglet management + Animal movement control + Scaling out + Market awareness
6) Had Kham (22)	n/a	Piglet Production/ Fattening	n/a	+ Increase in stylo area + Porsaa utilization + Improved pen + Water & feed troughs + Silage making + Vaccination/deworming/ castration + Weighing & monitoring + Animal health rev. fund est. + Improved breeding (x breed)	+ Shortened fattening period (pigs from 1yr to 6-8 mths) + saving in time/labor + Improved health no death recorded + More piglets born + More piglets weaned + Higher weaning wt.	n/a	+ Stylo seed production + Better utilization of local feed resources + Improve pen design/hygiene + Improving boar/sow/piglet management + Animal movement control + Scaling out + Market awareness
7) Houay Phan	n/a	Fattening	n/a	+ Use of stylo – fresh & leaf meal + Improved pig house and troughs (4HH's) + Cassava root & leaf use + CSF vaccination + Animal health rev. fund est	+ Decrease in animal deaths + Shortened fattening period + saving in time/labor	n/a	+ Increase stylo & cassava + Use local feed resource + Improve pig housing/utilities/hygiene + Piglet production + Animal movement control + Deworming + Provision of water + Market awareness
8) Pak Chaek (3)	n/a	Fattening	n/a	+ Use of stylo – fresh & leaf meal + Improved pig housing + Water systems & improved feed troughs + CSF vaccination + Animal health rev. fund est.	+ Decrease in animal deaths + Shortened fattening period + saving in time/labor	n/a	+ Increase stylo & cassava + Use local feed resource + Improve pig housing/utilities/hygiene + Piglet production + Animal movement control + Deworming + Scaling out + Market awareness

Pak Ou District (cont.)

Village/no. HH)	Live stock System Ruminant	Pigs	Intervention introduced and continued in 2006 Ruminant	Pigs	Impacts	Interventions for further increase productivity Ruminants	Pigs
9) Houay Luang (3)	n/a	Fattening	n/a	+ CSF vaccination + Animal health rev. fund est.	+ Decrease in animal deaths	n/a	+ Increase stylo & cassava Planting area + Better utilization of local feed resources + Improve pig Housing/utilities/hygiene + Piglet production + Animal movement control + Deworming + Provision of water
10) Lattahae (4)	n/a	Fattening	n/a	+ Stylo planting & utilization + Improved housing (1HH) + Drinking water system (1HH) + CSF vaccination + Animal health rev. fund est.	+ Decrease in animal deaths + saving in time/labor	n/a	+ Increase stylo & cassava Planting area + Better utilization of local feed resources + Improve pig Housing/utilities/hygiene + Piglet production + Animal movement control + Deworming
11) Khon Kham (4)	n/a	Fattening	n/a	+ Stylo planting & utilization + Improved housing (1HH) + Drinking water system (1HH) + CSF vaccination + Animal health rev. fund est.	+ Decrease in animal deaths + saving in time/labor	n/a	+ Increase stylo & cassava Planting area + Better utilization of local feed resources + Improve pig Housing/utilities/hygiene + Piglet production + Animal movement control + Deworming
12) Somsanouk (6)	n/a	Piglet Production/ Fattening	n/a	+ All pigs penned + Stylo utilization + Improved pen + Improved feed troughs + Vaccination/deworming + Animal health rev. fund est. + Improved breeding (breed)	+ Shortened fattening period (pigs from 1yr to 6-8 mths) + saving in time/labor + Improved health + no death recorded + More piglets born – 2 litters/year + More piglets weaned + Higher weaning wt.	n/a	+ Extend stylo area + Better utilization of local feed resources + Boar management + Pen/utility/hygiene Improvement + Animal movement control + Scaling out + Market awareness

Luang Prabang District

Village/no. HH)	Live stock System		Intervention introduced and continued in 2006			Impacts	Interventions for further increase productivity	
	Ruminant	Pigs	Ruminant	Pigs			Ruminants	Pigs
1) Long Lan (4)	Breeding	Fattening	+ Expanded forage area + HS vaccinations + Calf deworming + Cows & calves brought closer to home for better feeding/ management	+ Move from extensive to semi intensive systems + establish & utilize stylo + Commence housing/utility programme + CSF vaccinations + Deworming + Weighing & monitoring	+ stronger and healthier calves + no calf deaths + no pig deaths + Improved weight gain + Saving in time/labour	+ Increase forage area + Improve cow/calf feeding & management + Early weaning & management of calves + Finishing animals with quality feed in pens	+ Better utilization of local feed resources + House/utility/hygiene improvement + Animal movement control + Provision of water + Market awareness	
2) Dan Savang (3)	Goat breeding/ Fattening	Fattening	+ Expanded forage area + Pen construction + Parasite control	+ Move from extensive to semi intensive systems + establish & utilize stylo + Commence housing/utility programme + CSF vaccinations + Deworming	+ stronger and healthier animals + no goat deaths + no pig deaths + Improved weight gain/quicker turnover + Saving in time/labour	+ Increase forage area + Improve housing + Buck/nanny management + Weaning + Castration	+ Use local feed resources + House/utility/hygiene improvement + Animal movement control + Provision of water + Market awareness	
3) Plk Noy (4)	Breeding	Fattening	+ Expanded forage area + HS vaccinations + Calf deworming	+All pigs penned + Vaccination/deworming + Improved feeding strategies	+ Improved buffalo nutrition-fatter animals + No deaths + Shortened fattening period + Saving in labour/time	+ Increase forage area + Improve cow/calf feeding & management + Early weaning & management of calves + Finishing animals with quality feed in pens	+ Better utilization of local feed resources + House/utility/hygiene improvement + Animal movement control + Provision of water + Market awareness	
4) Viengsavanh (9)	Goat breeding/ Fattening	Fattening	+ Expanded forage area + Pen construction + Parasite control + Orf (scabby mouth) control	+ House construction + Improved feeding & water trough design + Vaccination/deworming + Improved feeding strategies incl. use of cassava root & leaf	+ Improved buffalo nutrition-fatter animals + No deaths/healthier animals + Shortened fattening period + Saving in labour/time	+ Increase forage area + Improve housing + Buck/nanny management + Weaning + Castration	+ Increase stylo & cassava + Better utilization of local feed resources + Improve pig housing flooring/hygiene + Piglet production + Animal movement control + Market awareness	
5) Naddonkoun (6)	Breeding	n/a	+ Established forage area + Constructed holding pens	n/a	+ faster growth rates + Healthier animals + Saving in labour/time	+ Increase forage area + Improve cow/calf feeding & management + Early weaning & management of calves + Finishing animals with quality feed in pens + Vaccination/deworming	n/a	

Luang Prabang District (cont.)

Village/(no. HH)	Live stock System		Intervention introduced and continued in 2006		Impacts	Interventions for further increase productivity	
	Ruminant	Pigs	Ruminant	Pigs		Ruminants	Pigs
6) Muang Khai (1)	Breeding	n/a	+ Weed control in forage plot + HS Vaccination + Calf deworming + Pen upgrade	n/a	+ Able to feed animals well throughout year + Improved condition + No health problems + Saving in labour/time	+ Increase forage area + Improve cow/calf feeding & management + Early weaning & management of calves + Finishing animals with quality feed in pens	n/a
7) Nong Tok (13)	L.R. breeding Goat breed/ fattening	Piglet production/ Fattening	+ Weed control in forage plot + HS Vaccination + Calf & goat deworming + 12 mth cut & carry (2HHs) + Pen construction	+ Stylo establishment + CSF vaccination + Deworming + Weighing & monitoring	+ Able to feed animals well throughout year + Improved condition + Increased goat nos. + No health problems + Saving in labour/time	+ Increase forage area + Improve goat feeding, breeding & management + Billy goat castration + Improve goat housing + Early weaning & management of calves + Finishing animals with quality feed in pens	+ Use local feed resources + House/utility/hygiene improvement + Animal movement control + Piglet production + Boar/sow selection & management + Provision of water + Market awareness
8) Paksy (13)	Breeding	n/a	+ Established forage area + Weed control in forage plot + HS vaccination + Calf deworming + Improve c& c feeding system to better meet production cycle needs	n/a	+ Increase in animal nos. + Better conditioned animals + Improved health + Saving in labour/time	+ Increase forage area + Improve cow/calf feeding & management + Early weaning & management of calves + Finishing animals with quality feed in pens	n/a
9) Phavieng (9)	Breeding	Fattening	+ Forage plot expansion & management + HS vaccination + Holding pen construction (10HHs)	+ Stylo establishment + Plot maintenance + CSF vaccinations + Introduction to penning	+ Increase in cattle nos. + Improved feed supply + Better conditioned animals + Saving in labour/time + Incr. farmer knowledge on management	+ Increase forage area + Calf deworming + Improve cow/calf feeding & management + Early weaning & management of calves + Finishing animals with quality feed in pens	+ Better utilization of local feed resources + House/utility construction + Improved hygiene + Animal movement control + Deworming + Provision of water + Market awareness
10) Nasao (6)	L.R. breeding Goat breed/ fattening	n/a	+ Forage plot expansion & management + HS vaccination + c & c feeding (3 HHs) + Goat housing construction	n/a	+ Animals better conditioned + No deaths + Increase in goat nos. + Saving in labour/time + Increased farmer knowledge on management issues	+ Increase forage area + Improve goat feeding, breeding & management + Calf & goat deworming + Billy goat castration + Improve goat housing + Early weaning & management of calves + Finishing animals with quality feed in pens	n/a

Luang Prabang District (cont)

Village/no. HH)	Live stock System		Intervention introduced and continued in 2006			Impacts	Interventions for further increase productivity	
	Ruminant	Pigs	Ruminant	Pigs			Ruminants	Pigs
11) Phon Ngam (9)	Breeding	Fattening	<ul style="list-style-type: none"> + Forage plot management + Improve c & c system + Seed production (2 HHs) + Marketing of root stock + Pen/utility construction (1HH) + HS vaccination + Calf deworming 	<ul style="list-style-type: none"> + Established stylo and cassava plots + Pig house construction + CSF vaccination 		<ul style="list-style-type: none"> + Increased no. animals + Improved health/ fewer deaths + Improved growth rates / shortened fattening period (pigs from 1yr to 8mths) + Increased sale price + Saving in labour/time + Increased farmer knowledge on management issues + sale of rootstock 	<ul style="list-style-type: none"> + Increase forage area + Improve cow/calf feeding & management + Early weaning & management of calves + Finishing animals with quality feed in pens 	<ul style="list-style-type: none"> + Increase stylo & cassava area + Better utilization of local feed resources + House/utility construction + Improved hygiene + Animal movement control + Deworming + Provision of water + Market awareness
12) Kok Vanh (8)	Breeding	Fattening	<ul style="list-style-type: none"> + Forage expansion by root cutting + Forage plot management + HS vaccination + Calf deworming + c & c feeding (8 HHs) 	<ul style="list-style-type: none"> + Stylo & cassava establishment + Deworming + Pig house construction + Improved hygiene + Weighing & monitoring 		<ul style="list-style-type: none"> + Increased no. animals + Improved health/ fewer deaths + Improved growth rates + Saving in labour/time + Increased farmer knowledge on management issues 	<ul style="list-style-type: none"> + Increase forage area + Improve cow/calf feeding & management + Early weaning & management of calves + Finishing animals with quality feed in pens + Improved goat breeding + Billy goat castration + Improve goat housing 	<ul style="list-style-type: none"> + Increase stylo + Stylo seed harvesting + Better utilization of local feed resources + House/utility construction + Improve hygiene + Animal movement control + Provision of water + Market awareness

Xieng Ngeun District

Village/no. HH)		Live stock System		Intervention introduced and continued in 2006		Impacts	Interventions for further increase productivity	
		Ruminant	Pigs	Ruminant	Pigs		Ruminants	Pigs
1) Houay Hia (12)	Large Ruminant breeding/ Selling Goat breeding/ selling	Piglet production/ fattening	+ Forage plot expansion & management + Better management/ supplementary feeding with forages of cow/calf in pens close to home + Weaning @ 8 mths and preferential feeding of calf + Finishing cattle with forages for 2 mths + HS vaccination + Goats penned (5 HHs) + Goat/calf deworming	+ Use of fresh & dry stylo as a feed supplement (4 HHs) + Raised floor housing with improved feed & water troughs (2 HHs) + CSF vaccination + Deworming	+ Increased no. of all animals + Healthier animals + Fewer deaths + Improved growth rates/ animals sold at an earlier age + Increased farmer knowledge and ability on management issues + Saving in labour/time	+ Increased no. of all animals + Healthier animals + Fewer deaths + Improved growth rates/ animals sold at an earlier age + Increased farmer knowledge and ability on management issues + Saving in labour/time	+ Increase forage area + Selective breeding (c & g) + Castration (c & g) + Improve goat house design & construction + Weaning & pref. feeding of goats + Provision of water	+ Better utilization of local feed resources + House/utility/hygiene improvement + Animal movement control + Boar/sow selection + Improve boar/sow/piglet management + Provision of water + Market awareness
2) Phou Khoua (8)	Large ruminant breeding/ Selling	Piglet production/ fattening	+ Forage plot expansion & management + Animals tethered/ housed and fed forages during early lactation period + Calf deworming + Goat night housing (7HHs)	+ Pig House construction (5 HHs) + CSF Vaccination + Deworming + Water provision + Experimenting with stylo	+ Increased no. all animals + Healthier animals + Fewer deaths + Improved growth ability on management issues + Saving in labour/time + Renewed village interest in cattle raising	+ Increased no. all animals + Healthier animals + Fewer deaths + Improved growth ability on management issues + Saving in labour/time + Renewed village interest in cattle raising	+ Increase forage area + Early weaning & management of calves + Finishing animals with quality feed in pens + Provision of water	+ Increase stylo area + Better utilization of local feed resources + House/utility construction + Improved hygiene + Animal movement control + Provision of water + Market awareness
3) No. 11 (6)	Buffalo sale breeding/ draft	Piglet production/ fattening	+ Improved feeding prior to draft	+ Use of fresh & dry stylo as a feed supplement (6 HHs) + Pig house construction (4HHs) + CSF vaccination + Deworming <small>Source: The National Veterinary Research Institute, Phnom Penh, Cambodia</small>	+ Increased no. of all animals + Healthier animals + Fewer deaths + Improved growth ability on management issues + Saving in labour/time	+ Increased no. of all animals + Healthier animals + Fewer deaths + Improved growth ability on management issues + Saving in labour/time	+ Increase forage area + Penning & feeding c & c + Cow/calf management + HS vaccination + Calf deworming	+ Stylo seed production + Better utilization of local feed resources + Improve pen design/utilities/hygiene + Improving boar/sow/piglet management + Scaling out + Market awareness

Xieng Ngeun District (cont.)

Village/no. HH)	Live stock System		Intervention introduced and continued in 2006		Impacts	Interventions for further increase productivity	
	Ruminant	Pigs	Ruminant	Pigs		Ruminants	Pigs
4) Kiewtaloun/Vai(8)	Large ruminant breeding/selling Goat breeding/selling	n/a	+ Forage plot expansion & management + Animals tethered/ housed and fed c & c forages during early lactation period + HS vaccination + Goat housing/c&c (3 HHs) + Deworming goats	n/a	+ Increased income (3.2 – 8.5 m.kip/yr) + Increased no. of all animals + Healthier animals + Fewer deaths + Improved growth + Increased farmer knowledge and ability on management issues	+ Increase forage area + Early weaning & management of calves + Finish in pen – quality feed + Provision of water + Calf deworming + Castration (c & g) + Improve goat house + Weaning & pref. feeding of goats + Provision of water	n/a
5) HouayThao (8)	Extensive/ Free range Goat breeding/selling	Piglet production/ fattening	+ Low input upland free grazing + Housed goats – fed c & c + HS vaccination + Calf/goat deworming	+ Pig house construction (8h'h's) + Formulating rations (fresh & dry stylo, Luciana, Cassava, maize & rice bran – 2 HHs) + Piglet deworming + CSF vaccination	+ Increased no. of all animals + Healthier animals + Fewer deaths + Improved growth	+ Calf deworming + Increase forage area + Improve cow/calf feeding & management + Early weaning & management of calves + Finish in pens – quality feed + Improved goat breeding + Billy goat castration + Improve goat housing + Provision of water	+ Increase stylo area + Stylo harvesting + Better utilization of local feed resources + Improve pen design/utilities/hygiene + Market awareness
6) Silalek (6)	Extensive/ Free range	Piglet production/ fattening	+ Low input upland free grazing + Calf deworming	+ Raised floor pig housing + Penned animals (5 HHs) + Formulating rations (fresh & dry stylo, Luciana, Cassava, maize & rice bran – 2 HHs) + CSF vaccination + Deworming & weighing	+ Incr. no. of animals + Healthier animals + Fewer deaths + Improved growth + Saving in labour/time	+ Improve cow/calf feeding & management + Early weaning & management of calves + Finishing animals with quality feed in pens + Provision of water	+ Increase stylo area + Better utilization of local feed resources + Boar/sow selection + Improve pen design/utilities/hygiene + Market awareness
6) No 10 (8)	Extensive/ Free range	Piglet production/ fattening	+ Low input upland free grazing	+ Stylo & porsa utilization (8 HHs) + Raised floor pig housing (8HHs) with improved feeding troughs + Improved boar selection and supply service + CSF vaccination + Deworming + Poultry management/health/ housing/hygiene/breed/training	+ Shortened fattening period (pigs from 1yr to 6-8mts) + Improved general health + More piglets born + Higher weaning weights + Saving in time/labour	+ Increase forage area + Improve cow/calf feeding & management + Early weaning & management of calves + Finishing animals with quality feed in pens + Provision of water + Calf deworming	+ Increase stylo area + Better utilization of local feed resources + Improve pen utilities & water supply + Improving boar/sow/piglet management + Animal movement control + Scaling out + Market awareness

Xieng Ngeun District (cont.)

Village/no. HH)	Live stock System	Intervention introduced and continued in 2006	Impacts	Interventions for further increase productivity
	Ruminant	Pigs		Ruminants
8) Phonsavang (8)	Buffalo sale breeding/ draft	Piglet production/ fattening	<ul style="list-style-type: none"> + Buffalo stronger and in better condition for draft + Cows improved milking ability + No animal deaths + Healthier animals + Improved growth 	<ul style="list-style-type: none"> + Increase stylo area + Piglet deworming + Better utilization of local feed resources + Improve pen utilities & water supply + Boar/sow selection + Improve boar/sow/piglet management
9) Phonsaath (16)	Buffalo sale breeding/ draft	Piglet production/ fattening	<ul style="list-style-type: none"> + Increased no. of all animals + Improved sale price + Healthier animals + Fewer deaths + Improved cow milking ability + Improved growth + Increased farmer knowledge and ability on management issues + Saving in labour/time 	<ul style="list-style-type: none"> + Increase stylo area + Better utilization of local feed resources + Improve pen design/utilities/hygiene & water supply + Improving boar/sow/piglet management + Scaling out + Market awareness
10) Kiewmaknao (8)	Extensive/ Free range	Piglet production/ fattening	<ul style="list-style-type: none"> + Healthier animals + Fewer deaths + Improved sales 	<ul style="list-style-type: none"> + Increase stylo area + Better utilization of local feed resources + Improve pen design/utilities/hygiene & water supply + Improving boar/sow/piglet management + Deworming
11) Kiewya (11)	Extensive/ Free range	Piglet production/ fattening	<ul style="list-style-type: none"> + Healthier animals + Fewer deaths + Improved growth 	<ul style="list-style-type: none"> + Increase stylo area + Better utilization of local feed resources + Improve pen design/utilities/hygiene & water supply + Improving boar/sow/piglet management + Deworming

Table 3.7b Emerging models consolidating in mentor districts (Y2007)

Site	Ruminants																				
	Raising	Breeding			Fattening				Piglet (HH)	1	2	3	Fatten (HH)	1	2	3					
		Breeding (HH)	Intensification			HH fatten	1	2									3	Raising (HH)			
			1	2	3																
Pak Ou																					
HatPang									38							38				6	
PhonSaVang																					
KhokHan																					
HuayMak																				0	
Fai																				31	
SomSaNook									3				6	3						3	
HatKham													4							32	
HatYa									0				11							5	
PhaThing									10					10						8	
HuayLae									23					23							
Xieng Ngeun																					
KiewMakNao									5			5									
HuayThao									3			3									
PhonSaAt								3					5			3					
KiewYa							1							5		5				5	
HuaHier							5	3	3		3	3		55		5	10	15		10	
No.11							7							24		1	2	6		2	
PhuKoa							1	1	1	1		1		45		14	14	18	14	1	14
PhonSaVang							1	1	2		2			6		6					
SylLaLak							6	1						6		4					
KiewTalounYa							9	9	1		1	1		10							
No 10																		11		11	

	Raising (HH)	Breed (HH)	1	2	3	Fatten (HH)	1	2	3	Raising (HH)	Piglet (HH)	1	2	3	HH fatten	1	2	3
Pack																		
ViengKhouan				14											14			
PhonThong															39			39
Mon				29				2	4						29			29
SyMuang															13			9
Vieng				13				1							13			13
Ta																		0
OrAn																		0
Lao				25				11							21			21
PhonKham				3										3				17
Xang																		
DuXang				22				22										22
YabSy				7														7
Phone				20														20
NaKhouan				11											11			11
NaKhamPhang								31										
Mee				31													31	31
Lat hin								38	1									38
Khangdon																		29
Mieng				37				31	3									31
Perb								66										66
Dong				5														5
By								53										50
NaLam				36					1									26
PaKham									6						9			0
NaSaLa									7						9			0
Mouan								5							17			

	HH raising ruminant	HH breed	1	2	3	HH fatten	1	2	3	HH raising pigs	HH piglet	1	2	3	HH fatten	1	2	3
Nong Het																		
NamKoung										6								
NongLae										0								
ThamThoum										19								
SanDon. A										18								
PaHok						20				13								
PhaMao										7								
ThamKhu										11								
NongOr										8								
SanYom										21								
PhaPong										8								
PhaPher										9								
HuayKhyLing										4								
Thapsus										6								
KorHat																		
KeoPaToo										15								
PhouHoaxang										8								
NongKhiao										5								
YotKhor										6								
NongKob						9				11								
KorMon										8								
KorThong										5								
KhokMoo						7				9								
PhaAn						28				12								
KhangPhaNien						10				7								

ANNEX 4. CAPACITY BUILDING INPUTS

Table 4.1 Inception Workshop (29-30 Dec. 2005)

List of Participants

No	Name	Position	Organization
1	Souryasack Chayavong	National Project Director	DLF
2	Sithong Phiphakkhavong	EU Coordinator	DLF
3	Viensavanh Phimpachanhvongsod	Deputy Director	Livestock research Center
4	Phonepaseuth Phengsavanh	CIAT L4PP NPD	Livestock Research Center
5	Bounthavong Kounnavongsa	Researcher / PC	Livestock Research Center
6	Viengsay Photakoun	Deputy Director	Nat. Livestock Extension Center
7	Gnungthong Sihanath	Director	Nat. Livestock Extension Center
8	Chansom Manithong	Project Adviser	RDMA-, Bokeo Province
9	Khammy Philakone	Technical	RDMA-, Bokeo Province
10	Amone Khamlathanom	Project Coordinator	RDMA-, Bokeo Province
11	Bualy Phommachanh	Head Livestock Section	Bokeo Province
12	Phemphuang Tannasack	DAFEO Head	Pha Oudom District
13	Lamphoun Chanthalangthong	DAFEO Head	Viengxay District
14	Venvongphet	Manager	WCS
15	Khamnoy	Head, Livestock Section	Xamneua
16	Khampanh Suvanhphone	Deputy Head of DAFEO	Viengthong District
17	Cher Santisouk	DAFEO Head	Vieng Phoukha District
18	Chemnakhone	Deputy Head	Livestock Section, PAFO
19	Saykham Somvang	Head of Project	Namha Watershed Project
20	Khamphone Somsanguan	Project Coordinator	Namha Watershed Project
21	Somboun Sonelithideth	DAFEO Head	Khoun District
22	Khamsay Ouankhamchanh	DAFEO Head	Paek District
23	Vandy Buddavongsy	Head	Agro-Forestry Extension Div.
24	Sin	Head of Livestock Unit	Perk District
25	Khamphay Phommavong	Technical	Livestock Section, PAFO
26	Khampheui Sulichanh	Deputy Head	Livestock Section, PAFO
27	Kao Yang	Head of Livestock Unit	Nong Het District
28	Manisone	Deputy Head of DAFEO	Nong Het District
29	Thongbay	Head of Livestock Unit	Luang Prabang District
30	Sommay khonesavanh	DAFEO Head	Luang Prabang District
31	Bounmaly	DAFEO Head	Xiengneun District
32	Kaysone Vongkhampheng	Agro Forestry Div, Head	PAFO
33	Somvanh	Technical	Xiengneun District
34	Thongkham Vongphalath	Technical	Pak Ou District
35	Bounchanh Thilasack	DAFEO Head	Pak Ou District
36	Phonsay Vannadeth	DAFEO Head	Pak Seng District
37	Khamsy Chaleunthong	DAFEO Head	Phonsay District
38	Sengpasith Thongsavath	Head, Livestock Section	PAFO
39	Bounthanh Keobualapha	Deputy Director of PAFO	PAFO
40	Seng Amphone	Secretary	PAFO
41	Souldeth Phaphonsay	Technician	PAFO, Livestock section
42	Chemsay Tangseksanh	Project Coordinator	CONCERN WORLDWIDE
43	John Connell	Project Adviser	CIAT
44	Michel Handlos	Project Adviser	EU
45	Michel Janseven	Project Adviser	GTZ

Workshop Program Program

Time	Session	Facilitator
Thursday 29th December 2005		
08:00 – 12:00	Field trip - Village with intensification of Livestock	Old FLSP staff
12:00 – 13:00	Lunch	
13:00 – 13:30	Registration	Souriyasack
13:30 – 15:00	1. Introduction to Project - Purpose of project - Expected results (mentor sites and trainee sites) - Linkage with other projects (EU, SADU, FLSVP, GPAR, ADB, RDMA, ...) - Discussion	
15:00 – 15:15	Tea / Coffee break	Viengsavanh
15:15 – 16:30	2. Opportunities / challenges for Livestock development - Livestock keepers → Livestock producers (Role of forages) - Livestock producers → good livestock producers (enhance technologies) - Challenges: systems change /mindset changes - Development of market orientation + service providers - Discussion	
Friday 30th December 2005		
08:30 – 10:30	3. Fast-tracking Capacity Building - Three inputs: - Workshops - Mentors - Administration - Discussion	John Connell
10:30 – 10:45	Tea / Coffee break	
10:45 – 12:00	4. Establishment of Project - Selection of staff - Selection of pilot sites / expansion for NRSLLDP - Establishment of nurseries - Project resources / budget	Souriyasack
12:00 – 13:30	Lunch	
13:30 – 15:00	5. Workplan for 2006 - Activities - Opportunities	Phonepaseuth
15:00 – 15:15	Tea / Coffee break	
15:15 – 16:55	Presentation of Participated Projects	
16:55 – 17:00	Closing	

Table 4.2 Trainee Workshop T1 (March 10-18, 2006)

List of Participants

No	Name	Position	Organization
1	Bouakham Pheangsakta	Technician	Phonexay DAFEO
2	Chemnakhon Phaychit	Deputy head	Livestock Section
3	Amphay Phounmanolad	Head of Livestock Unit	Viengxay DAFEO
4	Kingkeo Thammavong	Technician	Khoun DAFEO
5	Seahlor Leefoung	Technician	CRWRC
6	Phaysouk Phouthapangna	Technician	Viengthong DAFEO
7	Samthong Khammeunkhoune	Technician	Viengthong DAFEO
8	Khambay Bounmy	Technician	Viengthong DAFEO
9	Vatthana Kongsana	Technician	Vieng Phoukha DAFEO
10	Inpanh	Technician	Vieng Phoukha DAFEO
11	Somchith Vongpadith	Technician	Phonexay DAFEO
12	Amphone Thongphovong	Technician	Viengxay DAFEO
13	Souliphone Inthaphone	Technician	Khoun DAFEO
14	Theuane Phanavonexay	Technician	CONCERN, Houayxay
15	Nasavad Sakhounkham	Technician	Vieng Phoukha DAFEO
16	Phetsoulaphone Chousathith	Technician	CONCERN, Houayxay
17	Khamphone Sysengchan	Technician	Namha Watershed Project
18	Sythong Vannavong	Technician	Namha Watershed Project
19	Sommvang Xaythor	Technician	Viengxay DAFEO
20	Soudaphone Latsamy	Technician	Phonexay DAFEO
21	Chai Phomphet	Technician	Viengxay DAFEO
22	Soulinxay Phongsavad	Technician	Viengthong DAFEO
23	Chanthaphone Phanthadee	Technician	Khoun DAFEO
24	Phadphilom	Technician	Khoun DAFEO
25	Leejar Xayvinou	Deputy Head	Livestock Section
26	Singthong Souliga	Cooperation Unit	PAFO
27	Khenchanh Pinthip	Deputy Head	Livestock Section
28	Houuvang Thongseng	Technician	Phonexay DAFEO
29	Malaykham Douangdara	Research assistant	WCS
30	Toh Xaygnavong	Technician	Pha Oudom DAFEO
31	Bounngee Chanthaboud	Technician	Pha Oudom DAFEO
32	Khammang Manieane	Technician	Pha Oudom DAFEO
33	Bounkhong Thaveesith	Technician	Pha Oudom DAFEO
34	Souldeth Phaphonxay	Technician	Livestock Section
35	Khamphay Phommavong	Technician	Livestock Section
36	Keo Anong Sipaseurth	Technician	Peak DAFEO
37	Sengpasith Thongsavath	Head	Livestock Section
38	Soukannga Chandeng	Administrator	CIAT
39	Souriyasack Chayavong	Deputy head, Plan. Div./ NPD	DLF
40	Nilan Somvichith	Technician, Planning Division	DLF
41	Bounthavong Kounnavongsa	Researcher / PC	Livestock Research Center
42	Phonepaseuth Phengsavanh	CIAT Regional Coordinator	Livestock Research Center
47	Gavin Varney	Project Adviser	CIAT

WORKSHOP PROGRAM

Date, Time	Session	Facilitator
10/3/2006	Day - 1	
8:00-8:30	Registration	Soukannga, Nilan
8:30-9:00	Opening Remark	Souriyasack, Gavin
9:00-9:15	Coffee / Tea break	
9:15-12:00	Introduction to Capacity Building for smallholder Livestock system project	Souriyasack
12:00-13:30	Lunch	
13:30-15:00	History of Forage Research and Forage extension in Lao PDR	Phonepaseuth
15:00-15:30	Coffee / Tea break	
15:30-16:30	Forage and important role of Forage	Phonepaseuth
11/3/2006	Day - 2	
8:00-9:45	The adopted Forage type Selection to natural environment al of regions in Lao PDR	Phonepaseuth, Sengpasith
9:45-10:00	Coffee / Tea break	
10:00-12:00	Forage planting	Phonepaseuth, Soukannga
12:00-13:30	Lunch	
13:30-15:00	Forage Management and Forage Use for animal	Phonepaseuth
15:00-15:30	Coffee / Tea break	
15:30-16:30	Forage Management and Forage Use for animal (Cont'.)	Phonepaseuth
12/3/2006	Day - 3	
8:00-9:45	The methodology of technological development with farmers	Viengsay
9:45-10:00	Coffee / Tea break	
10:00-12:00	The Basic of Communication to farmers	
12:00-13:30	Lunch	
13:30-15:00	The Basic of Communication to farmers (Cont'.)	Viengsay
15:00-15:30	Coffee / Tea break	
15:30-16:30	The Basic of Communication to farmers (Cont'.)	Viengsay
13/3/06	Day 4	
	Break	
14/3/2006	Day - 5	
	Practicing of General PD in 2 villages Xieng Khouang	Phonepaseuth,
15/3/2006	Day - 6	Souriyasack
8:00 – 9:00	Review of Practicing of General PD in 2 villages	Keoanong, Soulideth, Sengpasith, Khamphay,
9:00-9:15	Coffee / Tea break	
10:00-12:00	Specific PD Operation	Phonepaseuth, Keoanong, Soulideth, Sengpasith, Khamphay
12:00-13:30	Lunch	

13:30-15:00	Specific PD Operation (Cont'.)	Phonepaseuth, Keoanong, Soulideth, Sengpasith, Khamphay
15:00-15:30	Coffee / Tea break	
15:30-16:30	Preparing of Specific PD Operation	Phonepaseuth, Keoanong, Soulideth, Sengpasith, Khamphay
16/3/2006	Day - 7	
	Practicing of Specific PD in 2 villages	Phonepaseuth, Keoanong, Soulideth, Sengpasith, Khamphay, Souriyasack
17/3/2006	Day - 8	
8:00-9:45	Participatory Diagnosis 1. The Importance of PD Review of Practicing of Specific PD in 2 villages	Phonepaseuth, Keoanong, Soulideth, Keoanong, Soulideth, Sengpasith, Khamphay
9:00-9:15	The Preparing of PD Operation Coffee	Sengpasith, Khamphay
9:45-1000	Coffee / Tea break	
1010 -1200	Planning of District staff for CBSLSP	Sengpasith, Khamphay
10:00-12:00	The Preparing of PD Operation (Cont'.)	Phonepaseuth, Souriyasack
12:00-13:30	Lunch	Keoanong, Soulideth,
13:30-15:00	Planning of District staff for CBSLSP (Cont'.)	Sengpasith, Khamphay-
12:00-13:30	Lunch	Souriyasack
13:30-15:00	3. General PD Planning of District staff for CBSLSP (Cont'.)	Phonepaseuth, Keoanong, Soulideth, Sengpasith, Khamphay Souriyasack
15:30-16:30	Planning of District staff for CBSLSP (Cont'.)	Sengpasith, Khamphay
15:00-15:15	Coffee / Tea break	Souriyasack
15:15-16:30	3. General PD (Cont'.)	Phonepaseuth,
18/3/2006	Day - 9	-
	The meeting between Luang Prabang mentor team	Khamphay-Sengpasith, Soulideth
	Bokeo Luang Namtha Trainee teams	Souriyasack
19/3/2006	Day - 10	
	Bokeo, Luang Namtha Trainee teams travel to their home town	Sengpasith, Khamphay,
	The meeting between Xieng Khouang mentor team and	Souriyasack-Keoanong, Khamphay

Table 4.3 Trainee Workshop T2 (Oct. 24 – 28, 2006)

List of Participants

No	Name	Position	Organization
	Mr. Somphanh Chanphengxay	DDG	DLF
	Mr. Souriyasack Chayavong	Project Coordinator	DLF
	Mr. Bounthavong Khounnavongsa	Technical Support	NAFRI
	Mr. Viengxay Photakhoun	Technical Support	contract
	Mr. Nurakhom Thepphanid	Technical Support	contract
	Mr. Viengsuk Lorbiayao	Technical Support	contract
	Mr. Thongkham Vongphalad	Technical Support	contract
LUANG PRABANG			
	Mr. Sengprasith Thongsavath	Provincial Coordinator	Luang Prabang
	Mr. Soudaphone Rasamee	Technician	Phonexay
	Mr. Khamchar Keudnidkhammany`	Technician	Phonexay
	Ms. Somchith Vongpadith	Technician	Phonexay
	Ms. Bouakham Pheangsakta	Technician	Phonexay
XIENG KHOUANG			
	Mr. Khampai Phommavong	Provincial Coordinator	Xieng Khouang
	Mr. Phatphilom Keobouaphanh	Technician	Khoun
	Mr. Chanthaphone Phanthady	Technician	Khoun
	Mr. Soulipphon Inthaphone	Technician	Khoun
	Mr. Kingkeo Thammavong	Technician	Khoun
HOUAPHANH			
	Mr. Leejar Xayvinou	Provincial Coordinator	Houaphanh
	Mr. Amphay Phounmanolad	Technician	Viengxay
	Mr. Amphone Thongphouvong	Technician	Viengxay
	Mr. Somvang Xaythor	Technician	Viengxay
	Ms. Chai Phomphet	Technician	Viengxay
	Ms. Anousone Khammouenkhoun``	Technician	Viengthong
	Ms. Phaysouk Phouthapannga	Technician	Viengthong
	Ms. Phouangchanh Phomphet```	Technician	Viengthong
	Mr. Soulinxay Phongsavat	Technician	Viengthong
BOKEO			
	Mr. Singthong Sounga	Provincial Coordinator	Bokeo
	Ms. Bouatip Inthapanya ````	Technician	Pha Oudom
	Mr. Toh Xaynavong	Technician	Pha Oudom
	Mr. Khammang Manieane	Technician	Pha Oudom
	Mr. Bounkhong Thaveesith	Technician	Pha Oudom
LUANGNAMTHA			
	Ms. Chemnakhone Phaychid	Provincial Coordinator	Luang Namtha
	Ms. Samouan Adphasouk	Technician	Vieng Phoukha
	Mr. Nasavath Sakhounkham	Technician	Vieng Phoukha
	Mr. Vatthana Kongsanah	Technician	Vieng Phoukha
	Mr. Inpanh Vannakham	Technician	Vieng Phoukha

Workshop PROGRAM

Time	Session	Facilitator
Oct 24	REVIEW OF FORAGE ESTABLISHMENT AND USE	
AM	<ul style="list-style-type: none"> - Introduction and objectives of workshop - Establishment of nurseries - site selection, maintenance, use - Establishment of farmers plots - selection, planting, maintenance. 	Souriyasack and Bounthavong
PM	<ul style="list-style-type: none"> - Farmers use of forages - harvesting; preparation; feeding - Effectiveness of mentoring -Trips to 'old'; trips to 'new' ; monthly meeting - Summary and future directions Preparation for study trip 	John and Souriyasack
Oct 25	STUDY TRIP	
AM	<ul style="list-style-type: none"> - Group 1 - Fattening of cattle (Nong Het) - Group 2 – Fattening of pigs (Nong Het) - Group 3 – fattening of cattle (Paek) 	Team
PM	<ul style="list-style-type: none"> - Reporting - Farmers management of forage plots - Use and preparation of feed - Effect on livestock condition - Benefits to household 	John and Souriyasack
Oct 26	BASIC IMPROVED PIG PRODUCTION	
AM	<ul style="list-style-type: none"> - Feed quantity requirements for growth - Feed quality requirements / local sources - Feed requirements over lifecycle 	Viengxay
PM	<ul style="list-style-type: none"> - Better management of pigs (penning) - Animal Health issues - De-worming procedures 	Viengxay and Souriyasack
Oct 27	BASIC IMPROVED CATTLE / BUFFALO PRODUCTION	
AM	<ul style="list-style-type: none"> - Feed quantity requirements for growth - Feed quality requirements / local sources - Feed requirements over lifecycle 	Viengxay
PM	<ul style="list-style-type: none"> - Better management of pigs (penning) - Animal Health issues - De-worming procedures 	Viengxay ad Souriyasack
Oct 28	EXTENSION METHODS	
AM	<ul style="list-style-type: none"> - Follow-up: indicators of livestock condition - Expansion: <ul style="list-style-type: none"> o Dialogue with focus farmers o Focus group meeting o Village feed-back meeting 	John and Viengxay
PM	<ul style="list-style-type: none"> - Workplan outline - Summary 	Viengxay and Bounthavong

Table 4.4 Trainee Workshop T3 (Feb. 22-26, 2007)

List of Participants

No	Name	Position	Organization
	Mr. Souriyasack Chayavong	Project Coordinator	DLF
	Mr. Bounthavong Khounnavongsa	Technical Support	NAFRI
	Dr. Phut	Veterinarian/trainer	DLF
	Mr Phonepaseuth	Scientist/trainer	NAFRI
	Mr. Viengxay Photakhoun	Technical Support	contract
	Mr. Nurakhom Thepphanid	Technical Support	contract
	Mr. Viengsuk Lorbriayao	Technical Support	contract
	Mr. Thongkham Vongphalad	Technical Support	contract
LUANG PRABANG			
	Mr. Sengprasith Thongsavath	Provincial Coordinator	Luang Prabang
	Mr. Soudaphone Rasamee	Technician	Phonexay
	Mr. Khamchar Keudnidkhammany`	Technician	Phonexay
	Ms. Somchith Vongpadith	Technician	Phonexay
	Ms. Bouakham Pheangsakta	Technician	Phonexay
XIENG KHOUANG			
	Mr. Khampai Phommavong	Provincial Coordinator	Xieng Khouang
	Mr. Phatphilom Keobouaphanh	Technician	Khoun
	Mr. Chanthaphone Phanthady	Technician	Khoun
	Mr. Soulipphon Inthaphone	Technician	Khoun
	Mr. Kingkeo Thammavong	Technician	Khoun
HOUAPHANH			
	Mr. Leejar Xayvinou	Provincial Coordinator	Houaphanh
	Mr. Amphay Phounmanolad	Technician	Viengxay
	Mr. Amphone Thongphouvong	Technician	Viengxay
	Mr. Somvang Xaythor	Technician	Viengxay
	Ms. Chai Phomphet	Technician	Viengxay
	Ms. Anousone Khammouenkhoun``	Technician	Viengthong
	Ms. Phaysouk Phouthapannga	Technician	Viengthong
	Ms. Phouangchanh Phomphet````	Technician	Viengthong
	Mr. Soulinxay Phongsavat	Technician	Viengthong
BOKEO			
	Mr. Singthong Soulna	Provincial Coordinator	Bokeo
	Ms. Bouatip Inthapanya ````	Technician	Pha Oudom
	Mr. Toh Xaygnavong	Technician	Pha Oudom
	Mr. Khammang Manieane	Technician	Pha Oudom
	Mr. Bounkhong Thaveesith	Technician	Pha Oudom
LUANGNAMTHA			
	Ms. Chemnakhone Phaychid	Provincial Coordinator	Luang Namtha
	Ms. Samouan Adphasouk	Technician	Vieng Phoukha
	Mr. Nasavath Sakhounkham	Technician	Vieng Phoukha
	Mr. Vatthana Kongsanah	Technician	Vieng Phoukha
	Mr. Inpanh Vannakham	Technician	Vieng Phoukha

Workshop Program

Time	Session	Facilitator
Thursday, 22 February 2007		
08:00 – 08:30	Registration	Organizer
08:30 – 08:45	Introduction the purpose of the workshop-training	Organizer
08:45 – 09:00	Opening Ceremony	PAFO / LPB
09:00 – 09:15	Brief of CBSLSP	CBSLSP / DLF
09:15 – 09:30	Brief of SULDP	SLDP / DLF
09:30 – 09:45	Break	All participants
09:45 – 12:00	Review of CBSLSP 2006 (BK and LNT) + Discussion	Provincial Representatives
12:00 – 13:30	Lunch	All participants
13:30 – 15:00	Review of CBSLSP 2006 (HP and XKH) + Discussion	Provincial Representatives
15:00 – 15:15	Break	All participants
15:15 – 16:00	Review of CBSLSP 2006 (LPB) + Discussion	Provincial Representatives
16:00 – 16:30	Sum up of the first day meeting	Secretariat
Friday, 23 February 2007		
08:00 – 10:00	Pig production system: 1. Type of pig production system <ul style="list-style-type: none"> Define existing pig production in Nth Lao Present suggested production system types Finalize type of production systems in each district 	Dr. Phonepaseuth Dr. Phuth Mr. Viengsouk, Miss Chansouk
10:00 – 10:15	Break	All participants
10:15 – 12:00	2. Constraints and opportunities of each production system <ul style="list-style-type: none"> Define the existing constraints and opportunities in each production system Summarize the common constraints and opportunities 	Dr. Phonepaseuth Dr. Phuth Mr. Viengsouk, Miss Chansouk
12:00 – 13:30	Lunch	All participants
13:30 – 15:00	Pig production system (cont'): 3. Interventions and improvements of existing production systems <ul style="list-style-type: none"> The entry point and steps for working with farmers to improving the production systems Presentations on feed and basic nutrition, management, health, breeding, housing 	Dr. Phonepaseuth Dr. Phuth Mr. Viengsouk, Miss Chansouk
15:00 – 15:15	Break	All participants
15:15 – 16:30	<ul style="list-style-type: none"> What can be done to improve feed and feeding, management, health, breeding, housing systems in each district. Each district presents the proposed ideas plan 2007. 	Dr. Phonepaseuth Dr. Phuth Mr. Viengsouk, Miss Chansouk
Saturday, 24 February 2007		
08:00 – 10:00	Cattle and Buffalo production system: 4. Type of pig production system <ul style="list-style-type: none"> Define existing pig production in Nth Lao Presentation of suggested production system types Finalize type of production systems in each district 	Dr. Phonepaseuth Dr. Phuth Mr. Viengsouk Miss Chansouk

10:00 – 10:15	Break	All participants
10:15 – 12:00	5. Constraints / opportunities each production system <ul style="list-style-type: none"> Define the existing constraints and opportunities in each production system Summarize the common constraints and opportunities 	Dr. Phonepaseuth Dr. Phuth Mr. Viengsouk Miss Chansouk
12:00 – 13:30	Lunch	All participants
	Cattle and Buffalo production system (cont'): 6. Interventions and improvements of existing production systems <ul style="list-style-type: none"> The entry point and steps for working with farmers to improving the production systems Presentations on feed and basic nutrition, management, health, breeding, housing 	Dr. Phonepaseuth Dr. Phuth Mr. Viengsouk Miss Chansouk
	Break	All participants
	<ul style="list-style-type: none"> What can be done to improve feed and feeding, management, health, breeding, housing systems in each district. Each district presents the proposed ideas plan 2007. 	Dr. Phonepaseuth Dr. Phuth Mr. Viengsouk Miss Chansouk
Sunday, 25 February 2007		
08:00 – 10:00	Extension: <ol style="list-style-type: none"> Review of Village selection and PD Status of the working sites Farmers' group and Village meetings Collaboration with organizations and authorities 	Mr John Connell Mr. Souriyasack Mr. Bounthavong
10:00 – 10:15	Break	All participants
10:15 – 12:00	Discussion on the extension: <ol style="list-style-type: none"> Review of Village selection and PD Status of the working sites Farmers' group and Village meetings Collaboration with organizations and authorities 	Mr John Connell Mr. Souriyasack Mr. Bounthavong
12:00 – 13:30	Lunch	
13:30 – 15:00	Mentoring: <ol style="list-style-type: none"> Review of the CBSLSP mentoring in 2006 Farmers plot establish Impact Mentoring arrangements 	Mr John Connell Mr. Souriyasack Mr. Bounthavong
15:00 – 15:15	Break	All participants
15:15 – 16:30	Discussion on the mentoring: <ol style="list-style-type: none"> Review of the CBSLSP mentoring in 2006 Farmers plot establish Impact Mentoring arrangements 	Mr John Connell Mr. Souriyasack Mr. Bounthavong
Monday, 26 February 2007		
08:00 – 12:00	Planning for 2007 District teams prepare their activities and plan 2007	Mr John Connell Mr. Souriyasack
12:00 – 13:30	Lunch	All participants
13:30 – 16:30	Planning for 2007 Approval the district activities and plan 2007	Mr John Connell Mr. Souriyasack
Tuesday, 27 February 2007		
	Leaving for hometown	All participants

Table 4.5 Trainee Workshop T4 (Oct. 18 – 21, 2007)

List of Participants

No	Name	Position	Organization
	Mr. Souriyasack Chayavong	Project Coordinator	DLF
	Mr. Bounthavong Khounnavongsa	Technical Support	NAFRI
	Mr. Phonepaseuth	Scientist/trainer	NAFRI
	Mr. Viengxay Photakhoun	Technical Support	contract
	Mr. Nurakhom Thepphanid	Technical Support	contract
	Mr. Viengsuk Lorbrayao	Technical Support	contract
	Mr. Thongkham Vongphalad	Technical Support	contract
LUANG PRABANG			
	Mr. Sengprasith Thongsavath	Provincial Coordinator	Luang Prabang
	Mr. Soudaphone Rasamee	Technician	Phonexay
	Mr. Khamchar Keudnidkhammany	Technician	Phonexay
	Ms. Somchith Vongpadith	Technician	Phonexay
	Ms. Bouakham Pheangsakta	Technician	Phonexay
XIENG KHOUANG			
	Mr. Khampai Phommavong	Provincial Coordinator	Xieng Khouang
	Mr. Phatphilom Keobouaphanh	Technician	Khoun
	Mr. Chanthaphone Phanthady	Technician	Khoun
	Mr. Souliphon Inthaphone	Technician	Khoun
	Mr. Kingkeo Thammavong	Technician	Khoun
HOUAPHANH			
	Mr. Leejar Xayvinou	Provincial Coordinator	Houaphanh
	Mr. Amphay Phounmanolad	Technician	Viengxay
	Mr. Amphone Thongphouvong	Technician	Viengxay
	Mr. Somvang Xaythor	Technician	Viengxay
	Ms. Chai Phomphet	Technician	Viengxay
	Ms. Anousone Khammouenkhoun	Technician	Viengthong
	Ms. Phaysouk Phoutthapannga	Technician	Viengthong
	Ms. Phouangchanh Phomphet	Technician	Viengthong
	Mr. Soulinxay Phongsavat	Technician	Viengthong
BOKEO			
	Mr. Singthong Soulna	Provincial Coordinator	Bokeo
	Ms. Bouatip Inthapanya	Technician	Pha Oudom
	Mr. Toh Xaygnavong	Technician	Pha Oudom
	Mr. Khammang Manieane	Technician	Pha Oudom
	Mr. Bounkhong Thaveesith	Technician	Pha Oudom
LUANGNAMTHA			
	Ms. Chemnakhone Phaychid	Provincial Coordinator	Luang Namtha
	Ms. Samouan Adphasouk	Technician	Vieng Phoukha
	Mr. Nasavath Sakhoukham	Technician	Vieng Phoukha
	Mr. Vatthana Kongsanah	Technician	Vieng Phoukha
	Mr. Inpanh Vannakham	Technician	Vieng Phoukha

Workshop Program

Time	Session	Facilitator
Oct 18	Review Field Activities	
0800 - 0830	Registration	
0830 - 0845	Introduce objectives of workshop	
0845	Formal Opening of workshop	PAFO
	Reporting on Activities - M. Phonexay - M. Khoun	Souriyasack / John
10.25	Break	
	Reporting on Activities - M. Vlengxai - M. Vingthong	Souriyasack / John
1200 -	LUNCH	
	Reporting on Activities - M. Pha Oudom - M. Veing Phoukha	
	Break	
1515 - 1615	Review overall results	John / Souriyasack
1615 - 1630	Summary of Day 1	
Sept 19	Presentation of CASE Studies of production change and impacts	
0800 - 1000	Review of level of staff capacity	Dr Silinthone, NUOL
1000 - 1015	Break	
1015 - 1200	Review of level of staff capacity (cont.)	
1200 - 1330	LUNCH	
1330 - 1350	Presenting procedures and criteria for review of cases studies	John/ Souriyasack
1350 - 1450	District Groups to select best representative case for their district	staff
1450 - 1515	Presentation of District CASE study	staff
1515 -	Break	
	Presentation of District CASE study (cont.)	staff
1620 - 1650	Summary of day 2	committee

Sept 20 Process for Cross-visits		
0800 - 1000	General review of strengths/ weaknesses of cases studies, and lessons from this	John / Souriyasack
1000 - 1015	Break	
1015- 1200	Introduction to use of cross-visit to expand results	John / Souriyasack
1200 - 1330	LUNCH	
1330 - 1500	Practical advice for managing cross-visits	Mr Ngoungthong and Mr Neuakom (EASLP)
1500 - 1515	Break	
1515 – 1620	Practical advice for managing cross-visits (cont.)	Mr Ngoungthong and Mr Neuakom (EASLP)
1620 - 1630	Summary of Day 3	
Oct 21	Planning for on-going field work	
0800 - 1200	Linkage between CBSLSP and NRSLLDP	Dr Syseng Khounsy
1200 - 1330	LUNCH	
1330 - 1600	Linkage between CBSLSP and NRSLLDP	Dr Syseng Khounsy
1600 - 1620	Summary of Day 4	
1620 - 1630	Close of workshop	Deputy PAFO

Table 4.6 Networking Meetings (Luang Prabang, 2006)

Date	Objectives	Discussions	Progress
9 / 3	1. Planning of previous villages 2006 2. method of village selection	# Previously team do not add more villages and reduces for villages can not follow APs 1. review FLSP villages target for forage cropping more 2. villages can be to continues 3. target village not be continues	# Previously staff can provided theirs ideas as 1. should be active staff to close up farmers 2. to known theirs problem and solve. Questionnaire for solve the problems
23 / 6	1. Annual planning 2. Evaluation of monthly implemented Jun/06 3. Planning of Jul/06	Each district present for success implemented as Pak Ou 6 villages, Xieng Ngeun 11 villages and LPQ 12 villages	# Farmers was best understood for pig raise and find to solve theirs problems. # the staff understand and know step of working and always follow up
2 / 7	1. Review of implemented for PD at Phonexay district 2. Forage cropping at 4 villages, 5 families /village in Phonexay	Preparation for planting - the helping from LPQ and equipment	New work groups have advise from previous team
4 / 7	1. emphatically monthly plan Jul/06 2. Methods of selection for village and family	1. attitude for villages on new technical 2. height beneficiaries for villagers on use forage	
29 / 8	1. Review of implemented on Aug/06 2. Planning Sep/06	1. Explanation-comparison on working method for new district from help by coordinator at Houaphan Province 2. study of farmers ideas with new technical	1. Gives an experiences to new work group advised by previously teams 2. start of minutes meeting records
1 / 12	1. Review of implemented on 11/06 2. Planning Dec/06	1. summarized activities implemented No. of families, what success in activities, next APs, previously events 2. meeting method should be split of groups and share the ideas 3. selection of village for vaccines (poultry) 4. it's important for monthly meeting ,so every body should be attend	1. it is good one for activities summarized it's convenient and easy to understand
22 / 12	1. Review of implemented on 12/06 2. Planning Jan/06	1. for pig raising and poultry: improve feeding systems, improve house system for pig and poultry 2. to kept some of pig or poultry to laboratory room 3. real practice from LAB officer is important	1. previous and new staff was interesting this technique 2. LAB officer have base knowledge for the training

Table 4.7 Mentor Workshop M1# (Feb. 21-24, 2006)

List of Participants

No	Name	Position	Organization
1	Gnungthong Sihanath	Director	National Livestock Extension Center
2	Chansouk Chanthanon	Technician	Pak Ou DAFEO
3	Vongdeuan Kirasatith	Technician	Luang Prabang DAFEO
4	Bounthanom Angkhalay	Technician	Xieng Nguen DAFEO
5	Kenechan Bounpanngavong	Technician	Luang Prabang DAFEO
6	Vayee Yang	Technician	Xieng Nguen DAFEO
7	Viengsouk	DAFEO Head	Peak DAFEO
8	Khamphay Phommavong	Technician	Livestock Section, PAFO
9	Chonephet	Technician	Nong Het DAFEO
10	Ms. Sin	Head of Livestock Unit	Peak DAFEO
11	Ms. Davanh Douangthanousone	Technician	Peak DAFEO
12	Kao Yang	Technician	Nong Het DAFEO
13	Vong Philavong	Technician	Nong Het DAFEO
14	Keosakhone	Technician	Xieng Nguen DAFEO
15	Ms. Chansamone	Technician	Luang Prabang DAFEO
16	Soulideth Phaphonsay	Livestock Section	PAFO
17	Sengpasith Thongsavath	Head, Livestock Section	PAFO
18	Thongkham Vongphalath	Technician	Pak Ou DAFEO
19	Soudaphone Latsamy	Technician	Phonexay DAFEO
20	Phaysith Malee	Technician	Xieng Nguen DAFEO
21	Sengphet Sysouk	Technician	Xieng Nguen DAFEO
22	Thavone Manee	Technician	Luang Prabang DAFEO
23	Xayvanesa Soukkee	Technician	Phonexay DAFEO
24	Bouakham Pheangsakta	Technician	Phonexay DAFEO
25	Somchith Vongpadith	Technician	Phonexay DAFEO
26	Keonong	Technician	Peak DAFEO
27	Nurakhom Thepnimith	Technician	Nong Het DAFEO
28	Ms. Thongbay Sisomephone	Head, Livestock Unit	Luang Prabang DAFEO
29	Somsak	Technician	Luang Prabang DAFEO
30	Somvanh Phommalee	Technician	Xiengneun DAFEO
31	Somphong Pradichith	Director General	PAFO
32	Khamphay Thammavong	Acting Director General	DLF
33	Phachone Bounma	Deputy Head, Techn. Division	DLF
34	Souriyasack Chayavong	Deputy head, Plan. Div/ NPD	DLF
35	Nilan Somvichith	Planning Division	DLF
36	Bounthavong Kounnavongsa	Researcher / PC	Livestock Research Center
37	Phonepaseuth Phengsavanh	Researcher	Livestock Research Center
42	John Connell	Project Adviser	CIAT
43	Werner Stur	Project Adviser	CIAT
44	Gavin Varney	Project Adviser	CIAT

Workshop Program

TIME	SESSION	FACILITATORS
Tuesday, 21 February 2006		
08:00 – 08:30	Registration	Secretariats
08:30 – 09:00	Opening Session: <ul style="list-style-type: none"> • Introduce to the meeting program by meeting facilitator • Opening speech of Director General of LPB PAFO • Group photo 	Secretariat LPB PAFO All participants Souriyasack
09:00 – 09:30	Introduction: Capacity Building for smallholder Livestock System	John Connell
09:30 – 10:00	Brief of Capacity Building for smallholder Livestock System project	
10:00 – 10:15	Coffee / Tea break	
10:15 – 11:15	The needed and necessary from former FLSP staff as the mentor	Phonepaseuth
11:15 – 12:00	Brief of the process that two project teams introduced to setting up the CBSLSP in 6 new districts.	Souriyasack
12:00 – 13:30	Lunch	
13:30 – 15:00	Action plan and Activities in 6 new districts	John Connell, Phonepaseuth
15:00 – 15:15	Coffee / Tea break	
15:30 – 16:30	Group discussion: Action plan and Activities in 6 new districts	All participants
Wednesday 22 February 2006		
08:30 – 09:00	Presentation about: Group discussion: Action plan and Activities in 6 new districts	Group represent. All participants
09:00 – 10:00	Discussion on the presentation / group discussion / plan-activities	
10:30 – 10:45	Coffee / Tea break	
10:45 – 12:00	Mentoring	John Connell, Phonepaseuth
12:00 – 13:30	Lunch	
13:30 – 15:00	Village and group selection (group discussion and presentation)	All participants
15:00 – 15:15	Coffee / Tea break	
15:15 – 16:30	Farmer calendar (group discussion and presentation)	All participants

Thursday 23 February 2006		
08:30 – 10:00	Classification of present livestock system in FLSP villages after the team of PMU and project advisors had the sample surveyed and the suggestive ways to improve the livestock system in those villages.	All participants
10:00 – 10:15	Coffee and Tea break	Gavin Varney, Werner Stur
10:45 – 12:00	District / Team discussion on present livestock system classification of their target villages	
12:00 – 13:30	Lunch	
13:30 – 15:00	Presentation on the result of District / Team discussion on present livestock system classification of their target villages	All mentor staff
15:00 – 15:15	Coffee and Tea break	
15:15 – 16:30	Discussion on the Presentation of the present livestock system classification of their target villages	Represent. of district / group
Friday 24 February 2006		
08:30 – 09:00	Annual plan, action plan and activity plan of CBSLSP for 2006	Souriyasack, Phonepaseuth
09:00 – 10:30	Annual plan, action plan and activity plan of CBSLSP for 2006 (group discussion and presentation)	All mentor staff
10:30 – 10:45	Coffee and Tea break	
10:45 – 12:00	Continue working on Annual plan, action plan and activity plan of CBSLSP for 2006 (group discussion and presentation)	All mentor staff
12:00 – 13:30	Lunch	
13:30 – 15:30	Presentation of the result of the group discussion on Annual plan, action plan and activity plan of CBSLSP for 2006	Represent. of each group
15:30 – 15:45	Coffee and Tea break	
15:15 – 16:30	The way to operate the activities of CBSLSP	Phonepaseuth

Table 4.8 Mentor Workshop M2 (Sept. 27-30, 2006)

List of Participants

No	Name	Position	Organization
1	Ms. Dongdavanh Sibounthong	Planning section	DLF
	Mr. Souriyasack Chayavong	Project Coordinator (DLF)	DLF
	Mr. Bounthavong	Technical Support (NAFRI)	NAFRI
	Mr. Viengxay Phtakhoun	Technical Support (contract)	Contract
	Mr. Phonepaseuth	Senior Trainer (contract)	contract
LUANG PRABANG			
	Mr. Saengprasith	Provincial Coordinator	Luang Prabang
	Mr. Thavone Mani	Technician	Luang Prabang
	Ms. Chanh Samone Bialao	Technician	Luang Prabang
	Mr. Somsak Inthasone	Technician	Luang Prabang
	Ms. Thongbay Siesomphone	Technician	Luang Prabang
	Mr. Kenchanh Bounpanyavong	Technician	Luang Prabang
	Mr. Vongdeuane Kilasakid	Technician	Luang Prabang
	Mr. Vayie Yangcheakoa	Technician	Xieng Ngeun
	Mr. Somvanh Phommali	Technician	Xieng Ngeun
	Mr. Paysith Maly	Technician	Xieng Ngeun
	Ms. Keosakon Khunsamathong	Technician	Xieng Ngeun
	Mr. Sengpeth Sisouk	Technician	Xieng Ngeun
	Mr. Bounthanome Angkhalai	Technician	Xieng Ngeun
	Ms. Chamsouk Chanhthanoun	Technician	Pak Ou
	Mr. Thongkham Vongphalad	Technician	Pak Ou
XIENG KHOUANG			
	Mr. Khampai Phommavong	Provincial Coordinator	Xieng Khouang
	Mr. Viengsuk Lorbrayao	Technician	Paek
	Ms. Sin Phuttapanya	Technician	Paek
	Mr. Keoanong Sipaseuth	Technician	Paek
	Mr. Davanh Doungtanuson	Technician	Paek
	Mr. Kuthao PiaLuang	Technician	Nong Het
	Mr. Neuakoum Theppanith	Technician	Nong Het
	Mr. Kaoyang Yongma	Technician	Nong Het
	Mr. Vong Philavong	Technician	Nong Het
	Ms. Chongpeth Phomvisay	Technician	Nong Het

Workshop Program

Time	Session	Facilitator
Sept 28 Pig Production systems		
0830 to 1030	District review - Current system development / village - Interventions needed / village	Seuth / Viengxay
1030 to 1045	break	
1045 - 1200	Nutrition requirement and local sources Birth – weaning, / Growth / Piglet production, Wet / dry seasons.	W. Stür / Seuth
1200 - 1330	Lunch	
1330 - 1400	Management - Housing / Weaning / nesting - Breeding	Gavin / Viengxay
1400 - 1500	Health - Nutrition / health relationships - Common disease identification /treatment	Werner / Seuth
1500 – 1515	Break	
1515 - 1630	Breeding - Characteristics of good mates	Gavin / Viengxay
Sept 29 Cattle / Buffalo production systems		
0830 to 1030	District review - Current system development / village - Interventions needed / village	Seuth / Viengxay
1030 to 1045	break	
1045 - 1200	Nutrition requirement and local sources - Birth – weaning / Growth / calving / Wet / dry seasons	W. Stür / Seuth
1200 - 1330	Lunch	
1330 - 1400	Management - Housing / Weaning / nesting / Breeding	Gavin / Viengxay
1400 - 1500	Health - Nutrition / health relationships - Common disease identification /treatment	Werner / Seuth
1500 – 1515	Break	
1515 - 1630	Breeding - Characteristics of good mates	Gavin / Viengxay
Sept 30 Extension and poultry		
0830 - 1030	Mentoring - Results of mentoring - Mentoring guidelines and procedures - Management of mentoring	John / Seuth
1030 - 1035	Break	
1035 - 1200	Improved rural poultry systems - Housing - Nurseries - Feed - Vaccination	Gavin / Viengxay
1200- 1300	lunch	
1300 - 1630	Field visit – poultry production @Khoun district	Khoun DAFEO

Table 4.9 Mentor Workshop M3 (Mar. 26 - 30, 2007)

List of Participants

#	Name	Position	Organisation
1	Dr. Bounlkhouiang	DG	DLF
2	Dr Chantouboun	Head	DLF
3	Mr. Sonesavad Vanthala	Head	Livestock Section/XKH
4	Mr. Souriyasack Chayavong	NPD	DLF/PMU
5	Mr Bounthavong Khounnavongsa	Training Coordinator	NAFRI/PMU
6	Miss Viengkong Sivaneckham	Administrator	CBSLSP
7	Mr. Phonepaseuth Phengsavanh	Scientist/trainer	NAFRI
8	Mr. Phout Inthavong	Veterinarian/trainer	DLF
9	Ms Sriphun	Staff	DAFRO Khoun dist./SADU
		LUANG PRABANG	
10	Mr. Saengprasith Thongsavath	Prov. Coordinator	PAFO, Luang Prabang
11	Mr. Thavone Mani	Extension staff	LPB, DAFEO
12	Ms. Chanhsamone Bialao	Extension staff	LPB, DAFEO
13	Mr. Somsak Inthasone	Extension staff	LPB, DAFEO
14	Ms. Thongbay Siesomphone	Extension staff	LPB, DAFEO
15	Mr. Kenchanh Bounpanyavong	Extension staff	LPB, DAFEO
16	Mr. Vongdeuane Kilasakid	Extension staff	LPB, DAFEO
17	Mr. Somvanh Phommali	Extension staff	Xieng Ngeun DAFEO
18	Mr. VayieYangcheakoa	Extension staff	Xieng Ngeun DAFEO
19	Mr. Paysith Maly	Extension staff	Xieng Ngeun DAFEO
20	Ms. Keosakon Khunsamathong	Extension staff	Xieng Ngeun DAFEO
21	Mr. Sengpeth Sisouk	Extension staff	Xieng Ngeun DAFEO
22	Mr. Bounthanome Angkhalai	Extension staff	Xieng Ngeun DAFEO
23	Ms. Chamsouk Chanhthanoun	Extension staff	Pak Ou DAFEO
24	Mr. Thongkham Vongphalad	Extension staff	PaK Ou DAFEO
		XIENG KHOUANG	
25	Mr. Khampai Phommavong	Prov. Coordinator	Livestock Sect. , PAFO, XKH
26	Mr. Viengsuk Lorbrayao	Extension staff	Paek DAFEO
27	Ms. Sin Phuttapanya	Extension staff	Paek DAFEO
28	Mr. Keoanong Sipaseuth	Extension staff	Paek DAFEO
29	Mr. Davanh Doungtanuson	Extension staff	Paek DAFEO
30	Mr. Kuthao Pialouang	Extension staff	Nong Het DAFEO
31	Mr. Neuakoum Theppanith	Extension staff	Nong Het DAFEO
32	Mr. Kaoyang Yongma	Extension staff	Nong Het DAFEO
33	Mr. Vong Philavong	Extension staff	Nong Het DAFEO
34	Ms. Chongpeth Phomvisay	Extension staff	Nong Het DAFEO
35	DG / DDG / Planning officer	PAFO of XKH	PAFO XKH
36	Mr. John G Connell	Project Advisor	CIAT

Workshop Program

Time	Session	facilitators
Day 1 – March 26		
08:00 – 08:30	Registration	
08:30 – 08:45	Introduction of objectives of meeting	Bounthavong
08:45 – 09:15	Opening	Director PAFO
09:15 – 09:30	Progress of CBSLSP to date	Souriyasack
09:30 – 09:45	Progress and links to NRS LDP	DLF
09:45 – 10:00	coffee	
10:00 – 12:00	Introduction to Market Chains - 'market chains' and how they can stimulate production and farmers interest in improved technologies - role of 'service provider' to enable intensive production systems, and how they can expand impact	Connell/resource staff
12:00 – 13:30	coffee	
13:30 – 14:45	Tools for assessment of market chains - Mapping the market chain and its actors - Seasonality - Trends - Purchase conditions	Connell/resource staff
14:45 – 15:00	Coffee	
15:00 – 16:20	Tools (continue)	Connell/resource staff
16:20 – 16:30	Planning field exercise	Connell
16:30 – 16:45	Outline for Progress Reports	Bounthavong
Day 2 – March 27		
08:00 – 12:00	Market Chain surveys (Paek / Khoun) - Pigs - Cattle - Poultry - Goats/ fish	Connell/resource staff
12:00 – 13:30	Lunch	
13:30 – 15:00	Preparation of Reports	Connell/resource staff
15:00 – 15:15	Coffee	
15:15 – 16:20	Presentation of market surveys	Connell
16:20 – 16:30	Summary	Connell
Day 3 – March 28		
0830-1000	Presentations of surveys (cont.)	Connell
1000 - 1015		
1015 - 1100	Discussion	

1100 - 1200	Application for 2007	
1200-1300	Lunch	
1300 - 1430	Progress Reports Xieng Khouang: Paek and Nong Het	Ponepraseuth/ Phouth
1430- 1500	Coffee	
1500- 1630	Continue	Ponepraseuth/ Phouth
Day 4 – March 29		
08:30 – 12:00	Progress Reports Luang Prabang (LPB, Xieng Nguen, PakOu)	Ponepraseuth/ Phouth
12:00 – 13:30		
1300 – 14:00	Brian storming ➤ Opportuntite for intensification ➤ Challenges ➤ Interventions	Ponepraseuth/ Phouth
16:20 – 16:30	Summary	
Day 5 – March 30		
08:00 – 12:00	Development of action plans for 2007 by each district	Ponepraseuth/ Phouth
12:00 –13:30	Lunch	
13:30 – 16:30	Presentaiton of action plans for each district	Souriyasack

Table 4.10 Mentor Workshop M4 (Nov. 5- 8, 2007)

List of Participants

#	Name	Position	Organisation
1	Mr. Souriyasack Chayavong	NPD	DLF/PMU
2	Mr Bounthavong Khounnavongsa	Training Coordinator	NAFRI/PMU
3	Miss Viengkhang Sivaneckham	Administrator	CBSLSP
4	Mr Phonepaseuth		NAFRI
	LUANG PRABANG		
5	Mr. Sengprasith Thongsavath	Prov. Coordinator	PAFO, Luang Prabang
6	Mr. Thavone Mani	Extension staff	LPB, DAFEO
7	Ms. Chanhsamone Bialao	Extension staff	LPB, DAFEO
8	Mr. Somsak Inthasone	Extension staff	LPB, DAFEO
9	Ms. Thongbay Siesomphone	Extension staff	LPB, DAFEO
10	Mr. Kenchanh Bounpanyavong	Extension staff	LPB, DAFEO
11	Mr. Vongdeuane Kilasakid	Extension staff	LPB, DAFEO
12	Mr. Somvanh Phommali	Extension staff	Xieng Ngeun DAFEO
13	Mr. VayieYangcheakoa	Extension staff	Xieng Ngeun DAFEO
14	Mr. Paysith Maly	Extension staff	Xieng Ngeun DAFEO
15	Ms. Keosakon Khunsamathong	Extension staff	Xieng Ngeun DAFEO
16	Mr. Sengpeth Sisouk	Extension staff	Xieng Ngeun DAFEO
17	Mr. Bounthanome Angkhalai	Extension staff	Xieng Ngeun DAFEO
18	Ms. Chamsouk Chanhthanoun	Extension staff	Pak Ou DAFEO
19	Mr. Thongkham Vongphalad	Extension staff	PaK Ou DAFEO
20			
	XIENG KHOUANG		
21	Mr. Khampai Phommavong	Prov. Coordinator	Livestock Sect. , PAFO, XKH
22	Mr. Viengsuk Lorbiayao	Extension staff	Paek DAFEO
23	Ms. Sin Phuttapanya	Extension staff	Paek DAFEO
24	Mr. Keoanong Sipaseuth	Extension staff	Paek DAFEO
25	Mr. Davanh Doungtanuson	Extension staff	Paek DAFEO
26	Mr. Kuthao Pialouang	Extension staff	Nong Het DAFEO
27	Mr. Neuakoum Theppanith	Extension staff	Nong Het DAFEO
28	Mr. Kaoyang Yongma	Extension staff	Nong Het DAFEO
29	Mr. Vong Philavong	Extension staff	Nong Het DAFEO
30	Ms. Chongpeth Phomvisay	Extension staff	Nong Het DAFEO
31	Mr. John G Connell	Project Advisor	CIAT

Workshop Program

Time	Session	facilitators
Day 1 – Nov. 5		
08:00 – 08:30	Registration	
08:30 – 08:45	Introduction of objectives of meeting	Bounthavong
08:45 – 09:15	Opening	Director PAFO
09:15 – 09:30	Progress of CBSLSP to date	Souriyasack
09:30 – 09:45	Progress and links to NRSLDP	DLF
09:45 – 10:00	coffee	
10:00 – 12:00	Report on intensification of production systems - Nong Het - Paek	Phonpraseuth
12:00 – 13:30	LUNCH	
13:30 – 14:45	Report on intensification of production systems - Pak Ou - Luang Prabang	Phonpraseuth
14:45 – 15:00	Coffee	
15:00 – 16:20	Report on intensification of production systems - Xieg Ngeun	Phonpraseuth
16:20 – 16:30	Summary of day 1#	Souriyasack
Day 2 – Nov 6		
08:00 – 12:00	Market Chain surveys reports - Pak Ou - Luang Prabang - Xieg Ngeun	Staff
1000 -1020	Break	
1020 – 1130	Market Chain surveys reports - Pak Ou - Luang Prabang - Xieg Ngeun	Staff
1130 - 1200	Discussion of effect and role of PMCS	Connell
12:00 – 13:30	Lunch	
13:30 – 15:00	Procedures for data collection for end of project	Souriyasack
1500-1515	Break	
1515 - 1600	Planning for study trip	
Days 3,4 - Nov 7,8		
	Travel to Sayboui Inspect SCV system established Return to LPB	

Table 4.11 Supplementary Training inputs for 'enhanced' production

Date	Input	Location	No. trainees	Topic	Technical areas covered
22/08/06	Specific	Xiang Khouang	2 (N), 2 (P) 1 (Khouang)	Parasite control (theory)	<ul style="list-style-type: none"> Internal parasites Choice of anthelmintic When/what animals to treat How much to administer/calculating liveweight How to administer in a stress free manner Weighing animals
29/08/06	Monthly meeting	Luang Prabang	6 (LP), 6 (XN), 2 (PO), 4 (Phonexay)	Parasite control (theory)	<ul style="list-style-type: none"> Internal parasites Choice of anthelmintic When/what animals to treat How much to administer/calculating liveweight How to administer in a stress free manner Weighing animals
22/09/06	Specific	Luang Prabang Agriculture & Forestry College	6 (LP), 6 (XN), 2 (PO), 4 (Phonexay) Others	Body Condition Scoring (BCS) (theory & practical)	<ul style="list-style-type: none"> Cattle, pigs and goats BCS What is BCS? Why should I BCS? When do I BCS? How do I BCS? BCS targets for optimum livestock performance
23-24/11/06	Specific ACIAR pig training & workshop	Vientiane	2 (NH), 2 (P), 2 (PO), 2 XN Others	Pig Production (theory)	<ul style="list-style-type: none"> Disease identification & treatment Quarantine & animal movement control The pig cycle – farrowing/post birth/weaning/finishing/mating/gestation

22/12/06	Monthly meeting	Luang Prabang - Animal health Laboratory	6 (LP), 6 (XN), 2 (PO), 4 (Phonexay)	Pig disease (theory & practical)	<ul style="list-style-type: none"> • Disease identification & treatment • Quarantine & animal movement control • Sample collection • Autopsy procedures
05- 06/01/07	Specific	Kok Wan Luang Prabang	6 (LP)	Pig pen construction (theory & practical)	<ul style="list-style-type: none"> • Planning a pig house • Site the pig house • Building the pig house • Pen layout • Flooring/walls/roofing • Feed trough • Water supply • Effluent collection • Hygiene • Maintenance
28/03/07	CBSLSP Quarterly meeting	Xiang Khouang	6 (LP), 6 (XN), 5 (P), 5 (NH), 2 (PO)	Cattle Management (theory)	<ul style="list-style-type: none"> • stockmanship • housing and penning • nutrition and water • health • observation
22/05/07	Monthly meeting	Luang Prabang	6 (LP), 6 (XN), 2 (PO), 4 (Phonexay)	Cattle & pig feed troughs & water supply (theory & practical)	<ul style="list-style-type: none"> • trough design • trough dimensions • trough placement • maintenance • water supply systems
31/05/07	Monthly meeting	Xiang Khouang	5 (P), 5 (NH)	Cattle & pig feed troughs & water supply (theory)	<ul style="list-style-type: none"> • trough design • trough dimensions • trough placement • maintenance • water supply systems
13/06/07	Specific	Luang Prabang Kok Wan	6 (LP), 6 (XN), 2 (PO), 4 (Phonexay)	Effluent management (theory & practical)	<ul style="list-style-type: none"> • Manure collection • Stockpiling and management • Collection trenches/pits • Pen hygiene

20/06/07	Monthly meeting	Luang Prabang	6 (LP), 6 (XN), 2 (PO), 4 (Phonexay)	Sow/piglet management (theory)	<ul style="list-style-type: none"> • Selecting gilts for breeding • Mating gilts • Keeping records • Estrous (heat) signs • Timing & number of services • Best time for mating • Mating practices • Gestation • Farrowing • Post parturition management • Piglet comfort area • Lactating sow/piglet nutrition • Weaning • Boar selection and management
30/06/07	Monthly meeting	Xiang Khouang	5 (P), 5 (NH)	Sow/piglet management (theory)	<ul style="list-style-type: none"> • Selecting gilts for breeding • Mating gilts • Keeping records • Estrous (heat) signs • Timing & number of services • Best time for mating • Mating practices • Gestation • Farrowing • Post parturition management • Piglet comfort area • Lactating sow/piglet nutrition • Weaning • Boar selection and management
14/08/07	Specific	Luang Prabang Kok Wan	6 (LP), 6 (XN), 2 (PO), 4 (Phonexay)	Compost making (theory & practical)	<ul style="list-style-type: none"> • What is compost? • Why make compost? • Materials needed to make compost • How to make compost • Compost problem solver

03/09/07	Specific L4pp training/workshop	Xiang Khouang	5 (NH), 5 (P), 6 (XN), 2 (PO) Others	Pig management (theory)	<ul style="list-style-type: none"> • Behaviour of pigs • What pigs need • Planning & building a pig pen • Feed trough & water supply • Pig nutrition • The importance of water • Pig pen care and maintenance • Managing pigs in a stress free manner
28- 29/10/07	Specific (video)	Luang Prabang Pik Noi	6 (LP), 6 (XN), 2 (PO), 4 (Phonexay)	Pig pen construction (theory & practical)	<ul style="list-style-type: none"> • Planning a pig house • Site the pig house • Building the pig house • Pen layout/Flooring/walls/roofing • Feed trough/Water supply • Effluent collection • Hygiene & maintenance
02/11/07	Specific	Luang Prabang Kok Wan	6 (LP), 6 (XN), 2 (PO), 4 (Phonexay) 1 (NH)	Compost utilisation (theory & practical)	<ul style="list-style-type: none"> • Crop management • When is compost ready to use? • How much compost do I need to maintain crop vigour? • How do I apply compost to my crops/vegetables? • How often do I need to fertilize my crops/vegetables?

Table 4.12 Provincial Coordinators Workshop

18 -19 June, 2006, Luang Prabang

List of Participants

	Name	Position	Organization
1	Souriyasack	NPD	CBSLSP / DLF
2	John Connell	TA	CBSLSP / CIAT
3	Mr. Bounthavong	Training	CBSLSP / NAFRI
4	Mr. Chantaboune Siimantoun	Act. Head Planning Division	DLF
5	Mr. Pantavone Vongusmphan	Technician	DLF
6	Mr. Saengprasith Thongsavith	Head Livestock Section	PAFO, Lung Prabang
7	Mr. Khampai Phommavong	Technician	PAFO, Xieng Khouang
8	Mr. Singthong Souiya	Planning	PAFO, Bokeo
9	Ms. Chemakhong Phaychith	Dp. Head Livestock	PAFO, Luang Namtha
10	Mr. Leejar Xayveenou	Dp. Head Livestock	PAFO, Houaphan

Workshop Program

Time	Session	Facilitator
DAY 1		
AM	Introduction	John Connell
	Comments DLF	Mr Chantaboune
	Review of Activities to date	Souriyasack
	Reports – field activities	Provinces
PM	Reports - Mentoring process/management	Provinces
	Discussion	
DAY 2		
AM	Management duties PC	John Connell / Souriyasack
	Discussion	
	Resources (allowances, equipment etc)	
PM	Seed distribution	
	Closing remarks	Mr Chantaboune

6 July , 2007, Vientiane

No.	Name	Position	Organization
1	Mr. Souriyasack Chayavong	NPD	DLF / CBSLSP
2	Dr Syseng	Designated NPD	DLF / NRSLLDP
3	Mr Bounthavong	Training	CBSLSP / NAFRI
4	Mr. Saengprasith Thongsavith	Head Livestock Section	PAFO, Luang Prabang
5	Mr. Khampai Phommavong	Technician	PAFO, Xieng Khouang
6	Mr Singthong Souiya	Planning	PAFO, Bokeo
7	Ms. Chemakhong Phaychith	Dp. Head Livestock	PAFO, Luang Namtha
8	Mr. Leejar Xayveenou	Dp. Head Livestock	PAFO, Houaphanh
9	Mr John Connell	TA	CBSLSP / CIAT
10	Mr Ngounthong	Coordinator	EASLP

Meeting Program

Time	Session	Facilitator
0800 - 0803	Registration	Secretariat
0830 - 0940	Brief reports from each Province - status of market awareness activity	PCs
0940 - 1000	Key Activities to end of project - Exposure trip for local authorities - Daklak study trip - Assessments - Training workshops - Lessons Learnt workshop	Souriyasack
1000 - 1015	Break	
1015 - 1100	Monitoring requirements for end of project - district level collection - case studies - process of case study development	John
1100 - 1200	Administration	Souriyasack
1200 -1330	LUNCH	
1330 - 1500	Linkage with NRSLLDP	Dr Syseng
1500- 1515	Break	
1515 - 1600	Planning for Exposure Trip	Souriyasack
1600	Close	

Table 4.13 Monitoring Trips

Date	Staff	Sites Visited	Key Issues
2006			
April 21-24	Souriyasack Bounthavong	Viengthong, Viengxai, Khoun	Reviewed establishment of District Forage Nurseries
May 21 -26	Souriyasack, John Connell	Pha Odom, Vieng Phoukha, Honea	Review: Village prep; District Forage Nurseries, Finance
June 12 - 14	Souriyasack	Khoun	Follow-up trainee staff visit to mentor district
June 21-22	Souriyasack, Bounthavong	Luang Prabang	Review administration
July 3-4	Souriyasack	Luang Prabang	Monitor monthly meeting
Jul 20 – Aug 4	Souriyasack Bounthavong	Viengthong, Viengxai, Nong Het, Paek	Review farmers' plots Assist Prov. in financial management
August 25 -29	Souriyasack	Xieng Khouang, Luang Prabang	Monitor monthly meeting, Review progress Khoun,
Sept. 10-20	Bounthavong, Thongkham, Gavin	Pha Oudom, Vieng Phoukha	Review farmers' plots Assist Prov. in financial management
Oct 1 - 6	Souriyasack	Houaphanh	Review progress > workshop
Nov 14 – 18	Bounthavong, Gavin	Pak Our, Luang Prabang	Review models for village poultry
Dec 6 - 10	Souriyasack,	Xieng Khouang	Monitor village exchange mtg
Dec 14 - 17	Bounthavong	Phonxay	Monitor 'village exchange mtg
	Souriyasack	Bokeo, Luang Namtha	Monitor 'village exchange mtg
2007			
Jan. 8-10	Souriyasack Viengkhang	Xieng Khouang (Khoun)	Review accounting issues Review field activities
Jan 23-31	Souriyasack	Xieng Khouang (Paek) Houaphanh	Show CBSLSP to EASLP Review field activities
Mar. 7-10	Souriyasack	Xieng Khouang	Join SADU mtg for CAHSP
Mar.30 –Ap 2	Souriyasack	Xieng Khouang (Say Yom village), LPB	Review work for 2007 (LPB) Model farmer Sayyom village
Ap 20-28	Souriyasack	Bokeo, Luang Namtha, Houaphanh	Joint monthly meeting for Pha Oudom, VPH, Review field
May 8-10	Souriyasack	Houaphanh, Luang Namtha, Luang Prabang	Provide seed. Prepare Joint Monitoring Trip
Jun 23-28	Souriyasack	Bokeo, Luang Namtha	Joint Monthly Meeting for P Oudom and VPK
Jun 25-29	Bountavong	Luang Prabang	Review field activities
Jul 12-14	Bountavong	Xieng Khouang, Hashanah	Prepare VDO Review Field
Jul 15-19	Souriyasack	Luang Prabang	Review poultry production with IFAD (Antonio Rota)
Sept 1-6	Bountavong	Xieng Khouang	Attend L4PP Review field activity
Sept 5-13	Souriyasack	Luang Prabang, Luang Namtha,	Joint Monthly Mtg for Pha Oudom and VPK Review activities in field
Sept 27-30	Souriyasack	Luang Prabang	Review enhanced production (GV). Attend DLF national mtg
Sept 23-27	Bounthavong	Xieng Khouang	Review market activities (PMCS)
Oct 14-26	Souriyasack	Luang Prabang, Luang Namtha, Houaphanh, Bokeo	Review activities for last 2 mth
Nov 9-11	Souriyasack	Luang Prabang	Review data collection for Final Rpt.

Table 4.14 Joint Monitoring Trip (June 8-12, 2007)

List of Participants

	Name	Position	Organisation
1	Dr Somphanh	Deputy Director general	DLF
2	Dr Chantaboune	Head of Planning	DLF
3	Dr Syseng	Designated NPD for NRSLLDP	DLF
4	Mr Souriyasack	NPD for CBSLSP	CBSLSP
5	Mr Leeja	Provincial Coordinator	PAFO Houaphanh
6	Mr Saengprasith	Provincial Coordinator	PAFO Luang Prabang
	Mr Khampai	Provincial Coordinator	PAFO Xieng Khouang
7	Mr Gavin Varney	Technical Advisor	CIAT
8	Mr John Connell	Technical Advisor	CIAT

Trip Program

Date	Site	Key Point
June 8	Travel to XKH by air Nalam village	Extensive area of forages for cattle fattening (Lao Loum)
June 9	Travel to Nong Het Village Travel to Houaphanh	Fattening multiple animals/reduction of shifting cultivation (Lao Soung)
June 10	Travel to Viengxay Villages x 4 Travel to Viengthong	Forage establishment in trainee area Significant sue developing with pigs Use of stylo leaf meal Trainee staff capacity
June 11	Village x 2 Travel to LPB	Forage Est. Use for cattle fattening
June 12	Review Meeting Return to Vientiane	Assessment of approach Decide on hand-over strategy CBSLSP/NRSLLDP

Table 4.15 Exposure Trip: Local Authorities – (July 9 -10, 2007)

List of Participants

	Name	Position	Organisation
1	Mr Boukhouang Khamvouhean	DG	DLF
2	Mr Souriyasack Chayavong	NPD	CBSLSP, PMU
3	Mr Bounthavong	Train coordinator	CBSLSP
	LUANG NAMTHA		
4	Ms. Chaemnakorn	Prov. Coordinator.	PAFO, Luang Namtha
5	Ms Nangbauthong Inthongxai	Head Section	PAFO, Luang Namtha
6	Mr Teovongpheth Setkiamsaeng	Deputy Gov	Vieng Phoukha
7	Mr. Sriphun	Deputy Head	Vieng Phoukha, DAFEO
8			
	XIENG KHOUANG		
9	Mr Phommah Lattana	Deputy Head	Khoun, DAFEO
10	Mr Srivonh	Deputy Govenor	Khoun
11	Mr Khamphai Phommavong	Prov. Coordinator.	PAFO
12	Mr Keonong Sripraseuth	Staff	Paek, DAFEO
13	Mr Sonsavath	Head	Livestock, PAFO
	LUANG PRABANG		
14	Mr. Sengprasith Tongsavath	Prov. Coordinator.	PAFO, LPB
15	Mr Khamla Soudaphon	Deputy Govenor	Phonexay
16	Mr Khamphout	Head	Phonexay, DAFEO
	BOKEO		
17	Mr Singthong Souliyah	Prov. Coordinator.	PAFO, Bokeo
18	Mr Khamlee Philakonh	Livestock section	Bokeo
19	Mr Chanting	Deputy Govenor	Pha Oudom
20	Mr Permphouang Tdannasack	Head	Pha Oudom, DAFEO
	HOUAPHANH		
21	Mr Leeja Xaibello	Prov. Coordinator.	PAFO, Luang Namtha
22	Mr Teokhamnoi Phomsombath	Head	Livestock Sect, PAFO
23	Ms Bualiang Khamerkhoun	Deputy Govenor	Viengthong
24	Mr khampanh Souwanphon	Deputy Head	Vienthong DAFEO,
25	Mr Somphang Leetongpong	Deputy Govenor	Viengxay
26	Mr. Khamstone	Deputy Head	Viengxay, DAFE

Trip Program

Time	Session	facilitators
July 10		
0700 - 1730	Group 1: Nong Het - visit Sandon and Keoprato villages - review on key points to present next day	Viengthong Viengxay Khoun
	Group 2: Paek - Phonthong and Nalam vilalges - review key points for presentation next day	Pha Oudom Vieng Phoukah Phonexay
July 11		
0800 – 0815	Registrastion	
0815 - 0825	Intorduce objectives of meeting	
0825- 0855	Formal opening of meeting	Head of PAFO
0855 - 0935	Present - mian objetkves for lviestock delvoepment of DLF - role of CBSLSP - conditons needed for NRSLLDP	DG of DLF
0935 - 1015	Presnet strategies and activites of CBSLSP	Suriyasack
1015 -1030	Break	
1030 - 1100	Role of srvide providers and trade procedures	Mr Sompheng
1100 - 1130	Report on field trips	participants
1130 - 1200	Discssion of observations	
1200-1330	LUNCH	
1330 - 1430	Results fromr SCV	PRONAE
1430 - 1630	Field Trip to SCV	

Table 4.16 Study Trip – Daklak, Vietnam (Aug. 26 – 29, 2007)

List of Participants

No	Name and Family	Position	Origination
1	Dr. Somphanh Chanphengxay	DDG of DLF	DLF
2	Mr. Chanthaboun Sirimanotham	Head of Planning Division	DLF
3	Dr. Syseng Khounsy	NRSLLDP Head	DLF / NRSLLDP
4	Mr. Souriyasack Chayavong	National Project Director	DLF / CBSLSP
5	Mr Phonpaseuth Phengsavanh	Project Facilitator	NAFRI / CIAT
6	Dr. Werner Stur	Project Advisor	CIAT
7	Mr. Khamy Chanthavongsy	PAFO DDG	PAFO, Xieng Khouang
8	Mr Khamphai Phommavong	Provincial Coordinator	PAFO, Xieng Khouang
9	Mr. Satiene Vannasouk	PAFO DDG	PAFO, Houaphanh
10	Mr. Leechar Xaybeenou	Provincial Coordinator	PAFO, Houaphanh
11	Mr. Somchane Miduoangchan	PAFO DDG	PAFO, Luang Namtha
12	Mrs. Chemnakhone Phaychith	Provincial Coordinator	PAFO, Luang Namtha
13	Mr. Xaiyaphane Lasy	PAFO DDG	PAFO, Luang Prabang
14	Mr. Sengpasith Thongsavath	Provincial Coordinator	PAFO, Luang Prabang
15	Mr. Khammanh Chanthakeo	PAFO DDG	PAFO, Bokeo
16	Mr. Singthong Souliya	Provincial Coordinator	PAGO, Bokeo

Program for Trip

Day (August)	Activity	Key Point
Sun. 26	Travel VTE – HMC – BMV	-
Mon 27	Meet officials, traders, field visit	Extension activities Farmers production and impact
Tues 28	AM Presenttitions and review trip PM travel BMV – HMC	Histories and strategies used Bank policy towards fattening Traders cooperative linkages with farmers
Wed 29	AM Free in HMC PM HMC – VTE (arr VTE 1700 hrs)	-

Table 4.17 TOR for External Assessments

Terms of Reference CBSLSP (ADB 4406 Lao)

RE: Assessment of capacity of 'trainee' staff in extension of livestock production

BACKGROUND

The CBSLSP (ADB 4406 Lao) has conducted a coordinated program of capacity building for 24 DAFE0 staff in the first cohort of 6 target district for the Northern Regions Sustainable Livelihoods through Livestock Development Project (NRSLLDP). This capacity building program has consisted of:

- (a) series of workshops to introduce technical knowledge and working methods
- (b) mentoring from experienced staff in livestock extension to instill professional commitment and support them in facilitation skills
- (c) networking between districts on a provincial basis (where possible) to provide peer support and initial a problem solving attitude

This program began effectively in April of 2006 and staff have applied their lesson in the field now for two seasons, over a period of 18 months. These staff are to provide the basis for continued extension for livestock production in their districts once the NRSLLDP begin in January 2008.

Livestock extension is a challenging task as it involves issues of feed, animal health and management. Eventually for farmers to gain impact will require that they significantly change the system of livestock production from traditional free range systems, to confinement and management of their livestock, (cattle, buffalo, pigs and goats). The period for capacity building for such a challenging extension activity is thus fairly short.

While no baseline assessment was done of staff capacity, from a general experience of DAFE0 staff who have not had previous project involvement, it can be assumed that their technical knowledge of many aspect of livestock production was non-existent or very low, and similarly for their skills in conducting village meeting and working directly with farmers.

OBJECTIVES OF THE ASSESSMENT

The assessment should not assess capacity in an absolute sense, but do this in relation to their expected duties to be supported by the NRSLLDP.

- 1. Assess whether the staff will be able to expand activities they have gained experience in to additional villages within the NRSLLDP**

These duties consist of :

- (f) Identify farmers' existing constraints with livestock production and thus suitable entry points
- (g) Help farmers to establish forage areas and the use of this to feed animals, as

- the first step to towards improved management of their livestock
- (h) Understand basic animal health problem, and ways that these can be treated
 - (i) Able to identify pragmatic improvements in livestock management, and ways that these can be introduced to farmers
 - (j) Understand how to assist farmers to assess market requirements and how farmers can improve their production to leverage these opportunities.

These functions will require a range of both technical knowledge and communication and facilitation skills. The assessment should distinguish between the capacities of staff in each of these, where possible. The assessment should also taken be aware of the range of experience and education that the different staff have had, and whether this has affected their capacity development.

2. What areas they still have some weaknesses and will thus require additional training.

Given that the period of capacity building has been short and that livestock extension is a challenging activity, it is likely that staff may require further training to reinforce some aspects of their knowledge and skills needed, or that there are aspects which have not yet been introduced.

CONSULTANTS DUTIES

In the process of the assessment, the consultant should

- 1) Consult that relevant project documents and report particularly the Inception (Feb. 2006), Interim (January 2007) and Informal Progress (August 2007) reports.
- 2) Join the Trainee 4 workshop (Luang Prabang Sept 19-21) for one day (Sept. 21) to meet all trainee staff and conduct a participatory assessment processes.
- 3) Visit at least 2 districts to observe staff performance in the field and their interaction with farmers.
- 4) Consult with the supervisors of the staff and their peers for third party assessments
- 5) Consult with Dr Somphanh (DDG Dept. of Livestock and Fisheries) and Dr Syseng (NPD for the NRSLLDP) for a description of the expected roles and functions of the staff
- 6) Consult with staff of CBSLSP, for background information on implementation of capacity building interventions

The consultant will be responsible for design of the assessment tools to be used.

The outputs from the consultant will be:

- 1) Preparation of a brief report in Lao language. This report will address the 2 key objectives describe above. The report should also comment on how the different components of the capacity building (i.e. workshops, mentoring and networking) have contributed to the staff capacity as observed. (draft to be submitted to CBSLSP by November 5).
- 2) Present a synthesis of the results at a project closing workshop at MAF planned for November 16.

IMPLEMENTATION OF THE ASSESSMENT

The project will invite other stakeholders in the assessment, including according to availability

- Dr Werner Stur (CBSLSP / CIAT) to support in technical assessment of technical capacity of staff in regards to forages and livestock production
- Mr. Ngongthong: who will have an on-going role in assessment of staff capacity building and development of livestock extension mechanisms under the Accelerated Impacts research Project (AIRP 2)
- NAFES staff: representative

The provisional program for the assessment will be

Date	Activity	Comments
Sept 20	Travel to LPB (evening)	Dr Silinthone
Sept 21	Participatory Assessment Return to VTN	Dr Silinthone
Oct 28	Travel to XKH (pm)	Joint Teams
Oct 29	Travel to Khoun - field observations	Joint Teams
Oct 30	Travel to Viengthong dist.	Joint Teams
Oct 31	Field observations	Joint Teams
Nov. 1	Travel to Phonesavanh	Dr Silinthone
Nov 2	Writing + return to Vientiane	Dr. Silinthone
Nov 16	MAF workshop - presentation	Dr Silinthone

**CONTRACT for Services
CBSLSP (ADB 4406 Lao)**

RE: Assessment of Impact Gained from CBSLSP in new villages

BACKGROUND

The CBSLSP (ADB 4406 Lao) has conducted a coordinated program of capacity building for 24 DAFEO staff in the first cohort of 6 target districts for the Northern regions Sustainable Livelihoods through Livestock Development Project, (NRSLLDP). Earlier projects, such as FLSP have often had a high degree of support and presence of TA to ensure delivery and impact. The widespread nature of CBSLSP, in 6 isolated districts across 5 provinces has been a test of the robustness of the technical interventions and thus whether they can be delivered widely within such a project as the NRSLLDP.

Despite this challenge to delivery, preliminary results of the CBSLSP indicate that there has been a high degree of adoption of planted forages, the first step in intensifying livestock production, (30% of households across 24 villages in the 6 districts). In addition to this, it appears that a significant number of HHs have already further intensified their livestock production, including penning of animals and fattening. Such systems have previously taken up to 3-4 years before farmers have been prepared to make such commitments.

While the project is collecting adoption data, (i.e. no of households, area of forages planted), this does not give an indication of the impact this has on (a) production, and (b) livelihoods. While it is not unusual for such impacts to occur so quickly it is worthwhile for CBSLSP to make some attempt to collect this. This will in turn begin to give some indication of how quickly the NRSLLDP is likely to

By examining the context for where impact has emerged and where it has not, the assessment will also provide some indication of any obstacles that farmers face in livestock development. Such constraints may then assist the NRSLLDP in providing necessary support.

OBJECTIVES OF THE ASSESSMENT

The assessment should not assess capacity in an absolute sense, but do this in relation to their expected duties to be supported by the NRSLLDP.

1. Identify and describe the changes in production systems that farmers have made in a number of representative sites.

These changes may consist of :

- (k) The sources of feed, management of the animal (supervision penning etc.) animal health and breeding. This changes should be considered across the seasons
- (l) Relate the changes that have occurred to any physical or social conditions. Such conditions may vary from village to village, but may also vary between households within a villages (i.e. richer and poorer households, male and

female farmers, etc.).

Comment on any ways that might assist farmer to overcome constraint observed.

2. **Where households have made significant changes to their production, assess the effect this has had, or potential to have, on productivity and then livelihoods.**
3. Describe how changes in the production systems have affected production, including weight gain, fertility or ability to deliver animal health interventions.
4. Describe how these changes have affected livelihoods, including; improved family nutrition; living conditions; access to school, new economic opportunities.

In assessing improved livelihoods, these may only beginning. However farmers may have begun to have goals for future improvements in their production and how this will affect their lives in the future.

An import assessment of livelihoods is how this may contribute to reduction of shifting cultivation. Key indicators here can be reduction of swidden cultivated. Another indicator is the notional value of the land if farmers wanted to sell for some reasons (i.e. compare value of land if sue for upland rice/maize etc. or land with forages established).

CONSULTANT DUTIES

In the process of the assessment, the consultant should:

- 7) Consult that relevant project documents and report particularly the Inception (Feb. 2006), Interim (January 2007) and Informal Progress (August 2007) reports.
- 8) Review cases studies of champion farmers written by each trainee staff (24).
- 9) Review numerical data of results of extension activities collected by staff in 2007 (i.e. area of forages, livestock management etc.)
- 10) Visit selected villages in 3 sites (Khoun; Viengthong; Phonexay)
- 11) Consult with project staff

The consultant will be responsible for design of the assessment tools to be used.

The outputs from the consultant will be:

- 3) Preparation of a brief report in Lao language. This report will address the 2 key objectives describe above. The draft of this report should be submitted to CBSLSP by November 5.
- 4) Present a synthesis of the results at a project closing workshop at MAF planned for November 16.

IMPLEMENTATION OF THE ASSESSMENT

The project will invite other stakeholders in the assessment, including according to availability

- Dr Werner Stur (CBSLSP / CIAT) to support in technical assessment of technical capacity of staff in regards to forages and livestock production

The provisional program for the assessment will be

Date	Activity	Comments
Oct 28	Travel to XKH	Joint Teams
Oct 29	Travel to Khoun - field observations	Joint Teams
Oct 30	Travel to Viengthong dist.	Joint Teams
Oct 31	Field observations in Viengthong	Joint Teams
Nov 1	Travel to LPB	Impact team
Nov 2	Phonexay – field observations	Impact team
Nov 3	Return to VTN	Impact team

Table 4.18 'Lessons Learnt' Workshop (12 December, 2007)

List of Participants

#	Name	Position	Organization
1	Mr. Aloun Phonevixay	Technician of Secretariat, PSO	MAF
2	Mr. Somsavad Hoamedara	Regularity Division, PSO	MAF
3	Mr. Khamsay Phothideth	Dept . Planning & Coop Div.	MAF
4	Mr. Bounthavy Sayyaphet,	Personnel Dept. Div Head	MAF
5	Dr. Bounkhouang Khambounheuang	Director General	DLF, MAF
6	Dr. Somphanh Chanephengxay	Deputy Director General	DLF, MAF
7	Mr. Chanthaboune Sirimanotham	Head, Planning & Coop Div.	DLF, MAF
8	Mr. Phanthavong Vongsamphanh	Staff., Planning & Coop Div.	DLF, MAF
9	Mr. Khamsone Sivanthong	NAHC	DLF, MAF
10	Mr. Boualy Sengdara	Technician	NAFES, MAF
11	Mr. Viengsavanh Phimpachanvongsod	Planning and Coop Div.	NAFRI, MAF
12	Mr. Phonepaseuth Phengsavanh	L4PP Team leader	NAFRI, MAF
13	Ms Sisavanh Phanouvong,	Project Responsibility/ ADB/ LRM	ADB
14	Mr. Somsack Chandar	Program Officer	SDC Office
15	Dr. Rod Lefroy	Regional Coordinator	CIAT
16	Dr. Joanne Millar	Team Leader	EASLP-ACIAR
17	Mr. Nounthong Sihanad,	National team Leader	EASLP-ACIAR
18	Mr. Neurakhom Thepphanith,	Research Assistant	EASLP-ACIAR
19	Mr. Bounmy Souvannalangsy	DG, PAFO of BK	PAFO BK
20	Mr. Somechanh Mydouangchane	DG, PAFO of LNT	PAFO LNT
21	Mr. Satiene Vannasouk	DG, PAFO of HP	PAFO HP
22	Mr. Somsamone Phalichanh	Rep PAFO of XK	PAFO XK
23	Mr. Bounthane Keoboulapha	DDG, PAFO of BK	PAFO BK
24	Mr. Singthong Souliya	Coord. for BK	PAFO BK
25	Ms. Chemnakhone Phaychith	Coord. for LNT	PAFO LNT
26	Mr. Leechar Xaybinou	Coord. for HP	PAFO HP
27	Mr. Khamphay Phommavong	Coord. for XK	PAFO XK
28	Mr. Sengpasith Thongsavath	Coord. for LPB	PAFO LPB
29	Mr. Kevin Rutter	Technical Advisor	NRSLDP
30	Dr. Syseng Khousy	Team Leader	NRSLDP
31	Mr. Souriyasack Chayavong	Nation Project Director (DLF)	CBSLSP
32	Mr. John G. Connell	Technical Advisor (CAT)	CBSLSP
33	Mr. Bounthavong Khounnavongsa,	Technical staff (NAFRI)	CBSLSP
34	Mr. Sithong Phiphakkhavong,	National Project Director	EU (LFSP)

Workshop Program

Time	Session	facilitators
0800 – 0815	Registration	Secretariate
0815 - 0820	Intorduce objectives of meeting	Secretariate
0820- 0845	Formal opening of meeting	DG of DLF
0845 – 0945	Background to CBSLSP	Souriyasack + John
0945 - 1030	Assessment of staff capacity	Dr Silinthon
1030 - 1045	Break	
1045 - 1130	Assessment of impact	Dr. Chantaboun
1130 - 1200	Suuporting porject – EASLP	Dr Jo Millar (CSU)
1200 - 1330	LUNCH	
1330 - 1400	Market realted issues: - role of Commercial Animal Health Service Providers - need for streamlinging of trade procedueres for iivestock	John Connell (SADU)
1400 – 1430	Disucssion	Dr Somphanh
1430 - 1445	Break	
1445 - 1630	Linkage with NRSLLDP	Dr Syseng
1630	Close meeting	Dr Somphanh

