

Lao Extension Approach (LEA) Activity Impact Study



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Laos Extension for Agriculture Project (LEAP)

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Then there were other support staff at NAFES, such as, Chitpasong Chalath, Head of Extension and Project Coordination Division, LEAP, who was extremely helpful in getting the study started in Saravan and Toumlan. The office ladies, Mrs Khamla, Mrs Sengkham, and Mrs Ninkham were helpful at every juncture.

Many people were consulted the three provinces (Saravan, Xieng Khouang, and Luang Nam Tha), and the respective districts (Toumlan, Khoun and Vieng Phou Khaa). Their advice and suggestions were appreciated very much (listed below in Table A1).

Table A1: Persons Met

Name	Position	Organization
Mr Thongdii Chantavong	Deputy Director	Provincial Agriculture & Forestry Office [PAFO]/SVN
Mr Kiipachanh Phosalii	Director, Extension Center	Provincial Agriculture & Forestry Office [PAFO]/SVN
Mr Kham Oun	Director	District Agriculture & Forestry Office [DAFO]/TLN
Mr Khoua Xayalatin	Director	District Agriculture & Forestry Office [DAFO]/KHN
Mr Phetphouvong Sombandith	Deputy Director	Provincial Agriculture & Forestry Office [PAFO]/XKG
Mr Douangdy Kaliikham	Deputy Director, Extension Center	Provincial Agriculture & Forestry Office [PAFO]/LNT
Mr Cheu Santisouk	Director	District Agriculture & Forestry Office [DAFO]/VPK
Mr Peter Dutton	Director	Friends of Upland Farmers

Then the study team members in each district are listed below in Table A2. Their work was greatly appreciated.

Table A2: Team Members in Districts

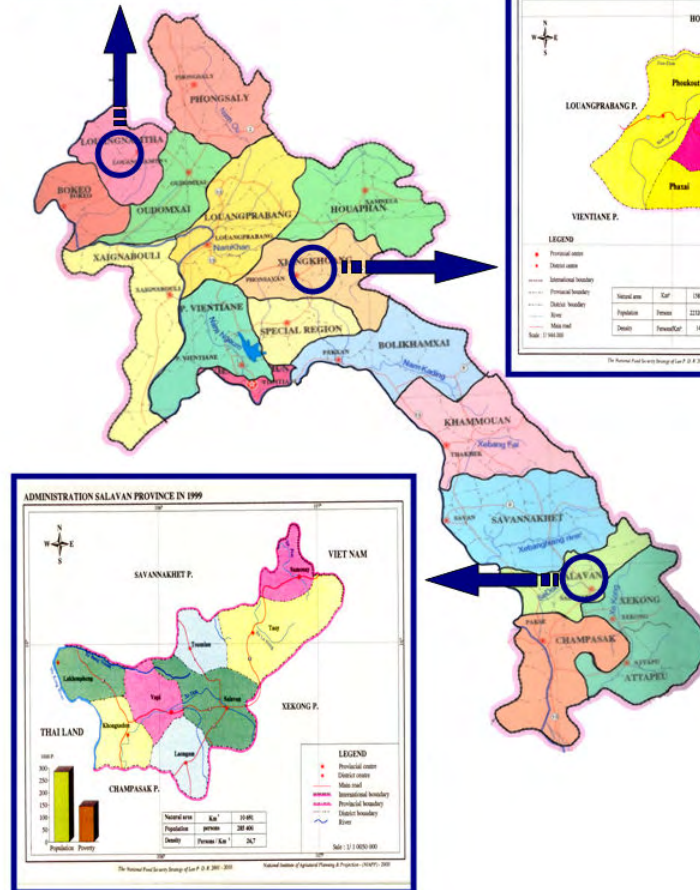
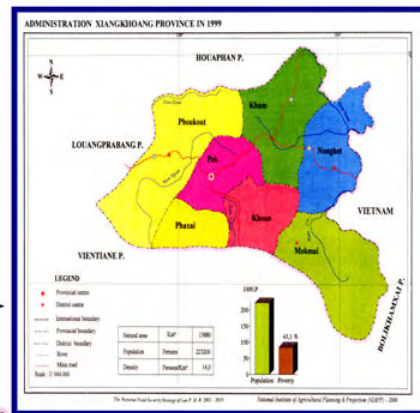
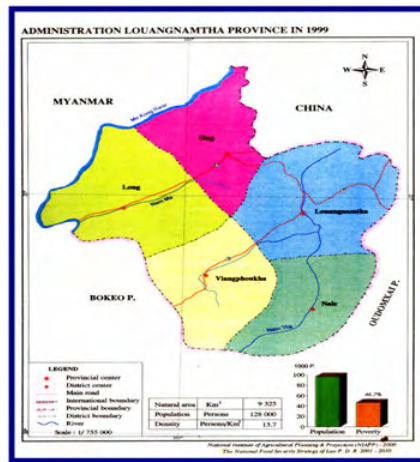
Name	Position	Organization
Toumlan		
Mr Khamson Phaisiikone	extension agent	District Agriculture & Forestry Office [DAFO]/TLN
Mr Aey Saenmeuang	extension agent	District Agriculture & Forestry Office [DAFO]/TLN
Mrs Khamdaeng Deumphanh	extension agent	District Agriculture & Forestry Office [DAFO]/TLN
Mrs Chantavii Khounyotphanya	committee member	District Lao Women's Union [DLWU]/TLN
Khoun		

Name	Position	Organization
Mrs Somsanouk Phommahaxai	committee member	District Lao Women's Union [DLWU]/KHN
Mr Phetphouvong Sombandith	Deputy Director	Provincial Agriculture & Forestry Office [PAFO]/XKG
Mrs Souriphanh Phaomahaxai	extension agent	District Agriculture & Forestry Office [DAFO]/XKG
Mr Philavang Thammavone	extension agent	District Agriculture & Forestry Office [DAFO]/XKG
Mr Siiphonexai (Davone) Kaeomanichanh	extension agent	District Agriculture & Forestry Office [DAFO]/XKG
Mr Vandii Boutavongsii	Deputy Director	Provincial Agriculture & Forestry Office [PAFO]/XKG
Vieng Phou Khaa		
Mr Douangdy Kaliikham	Deputy Director, Extension Center	Provincial Agriculture & Forestry Office [PAFO]/LNT
Mr Sithone Thongsomnit	extension agent	District Agriculture & Forestry Office [DAFO]/VPK
Mr Bounthavy Vipphonxai	extension agent	District Agriculture & Forestry Office [DAFO]/VPK

Glossary of Terms & Abbreviations

B	abbreviation for <i>Baan</i> – village
DAFO	District Agriculture & Forestry Office/PAFO/MAF
DLWU	District Lao Women's Union
GOL	Government of Lao PDR
GPAP	Governance & Public Administration Reform (UNDP)
GTZ	Gesellschaft für Technische Zusammenarbeit Gmb (German Organization for Technical Assistance & Cooperation)
HHs	households
Khoun	M Khoun, Xieng Khouang
LNFC	Lao National Front for Construction
LNT	Luang Nam Tha
LUP/LA	land use planning/land allocation
MAF	Ministry of Agriculture & Forestry
M	abbreviation for <i>meuang</i> – district
NAFES	National Agriculture & Forestry Extension Service/MAF (at Huay Nyang)
NAFRI	National Agriculture & Forestry Research Institute/MAF (at Dong Dok)
<i>nai baan</i>	village headman
NR{ <i>number</i> }	national road (major land communication arteries throughout the nation)
NTFPs	non-timber forest products
NUOL	National University of Lao PDR
PAFEC	Provincial Agriculture & Forestry Extension Center/PAFO/MAF
PAFO	Provincial Agriculture & Forestry Office/MAF
PLUP	participatory land use planning
RRA	rapid rural appraisal (an extractive tool for outsiders to better plan monitor & evaluate)
SSI	semi-structured interviews
SVN	Saravan
TLN	M Toumlan, Saravan
VDC	Village Development Council
VPK	M Vieng Phou Khaa, Luang Nam Tha
XKG	Xieng Khouang

Map of Study Area



Executive Summary

The purpose of this study was to critically examine the quantitative impacts of activities carried on under the LEA process. The study was undertaken in two parts: 1) a household survey and 2) village level inquiry through RRA techniques. It was carried out from late December 2007 through February 2008 by basically a three person team, two from outside (Dr Charles Alton & Mr Panh Phomsombath) and one Master Trainer from CETDU (Mr Chaleun Daoheuang). In each district local extension agents assisted administering the household surveys with assistance from a key provincial official involved in LEAP implementation. Economic analysis was done through partial budgeting.

Findings

The study found that both original and expansion households benefitted from both rice and chicken training. On average rice cultivating original farm households benefitted by about Kip 2.2m and the expansion households by Kip 2.1m. With chickens the original households benefitted by Kip 1.9m and the expansion households benefitted by Kip 1.1m.

Table 1: Costs of Training Farmers vs Profits to their Enterprises

Activity	Farmer's Imputed Profit [Kip]		Cost Farmer Training [Kip]
	Original HHs	Expansion HHs	
	Kip	Ratio	Kip
rice – Toumlan	2,611,500	9.6:1	1,768,375
rice – Khoun	1,849,083	6.8:1	2,436,917
<i>rice Average</i>	<i>2,230,292</i>	<i>8.2:1</i>	<i>2,102,646</i>
chickens	1,978,113	7.2:1	1,063,579
<i>overall Average</i>	<i>2,146,232</i>	<i>7.9:1</i>	<i>1,756,290</i>

The cost effectiveness from only one year of the rice training for original households amounted to about 8:1. In fact the real effectiveness would have a multiplier effect of about 30:1 over a four year life of project.

Recommendations

1. Cost effectiveness of training can probably even be better than the findings reveal with some of the qualitative recommendations which follow, such as improved diagnosis and design, improved tailoring of activities to farming/livelihood systems, ethnic awareness, etc.
2. The extension system with the Project's assistance will have to better communicate socio-economic information to both extension staff (ie, extension agents) and to farm households in a more simpler readily understandable format. This means what we call farm management tools, such as enterprise analysis, where there is farm and enterprise budgeting with the emphasis on costs and returns.
3. There has to be a clear resolve within the extension system to incorporate baselines and other periodic assessment into the Project systems. In addition to Project needs this impact data has to answer questions which MAF policy makers and donors may ask. In fact, the new system to be designed should be a **prototype** for a wider NAFES impact assessment system for which all projects have to use (of course modified for their own requirements).
4. It is highly recommended to keep impact assessments separate from the regular M&E activities.
5. Special outside impact assessment teams should be established from the beginning and continue throughout the life of the Project. Perhaps they could come from NAFRI or NUOL. However, it is important that there be a permanent member of the team from NAFES. The problems in the process of data collection from past experience need to be incorporated from the beginning.
6. It's recommended that sampling reflect other key factors (not necessarily limited to the following): agroecosystems, households in three socio-economic categories, ethnicity, gender, and other key issues.
7. In order to increase the reliability of the data and information, it is highly recommended to establish a system of weekly farm record keeping where the recall period would be no longer than seven days. Of course, this would have to be practical with essential farm data. Extension agents would then have to be assigned to collect these records from farm households weekly, collate the data (hopefully on the computer), and undertake some preliminary calculations.

Chapter 1 – Introduction

I. Terms of Reference (TOR)

The TOR for the LEA Activities Impact Study (LAIS) are briefly the following:

1. compile and analyze secondary data and examine all available secondary data to be provided by the project staff;
2. undertake field visits to each of three sites: Toumlan, Khoun, Vieng Phou Khaa;
3. prepare and present an assessment of LEA impacts based on the secondary data and field visits Include impacts on yield, income and – where possible – food security; and
4. make recommendations regarding future data collection and analysis. Include suggestion for development of NAFES M&E system. (See Appendix III for complete TOR).

II. LEA

The Lao extension for agriculture project (LEAP) was initiated in 2002, and its key corner stone has been that of the Lao extension approach (LEA). LEA is comprised of a structure of the combination of the government extension system and the village extension system (VES), and a process which links the two to provide timely and relevant extension services. The government system operates at three levels, focusing on the district level, which has farm households and communities directly as their clients; which is supported by the PAFO (PAFEC) at the provincial level; which in turn is back-stopped by the central level at NAFES. NAFES interacts in building capacity at each level in responding to farm households' needs and opportunities.

In this LAIS some definitions of terms are in order from the beginning as seen in Table 1.1 below.

Table 1.1: Definition of Terms in LAIS

Terms	Description
original villages	original target villages, where VES was introduced by DAFO & PAFEC staff
original households in production groups	about 10 farm households, which received direct training from DAFO extension agents
expansion households in production groups	households either in original villages or expansion villages who were not a part of the original production groups, but who later joined the groups
expansion villages	villages for which the DAFO decided to expand the VES on their own, ie, without funds from LEAP
other households adopting (& adapting) technologies	in either original or expansion villages households, who adapt technologies through exchanges, but do not formally join production groups
imputed value of product	real value of product or product price x quantity
imputed profit	real profit of the enterprise or real value of product - production costs [real gross margin]

A. VES Process

The operation of the VES involves a cycle (or process) of activities:

5. general assessments;
6. training needs assessments [TNAs];
7. production group [PG] organization & training;
8. activities implementation, regular coaching & follow-up;
9. seasonal evaluation;
10. with success in village farmer exchanges occur and interested farm HHs are

identified to select expansion HHs; and
11. finally an extension plan & VEW is established.

This introductory village assessment leads to the formation of production groups who carry out learning 'projects'. For example, about 10 households might form a production group to learn about chicken rearing, or 8 households might form a group with a common livelihoods interests to learn about say, improved rice cultivation. Then after a training needs assessment (TNA) training is given prior to learning activities, which are carried out by these production groups with the objective of solving a particular problem and/or learning about particular techniques.

Each learning 'project' usually lasts one or two seasons, during which the members of each production group hold regular meetings and try techniques on their own farms. At the village level formal and informal leaders take a leading role in planning and organizing local development activities. After completion of the first learning 'project' at the end of the first year village extension workers (VEWs) are designated from the groups membership to facilitate extension activities in collaboration with extension staff from the DAFO. These VEWs are actually key farmers with interest and local expertise in certain livelihoods activities.

Staff from DAFO and PAFO provides new groups with advice. Later, this role can be performed by village extension workers. The members of production groups monitor their own progress. Additional activities such as farmer exchanges are carried out to ensure the spread of benefits within the village and between villages. The DAFO extension agents then facilitate this learning experience, providing training and advice. They are brokers of change (so-to-speak), providing the link between the government and the village extension systems.

III. Location of Study

All three study districts are part of the original 47 poverty districts designated by the Committee for Planning and Investment in 1997. LEAP began activities in Toumlan during Phase I in 2003. Then Project activities were initiated in Khoun early in Phase II in 2005 and in Vieng Phou Khaa later in 2007. In all cases the GOL extension system, after a systematic assessment process, provided training in the LEA process and techniques before hand by DAFO extension agents . Then with expansion to new production groups key farmers in the village extension system (VES) who had been trained by DAFO extension agents in cooperation with LEAP then disseminated technologies.

These study districts were chosen since they are viewed by Project personnel as exemplary in applying LEA and its technologies. Then, in turn, the DAFOs in the respective districts selected three villages which they thought were representative of a successful effort. Some of the villages were original and some expansion villages.

Chapter 2 – Methods of LEA Impact Study

I. General

It is the purpose of this study to determine the quantitative impacts of the Lao extension approach on farm households and where possible to examine qualitative factors which put these numbers into context. This LEA Activities Impact Study [LAIS] had a severe time constraint and thus it will have to be done utilizing existing data to it's best and to gather as much data in the designated 15 days (including travel) for field work.

A. Data and Information

The Project has a considerable amount of secondary data in hand as seen below in Table 2.1.

Table 2.1: LEAP Secondary Data on Impacts

Data	Year	Comments
Project reports and M&E system	2003-07	good intentions, but data not regularly recorded and not easy to access
from end of Phase I	2004	incomplete
NUOL student research papers on 4 districts [Toumlan, Pak Ngeum, Khoun, Nam Bak]	2005/06	varying quality, uses unconventional economic terminology, thus is confusing
attempt to analyze data as part of M&E exercise	2006	not very successful

For the purposes of this LAIS as much data as possible from the Project's M&E system was used. Of course, in Toumlan, a Phase I district this data was gathered in 2003 or so and was stored away in the DAFO and not very accessible as was the case in Khoun. Whereas, the data in Vieng Phou Khaa was less than a year old and quite accessible. Of course, Vieng Phou Khaa with its improved data collection techniques and procedures has benefitted from five years of Project experience elsewhere.

The primary data gathered by the team was of two types: 1) a survey of selected households of group and non-group members; and 2) village level RRA from village development council (VDC), respected elders (*naeo hom*), and women.

B. Sample Selection

The LAIS uses a purposive sampling framework, emphasizing districts and villages which have successfully implemented the LEA processes, mechanisms, and training of both extension officials and farm households. These three district were selected by the Project as good examples of the LEA process for Phase I and early and later Phase II.

In all three districts, the study investigated three villages¹, some of which were original villages, ie, those who were targeted as a result of the LEA process and the Project funded training and other activities, and expansion villages, ie, those villages where the DAFO undertook the process on their own. If possible one expansion village was investigated in each district. (Table 2.2 below lists the villages by type.)

Table 2.2: Villages Investigated

Village	Village Type	Activities	Year Began	Comments
Toumlan				
B Non Savang	original	chickens rice	2003 2005	diffusion to other HHs diffusion to other HHs
B Done Boung	expansion	rice	2006	DAFO trained on own
B Din Dak	expansion	fish chickens	2007 2006	DAFO trained on own DAFO trained on own, but not yet practiced
Khoun				

¹These villages were all selected by the DAFOs as best examples of their extension effort.

Village	Village Type	Activities	Year Began	Comments
B Kosii	original	chickens	2005 2006	diffusion to other HHs
B Dong Dan	original	pigs rice	2005 2006	diffusion to other HHs
B Dok Mai	expansion	chickens	2006	GPAR funded, DAFO trained
Vieng Phou Khaa				
B Nam Faa	original	chickens	2007	to early to see diffusion to other HHs
B Nam Ngeun	original	chickens	2007	to early to see diffusion to other HHs
B Nam Singh	original	chickens	2007	to early to see diffusion to other HHs

The ten households (HHs) were stratified according to socio-economic categories designated in most every district of the country, eg, better-off, mid-level, and less well-off.² In fact the lower portion of the latter category is what villagers refer to as being poor. Then subsequently the team sampled six of the ten households (2 in each socio-economic category) in the original production group, which was assessed for training needs (TNA) received LEA training, established a village extension system [VES] and initiated production group activities in improved rice cultivation, improved chicken rearing, and improved pig rearing.

C. Study Team

The study team in each district consisted of:

- an external team: a socio-economist (Charles Alton) and a rural sociologist (Panh Phomsombath) ;
- a Master Trainer of the LEAP central level team from NAFES (Chaleun Daoheuang) and in one case a member of the PAFO provincial team;
- three extension agents from the district DAFO; and
- a member of the District Lao Women's Union Office.

Table 2.3: Schedule of Field Work

Dates	Location	Comments
2-7 Jan08	B Non Savang, B Dong Boung & B Din Daak, M Toumlan, SVN	Dist & Prov; VDC RRA; HH survey
13-18 Jan08	B Kosii, B Dong Dan, B Dok Mai, M Khoun, XKG	Dist & Prov; VDC RRA; HH survey
22-27 Jan08	B Nam Faa, B Nam Ngeun, B Nam Singh, M Vieng Phou Khaa, LNT	Dist & Prov; VDC RRA; HH survey

D. Study Process

The external team undertook the investigation of village level information with the village development council (VDC), including village elders about the LEA new technical innovations, economic and social benefits, and the assistance received from the DAFO extension agents undertaken and their impact on the village economy and culture. Traditional RRA and semi-structured techniques were used for the village level data.

Meanwhile extension agents from the DAFO/extension section met with original and expansion groups of farm households who had activities in rice, chickens, and pigs. They surveyed these groups eliciting costs and returns data concerning their respective enterprises. This data emphasizes the current costs and returns in 2007 accordingly. There

²Households criteria used by VDC's includes: area of paddy land, rice self-sufficiency, numbers of large livestock, condition of house, etc.

was attempt to get costs and returns from before LEA activities by looking at farm households without training as proxies for the before situation with the original farm households. As much as possible two households were interviewed from each socio-economic status of villagers, ie, well-off HHs, mid (or average) HHs, and less well-off HHs³. This same survey process was be used to gather data in expansion groups and villages from the HHs who later adopted these practices through the system of the VES and farmer-to-farmer dissemination.

In the earlier districts, especially Toumlan (and in Khoun to a lesser extent) activities, we had to collect so-called *before* LEA training data from non-participating (*without* training) households in the same (or nearby) villages. Of course, data from some of these households is somewhat biased since many of them have already been a part of the informal diffusion process. The costs of production data from either the NUOL student's or nearby villages in the same *koum* were used as proxies *before* LEA training to be superimposed on the original village since the memory recall period for the expansion villages is a much shorter period⁴.

Actually, Vieng Phou Khaa was the only district for which there was data on *before* and *after* LEA training. Of course, this district was one of those added in the latter part of Phase II and has benefitted from the lessons learned by the Project elsewhere. In addition it allowed us to obtain better data and information from both HHs and at village level due to memory recall of less than one year.

In general there will be two types of analysis of the data. First and foremost is the quantitative data of the costs and returns of the technologies gathered from original and expansion farmers and where necessary from other secondary data of farm households (such as from NUOL student's senior papers) without LEA training. And secondly is qualitative data gathered from village development council (VDC) formal leaders and from informal leaders, such as respected elders (*naeo hom*) and women from the village women's group.

II. Quantitative

The quantitative data was elicited from a survey questionnaire designed by the Project early on in Phase I. At first, we tried to modify this survey instrument, but then it was deemed to confusing to the local DAFO extension agents who were used as enumerators.⁵

A. Economic Analysis

In this study a simplified version of partial budgeting is used to economically analyze the potential quantifiable benefits of adoption of the new technologies.⁶ This was adapted to fit the situation in LEAP.

Economic analysis, based on what has commonly been referred to as partial budgeting (enterprise budgets), will be used as an analytical tool. With this tool new production patterns (new innovations) can be compared with traditional production practices. These budgets can be used to:

- compare the economic profitability of farm activities or enterprises;

³Actually a subset of this third category is the lower portion of HHs, for which villagers classify as being poor – not necessarily the same as how outsiders classify them.

⁴As compared to 2-3 years for the original groups in Toumlan.

⁵So there was a capacity building element in this whole exercise.

⁶Actually this partial budgeting should be part of an overall adoption study whenever that may be required by the Project.

- suggest whether a change a (a new technology) will be profitable under a given situation; and
- explore possible conditions which will make farming practices more profitable or otherwise.

Such partial or enterprise budgets evaluate the costs and returns of production processes and techniques in order to compare them. Such budgets begin with the costs, that is *variable* (short-term recurrent or operating) expenses and *fixed* (overhead or longer-term capital investment) costs. Fixed costs are incurred even if there is no production, including chicken or pig pens depreciation and their maintenance, farm tools, etc. Variable costs relate to a production enterprise and vary according to their production level, which farmers control or change their level of use. Examples of variable costs relate to such input use are: labor for land preparation, planting harvesting or in animal rearing; the amount of fertilizer, pesticides, feed, medicines used; animal or machine power used; and transport used. Input costs are determined by multiplying the quantity of input used by its unit price.

Table 2.4: Partial Budgets to Assess Enterprise Changes

Costs		Benefits	
Negative side of proposed change		Positive side of proposed change	
added costs		added returns	
reduced returns		reduced costs	
<i>Subtotal</i>		<i>Subtotal</i>	
Estimated change = positive - negative			

The *gross returns* are the value of the new output (quantity x output price). There are two measures of net returns, eg, gross margin and the returns above all costs. The difference between gross returns and variable costs is what is commonly referred to the *gross margin*. It is sometimes referred to as returns above cash costs. This gross margin indicates an enterprise's (or new technology) contribution to farm profitability. In the returns above all costs it includes the opportunity cost of household labor which is deducted from gross revenues.

III. Qualitative

In fact, quantitative data by itself is like having a the bones of a skeleton. One has to put meat (qualitative information) on these bones in order to make complete sense of the phenomena at hand.

A. Farming (Livelihood) Systems

First of all, LEA activities, which directly affect certain farm household enterprises, must be considered within the context of their overall farming (or livelihoods) systems (FLS). These FLS are comprised of components such as cropping, livestock, fisheries, household resource management, and natural resource management and their respective enterprises. This FLS also includes household resources, including: human resources (by gender and by age groups); land resources (area by type of activity, soil suitability, etc); water resources, etc. It also includes linkages of production systems with marketing channels.

These FLS of course have to be examined within the context of their respective agroecosystems. Such agroecosystems already include bio-physical, socio-economic as well as institutional factors.

It almost does not need to be stated, but household livelihoods activities must be viewed within the context of the community and perhaps neighboring villages. This is largely has to do with the overall livelihood systems of the village itself. Households cooperatively use and compete for common lands, water and forest resources. Thus, we examine briefly village level information supplied by the village development council (VDC), respected elders (*naeo hom*) and women.

B. Institutional Factors

There are certain institutional factors and issues related to the very nature of these technologies, to the GOL delivery system, ethnicity and social system, commercial agriculture, etc. Observations on these will be presented in Chapter 4.

Chapter 3 – Study Findings

In this LEA Activities Impact Study (LAIS) three improved technologies were studied which were disseminated through the LEA process by the extension agents in the respective DAFOs, eg, rice production, chicken rearing and pig rearing. The diffusion and adoption (to whatever extent) of these technological innovations is dependent upon a number of factors, including first and foremost: farm household real needs, appropriateness of the innovation⁷, ethnicity, the agroecological setting and livelihood systems of farm households. Where possible, we will attempt to present the sample villages together across districts, emphasizing similarities and pointing out differences.

IV. Diffusion of Rice Technologies at Household Level

Following on to the training needs assessment and other steps in the LEA process, which hopefully respond to farm household's needs. Improved rice production technology was selected by three villages: B Non Savang and B Dong Boung in M Toumlan, Saravan and B Dong Dan in M Khoun, Xieng Khouang.

Rice extension activities began in 2003 B Non Savang with ten households – mostly men being trained. Then later this rice technology was diffused to other households in the village. Then in B Done Boung, an expansion village, rice technologies were disseminated by the DAFO extension agents in 2006 to ten households without the assistance of LEAP. The rice dissemination began in B Dong Boung in 2006. Since then no other rice groups have been formed but there has been some spontaneous adoption by other households as in B Dong Dan in M Khoun.

As we examine the household data we can draw some interesting conclusions here. Clearly both the original and expansion villages have benefitted from improved rice technology in all summary measures. In M Toumlan in calculating the before LEA training scenario, we used the rice production costs before training of B Done Boung⁸ as a proxy for those production costs of B Non Savang for the before situation for both original and expansion households. In Table 3.1 the figures reflect the net benefits to the households of after training *minus* those of households without training. Original households increased their yields (over their before situation) by an average of 0.71 tons per hectare and their production by 760 kilograms. In value terms the production costs after training were Kip 704,333 less than the farmers without training in B Done Boung. The value of their rice product was Kip 1,072,000 and imputed profit Kip 2,611,500 greater than those without training.

Table 3.1: Toumlan Rice Households Net Benefit from LEA Training

⁷Appropriateness includes such factors as profitability (in real if not monetary terms) and compatibility of the new innovation to the technique is mean to replace in form, meaning and function.

⁸All these three villages in Toumlan are in fact in the same village cluster area (*koum baan*).

Difference				Prodn	Total	Imputed	
After - Before	area	yield	prodn	Costs*	Value	Profit	
Village	(ha)	(t/ha)	(t)	(Kip)	(Kip)	(Kip)	Comments
Non Savang							
original	0.00	0.71	0.76	(704,333)	1,907,167	2,611,500	<==Direct Benefit
expansion HHs	0.00	0.53	0.43	(2,069,333)	1,072,000	3,141,333	
Done Boung							
expansion HHs	0.00	0.11	0.20	111,500	506,917	395,417	
Average exp HHs	0.00	0.32	0.32	(978,917)	789,458	1,768,375	<==Secondary Benefit
Difference							
orig - expansion	0	0.39	0.45	274,584	1,117,708	843,125	

* production costs are those from B Done Boung superimposed on B Non Savang @ constant 2007 prices

Similarly, the average of the two expansion groups was greater in both yield (0.32t/ha) and production (0.32 t) than the households without training. Interestingly, their costs of production were Kip 978,917 less than the without training group, but their imputed value (Kip 789,458) and imputed profit (Kip 1,768,375) were greater than the households without training households.

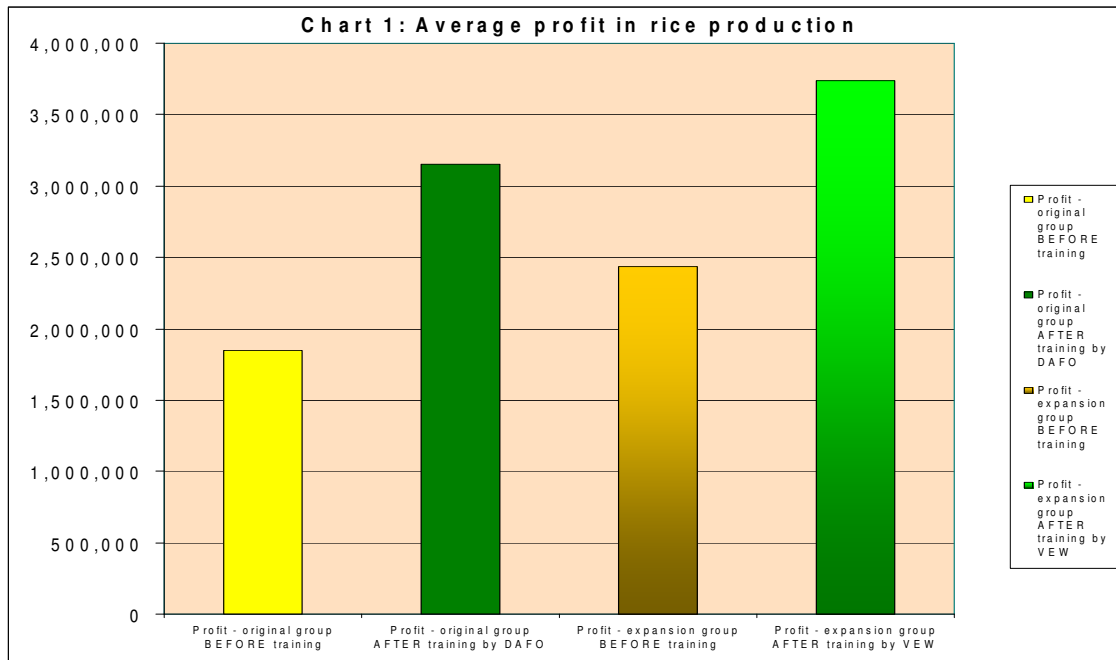
But in the case of rice in B Dong Dan (Table 3.2) in M Khoun the net effect between original households (with training) and the average of the student's study before (without training) was greater in all measures: total value (Kip 3,521,667), production costs (Kip 1,672,583), and imputed profit (Kip 1,849,083). Again, comparing expansion households and student's study baseline, all measures are greater by: total value (Kip 4,481,667), production costs (Kip 2,044,750), and imputed profit (Kip 2,436,917). And we can readily see that the expansion households fared better than the original households in all measures.

This is seemingly quite a tribute to the village extension system (VES) and its key farmers who organized and trained with assistance from the DAFO extension agents. It seems to have been adapted to farmer's conditions, with both expansion household groups and other spontaneous households, especially when we see the reductions in production costs.

Table 3.2 M Khoun Rice Households Benefit from LEA Training [constant 2007 prices]

B Dong Dan	Total	Prodn	Imputed	Comments
	Value	Costs	Profit	
	(Kip)	(Kip)	(Kip)	
Student's BEFORE	2,098,333	797,000	1,301,333	
expansion HHs	6,580,000	2,841,750	3,738,250	
Original HHs	5,620,000	2,469,583	3,150,417	
original HHs - BEFORE	3,521,667	1,672,583	1,849,083	<== direct benefit
expansion HHs - BEFORE	4,481,667	2,044,750	2,436,917	<== secondary benefit

See Chart 1 below for a graph of imputed profits of rice for original and expansion HHs.



A. Observations & Farmer Comments on Rice Cultivation

Do you have some methods to overcome natural phenomena, such as drought, floods, ...

Village elder in B Done Boung, Toumlan

1. After the LEA training in Toumlan and Khoun the VDCs and group members all agree that the LEA technique for rice improvement is good resulting in increased yields. Farmers in both districts felt that they had received good lessons from improved rice techniques, which increased their confidence and motivation.
2. In Toumlan farmers felt that if they could only increase yields to 2.5 tons/year, they wouldn't have a rice shortage. In B Dong Dan (M Khoun) where there was ample rice previously, now rice self-sufficiency is difficult because of so many in migrants, and paddy land is limited.
3. Farmers in both districts understood that the need for fertilizers (either chemical or natural) to improve their worn out soils. However, if they used chemical fertilizer then they had greater insect infestation than with natural fertilizers. There would be little increase in production costs if manure were used more than before.
4. One village elder in Toumlan held the opinion that the new knowledge doesn't counteract natural forces such as flooding drought, and insects resulting in rice deficits in some years. This frustration probably expresses the need for more emphasis on pest management, especially IPM since it would utilize lower cost inputs.
5. Some training topics seemed difficult for farmers to understand, such as improved varieties, soil improvement, seedbed preparation, cultivation techniques. Both districts expressed the need for more on-farm demonstrations and in-field practicums to accompany training.
6. New rice cultivation techniques require land leveling in the nursery plots and more even transplanting, but this requires more labor. The ten expansion households in B Non Savang have partially adopted this component of the technologies as have the households in the rice expansion village of B Done Boung.
7. One person in Toumlan even mentioned that longer stalked varieties can be used in lower paddy and perhaps are shorter duration varieties. Likewise several farmers in Khoun expressed more interest in local varieties, which they are never used before. *They seemed not very interested in the high yielding varieties.*
8. B Nam Faa has gone from swidden to sedentary cultivation in the time of 25 years. This may be one of the few villages in Lao PDR who have accomplished this.

II. Diffusion of Chickens Technologies at Household Level

The improved chicken rearing technology was utilized in seven of the nine sampled villages. Chickens have long been an important part of village livelihood systems, contributing as: a protein source for the diets, a role in ritual sacrifices, and finally as a source of cash income. Again, we will examine original groups versus expansion groups.

Referring to Toumlan and B Non Savang as an early village, the wives of members of the rice production group were formed into a chicken production group. The formation of chicken production groups perhaps were formed a little differently elsewhere. But basically these groups were comprised mostly of women.

Both the original and the expansion groups have clearly benefitted from the improved chicken technology.

On average production costs for both the original (Kip 190,831) households and the expansion (Kip 185,546) groups more than the before situation. As for imputed value of the chickens the original (Kip 1,461,926) households and the expansion (Kip 1,249,125) households be all greater than the before training. And with imputed profit the original (Kip 1,978,113) households and the expansion (Kip 1,063,579) households are considerably greater and these both represent the benefits to the training.

However, the outcome is virtually the opposite of that with improved rice technology. The original groups had much lower death numbers than did the expansion households (see Appendix IV). We are not really sure what the death rates were in the student's baseline households, however, it was reported by the VDCs that this was in the neighborhood of 80 percent. With the other physical measures, eg, increase in output, increase in consumption, and increase in number of chickens sold were all greater for the original groups. This success of the original households undoubtedly relates to their closer following of technical recommendations, especially the timely inoculations of baby chicks within their first week and then confining them to nursery pens.⁹

Table 3.3: Chickens Benefit to LEA Training

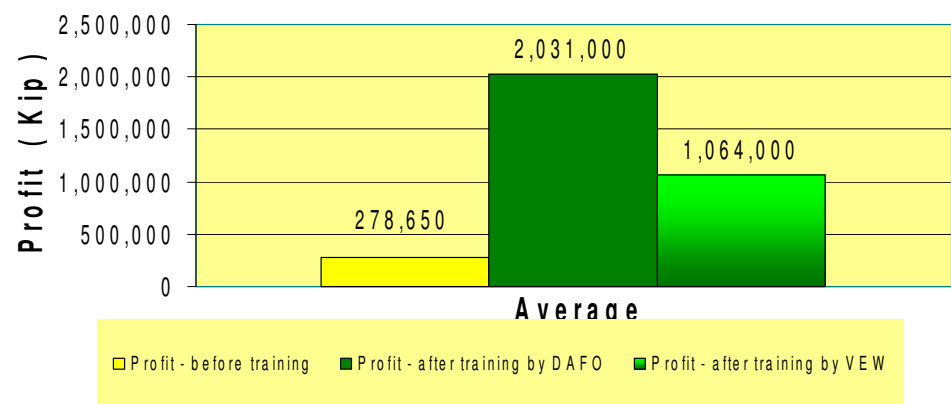
Chickens Benefit	Original Groups			Expansion HHs		
LEA Training	prodn	imputed	imputed	prodn	imputed	imputed
	costs	value	profit	costs	value	profit
	avg	avg	avg	avg	avg	avg
Differences	[Kip]	[Kip]	[Kip]	[Kip]	[Kip]	[Kip]
Toumlan [avg survey - students]	159,683	1,922,500	1,762,817	87,767	996,250	908,483
Khoun [avg survey - students]	296,700	3,373,500	3,076,800	283,325	1,502,000	1,218,675
Vieng Phou Khaa [After - Before]	116,111	(910,222)	1,094,722			
<i>Average</i>	<i>190,831</i>	<i>1,461,926</i>	<i>1,978,113</i>	<i>185,546</i>	<i>1,249,125</i>	<i>1,063,579</i>

It must be kept in mind that Vieng Phou Khaa is the only district where we could compare the before and after situation of the same farm households.

See Chart 2 below for a graph of imputed profits for chickens for original and expansion HHs for the combination of M Toumlan and M Khoun. The data for M Vieng Phou Khaa would not allow this since there were no expansion households yet.

⁹At present time there is another outbreak of Asian influenza (AI) in Laos as well as Luang Nam Tha.

Chart 2: Average profit chicken production



A. Observations & Farmer Comments on Chicken Rearing

1. Now there are a lot more chickens in the participating villages than before LEA training. Now household income depends on chickens. They use this cash to buy rice and cotton yarn to make into skirts to sell. Before LEA chick mortality was about before death rate 70-90% and large chicken death rate (50-60%). Now after LEA training chick mortality has been reduced to 20-50%. The is vaccine cost Kip 18,000/50 chicks. It is not sure how much large bird mortality has been reduced. *Some farmers expressed that the cost of vaccines was prohibitive. In fact, the sale of one bird can pay for the cost of vaccinating the entire flock. The real reason is that some farmers are not convinced of the utility of the technique.*
2. Most villages relate shortages of foodstuffs for chickens with the increased numbers related to reduction in chick mortality¹⁰. *There seems to be an opportunity for extension to promote the utilization of local feedstuffs in order to reduce the need for purchased inputs.*
3. Farmers related that they had few labor problems in rearing chickens. Many farmers said they would like to raise as many as 20 hens if they could. No matter what the ethnicity of farm households, chickens are mostly raised by women and girls. *In fact, any household labor constraints relate mostly to the availability of women's labor for the potential expansion of chicken rearing.*
4. Most problems with chickens are disease medicine. While many farmers appreciate the vaccinations, they would like to know more how to mix and match scientific solutions with traditional means, eg, *kheua kha ho* plus water, neame and other herbal ingredients. *This use of locally available herbs is another opportunity for extension training concerning chicken health.*
5. The cost of chicken and nursery pens at first seems to be prohibitive. For 50-60 birds pens built accordingly [10m x 20m] cost less than Kip 300,000. *Actually here there is not a complete understanding of the function of either nursery or adult chicken pens in the isolation birds from diseases and predators.*
6. Farmers like chickens because of the high turnover rate, selling between 3-6 months. *Of course, this is not unusual with farm households who are still mostly subsistence oriented. Small livestock are still most relevant to these small-holders who are at the early stages of commercial agriculture.*
7. In all villages farm households have raised livestock for years and are interested in continuing and improving this. *However, for new technologies, such as for improved chicken rearing, they are interested but perhaps unrealistic in their expectations. For example, they couldn't understand why still many chickens died even though they had vaccinated them. When in fact, they didn't follow recommended practices of confining chickens to pens or perhaps not hurrying to vaccinate chickens in order to preserve vaccine viability. Additionally, with rumors of avian influenza they thought chickens may die anyhow.*

III. Cost Effectiveness – Extension Training

¹⁰Ironically, many villages now report that thievery of chickens is a problem, especially with villages close to a main road. In some villages they state the recommended practice of raising chickens in paddy fields after the WS harvest is highly risky to thieves. *This in fact may relate to their lack of providing security for these birds.*

Cost effectiveness of extension training of the original farm households is very clear. In comparing the costs of training a single farmer is more than covered by the benefits in the first year (see Table 3.4 below) for either rice or chickens. These costs of about \$30 (Kip 273,000) per farmer trained covered the entire training process from initial assessments, all the various training sessions, follow-up, etc, for the entire first year amounted to this figure.¹¹ The ratios stated in the table are the benefits to farm households, in terms of imputed profits, to the cost of training.

Table 3.4: Costs of Training Farmers vs Profits to their Enterprises

Activity	Farmer's Imputed Profit [Kip]		Cost Farmer Training
	Original HHs	Expansion	
	Kip	Ratio	Kip
rice – Toumlan	2,611,500	9.6:1	1,768,375
rice – Khoun	1,849,083	6.8:1	2,436,917
<i>rice Average</i>	<i>2,230,292</i>	<i>8.2:1</i>	<i>2,102,646</i>
chickens	1,978,113	7.2:1	1,063,579
<i>overall Average</i>	<i>2,146,232</i>	<i>7.9:1</i>	<i>1,756,290</i>

Farmers are likely to continue to practice improved technologies in subsequent years – even thought they may be further adapted to their situations. Consequently In the life of a four year project the impact could possibly as high as 30:1.

Chapter 4 – Observations, Conclusions and Recommendations

I. Quantitative Conclusions

Clearly both the rice and the chickens technologies have had a positive impact on the farm households adopting. Then there are also multiplier effects not only to these original households but also to expansion households for more than on season.

Economic Impact

- 1 All three types of villages (whether original or expansion) which the LAIS sampled farm households, who experienced increases in rice yields and total production over what they produced before LEA training. Also all villages experienced very healthy imputed profit to their rice cultivation due to training.

Since all households in the study (and in the country) have rice-based farming systems, there should be continued to have improved rice technologies on the menu of extension technological choices for farm households.

- 2 The impact of extension training on chickens in the seven sampled villages is also substantial. Chick and adult mortality were drastically reduced. There was increased consumption of chickens by most households and increased sales. Also, both original households expansion households experienced increased average imputed profits.

This activity definitely should be on the menu of technological choices because of its benefits and importance to farm households.

¹¹This cost was calculated by the Project and is reportedly all inclusive.

- 3 The cost effectiveness of the extension training for both activities is substantial according to the study. It thoroughly covered the costs of the training incurred by the Project. *Cost effectiveness can probably even be better than the findings reveal with some of the qualitative recommendations which follow, such as improved diagnosis and design, improved tailoring of activities to farming/livelihood systems, ethnic and gender awareness, etc.*

II. Qualitative Conclusions

These conclusions are based on discussions and feedback from the village development council (VDC), respected elders and women with intimate knowledge of livelihood systems, activities and subsequent issues.

Institutional Issues¹²

As water rises and recedes, so does the
lotus flower

Lao Proverb

Technologies, Content and Processes

1. Some rice and chicken topics were difficult for farmers to understand even after training.

May need to do more on-farm demonstrations along with hands-on practicums in tandem with farmer training. Probably will have to demonstrate for each activity in some village in the cluster. Demonstrations should be undertaken in selected villages, which are representative of their respective ethnic group(s) targeted and utilizing their languages (see #2 below).

Perhaps farmers in training have been given the strengths of technologies without the concomitant weaknesses. Extension information needs to be balanced. Some farmers seemed to have over-expectations (or misconceptions) about the technologies, their strengths, weaknesses, and potentials, especially low-input (ie, low-cost) technologies.

2. In this study we sampled among the following ethnic groups: Katang (Mon-Khmer), Tai Phuan (Tai-Kadai), Hmong (Hmong-Mien), Tai Yai (Tai-Kadai), Khmu Tai (Mon-Khmer), and Tai Leu (Tai-Kadai).¹³

Clearly, extension activities have to be tailored to needs and cultural ethos of various ethnic groups. For example, the Katang¹⁴ and Khmu (as part of the Mon-Khmer superstock) seem to be very wary of trusting the advice of outsiders, thus increased on-farm demonstrations are especially appropriate for these groups in at least one village in each cluster (khet) for each type of activity. Whereas, these may not be as necessary for

¹²This proverb shows the interrelatedness of not only plants and their environment; humans and their ecosystems; and human institutions and their social systems. Thus, here the lotus flower represents leadership or management of agencies or communities, and the water levels represent their base or support system of populations or staff. The flower can only maintain its levels because of its base, and conversely the base needs the beautiful lotus to enhance the situation's overall attractiveness.

¹³The parentheses are around three of the four ethnolinguistic superstocks in the Lao PDR.

¹⁴For example in B Din Daak in Toumlan fish culture only *took off* after a local farmer went to look at fish rearing elsewhere and then *demonstrated* it to the rest of the village. Now more than half of the households rear fish.

the Hmong and the Tai groups, who may be satisfied with more traditionally rational evidence.

For any villages selected for demonstrations should have good cooperation with the DAFO and exemplary households should be selected to put on the demonstrations. Obviously, these demonstrations should be in the local languages.

3. Extension activities in some cases may not be as appropriate as possible for real farm household's situations, problems, opportunities, knowledge and skill base.

There is an urgent need for better diagnosis and assessment of farm household's real situations, eg, indigenous knowledge and social systems (ie, ethnicity), household resources (including demands on women), and a practical issues concerning world views as they relate to technical innovations.

4. Many extension agents seem to have commodity or disciplinary approaches to farmers problems and opportunities. As farm boys and girls, as many are, they inherently have a systems view of village agricultural systems. But this practical view has basically been *drummed out* of them in their education and in their orientation to their jobs. Clearly, all livelihood activities will have to be relied upon for food security and to compensate for rice shortages.

A livelihoods/farming systems approach should be included in extension agent (and also subject matter specialists [SMS]) orientations and in-service training. Then LFS approaches (systems thinking) and techniques, such as RRA/PRAs, and others need to be used regularly in diagnosis and design of extension activities. This very much includes economic analysis of activities and from a whole farm perspective if possible.

5. More commercially oriented agriculture is now becoming a viable alternative to farmers as markets start to open and communication access becomes better. In the past households sold what little surplus they had of a commodity. Now they have to respond to demands in proper quantities, with prescribed qualities, and in a timely manner. However, both farm households and extension agents do not seem to fully understand marketing issues in much depth.

There needs to be more, much more training for extension personnel at all levels about markets as an institution, their operation, their psychology, their strengths and limitations, etc. Contract farming and its various arrangements (strengths and weaknesses) need to be understood by both extension agents and farmers. Of course, contract farming needs to be understood within the context of customary law of the various ethnic groups.

6. M Vieng Phou Khaa has done an exemplary job of having an annual (or perhaps even semi-annual) meetings where relevant district government agencies, private sector firms and farmers groups meet to discuss the coming season's needs and requirements.

There needs to be much more of these interactions facilitated for getting farmers, traders and government officials together in other districts.

Miscellaneous

1. If the team were to rank the changes in living conditions in the three districts, the following would result as in Table 4.1 below. These factors influence farm households livelihoods behavior and subsequently their interest in and possible adoption of technical innovations.

Table 4.1: Ranking of Districts by Improvements in Living Conditions

	District	Attributes	Comments
1	Khoun	8. main & feeder roads excellent, ie communications good 9. DAFO staff more knowledgeable, ambitious, and office seems more active 10. food security better, ie, rice sufficiency 11. water supply good 12. health stations available 13. villages had a great deal of equipment, eg, hand tractors, motorcycles, trucks, rice mills	\$ impression of villages on the move to seize opportunities \$ farm households hungry for knowledge & skills \$ district concerned about integration into economic growth of province & how they <i>fit</i>
2	Vieng Phou Khaa	\$ NR3 road excellent, ie communications good \$ DAFO staff more knowledgeable, ambitious, also office active \$ water supply & health station good \$ food security good, ie, rice sufficiency \$ villages quite a bit of equipment, eg, hand tractors, motorcycles, trucks, rice mills	\$ villages beginning to realize they have access & are interested in cash commodities \$ district is quite progressive in trying to attract agribusiness
3	Toumlan	\$ remote area – accessibility difficult \$ extension agents reportedly less active \$ DAFO office seemingly less organized	\$ seems as though villages have progressed but very little \$ impression of district town as an <i>overgrown</i> village

III. M&E and Impact Analysis

Economic Impact Analysis

1. The Project has included quite a good economic analysis with proper extension materials from the beginning, but for some reason this has not been fully utilized by the extension agents.¹⁵ It was clear that they did not understand the materials in much depth.

The Project (and extension system) will have to better communicate socio-economic information with both extension staff (ie, extension agents) and in a more simpler format understandable to farm households. This means using farm management tools, such as enterprise analysis, where there is farm and enterprise budgeting with the emphasis on costs and returns will have be better emphasized and more training given.

Then, of course, the use of these tools should followed-up in their implementation on-the-job carefully by both Project staff and PAFO SMSs responsible for back stopping LEA activities.

As an ancillary to economic analysis is working with farm households on simple farm budgets, which clearly show costs and returns of activities.

2. Many projects merge the gathering of impact data with the M&E data collection system. This is very convenient if it can be accomplished, but the experience of this merger is not very successful. It is clear in virtually all projects, that extension staff, with the exigencies implementation, do not have time to gather impact data on a regular basis.

¹⁵This inadequate emphasis of economics is not unusual in the current young extension system and the previous system from which it evolved with the previous emphasis on socialist production programs.

It is highly recommended to keep impact assessments separate from the regular M&E activities. Special outside impact assessment teams should be established from the beginning and continue throughout the life of the Project. Perhaps they could come from NAFRI or NUOL. However, it is important that there be a permanent member of the team from NAFES.

The problems in the process of data collection from past experience need to be incorporated from the beginning. The outside team would have an input into this process and data needs. However, it must be emphasized that this is a necessary component of the extension system which is based at NAFES.

3. In order to insure relevance of the data Impact issues have to be kept in mind from the beginning of implementation and LEAP attempted to put this in place. However, this data was not readily available to the team.

There has to be a clear resolve within the extension system at NAFES to incorporate baselines and other periodic assessment into its information systems. Then, of course, the Project needs to support the system. In addition, to Project needs this impact data has to answer questions which MAF policy-makers and donors may ask.

*In fact, a new system should be designed as a **prototype** for a wider NAFES impact assessment system for which all projects have to use (of course, modified for their own donor's requirements).*

Perhaps LEAP should organize an effort within NAFES to set up such system in NAFES concerning both impact assessments and normal M&E. Of course, this should not be donor-driven, but according to NAFES' real needs.

4. In order to insure better representativeness of the data the Project will have determine key issues to be gathered as related to various technologies.¹⁶

It's recommended that sampling reflect key factors (not necessarily limited to the following): agroecosystems, households in three socio-economic categories, ethnicity, gender, and other key issues.

5. The team faced the problem of recall of farm households. We can not really expect this data to be very reliable after such a long recall period.

In order to increase the reliability of the data and information, it is highly recommended to establish a system of weekly farm record keeping where the recall period would be no longer than seven days. Of course, this would have to be practical with essential farm data related to the target activities. Extension agents would then have to be assigned to collect these records from farm households weekly, collate the data (hopefully on the computer), and undertake some preliminary calculations. Again, this has to be followed-up by Project staff to constantly mentor extension agents and SMS until they understand these concepts.

6. For quite some time there has been talk of evaluating technologies technically, economically and socially involving both research, extension and farmers. Hopefully, the recent cooperation of NAFRI and NAFES cooperation on the preparation of a para rubber manual will be the beginning.

¹⁶This will be especially valid when the Project will use a more *menu-driven* approach in the next phase.

Clearly this would be an appropriate occasion to utilize impact analyses in this process.

Appendix I: Electronic Files of LAIS Data

The following files are a list of those files related to data and calculations. In fact, these files of tables are distillations of the raw data from the household survey or village level data. Sometimes there are distillations of distillations. Then also included on the CDs is the report and its appendices, along with some pictures taken.

Table I.1: Electronic Files of LAIS Data

	File Name	Description	type
1	Summary of Key Data from LAIS villages 2	basic village data, sources of income, rice self-sufficiency, paddy yields	xls
2	Rice Households Benefit from LEA Training	key rice data from 3 villages in 2 districts: production, yields, improved production costs, imputed value of product, imputed profit	xls
3	Chickens HHs benefit	key chicken data from 7 villages in 3 districts: output, consumption, deaths, sold, improved production costs, imputed value of product, imputed profit	xls
4	LEA Summary HH Activities Vil& Dist const pr07 2	ranges of data on key variables for rice & chickens	xls
5	cash income HHs in LFS VPK 1	sources of cash income for HHs in VPK	xls
6	LEA detailed activities summary 1-1	similar to #4 above	xls
7	Vil sum TLN 1	village level data summaries of 3 villages in Toumlan	xls
8	Vil summary KHN 0	village level data summaries of 3 villages in Khoun	xls
9	Vil sum VPK 1	village level data summaries of 3 villages in Vieng Phou Khaa	xls
10	Pictures [3 districts]	pictures from the 3 districts during the study	jpeg
11	Main Report 8 5 08 w pgs w map w charts 2.6	report and appendices	doc
12	Table of Contents plus for 2-6	TOC + lists + acknowledgements + glossary + map	doc

Appendix II: Context of Technological Innovations

The technical innovations and the extension processes have to be examined within the context of the real world situation of farmers, their communities, agroecosystems, and markets. The following is a brief overview of these for the sampled villages.

I. Overall Farming (Livelihoods) Systems

Again, the overall farming (or livelihoods) systems (FLS) are comprised of components such as cropping, livestock, fisheries, household resource management, and natural resource management and their respective enterprises. These activities (enterprises) are important for livelihoods well-being, ie, food security and income generation. It is only through the combination of these various alternatives that people can survive and prosper. It is the way that they cope with rice shortages.

A. Forest vs Farm

First of all, we should reiterate a phenomena has been observed in most rural Lao villages, that is the heavy dependence upon the forest for food. It is not only a primary source of food as seen in Table II.1 below. But it also has been traditionally a *safety net* (an insurance policy so-to-speak) when they experience hard time, such as rice shortages, inadequate cash income, etc. As illustrated all nine villages (to a greater or lesser extent) rely on nature for meat, fish and vegetables. This usually depends on the amount of forest land in or nearby their villages.

Table II.1: Reliance on Forest & Farm for Food

	Toumlan						Khoun						Vieng Phou Khaa					
	Non Savang		Done Bounq		Din Daak		Kosii		Dong Dan		Dong Mai		Nam Faa		Nam Ngeun		Nam Singh	
	forest	farm	forest	farm	forest	farm	forest	farm	forest	farm	forest	farm	forest	farm	forest	farm	forest	farm
meat	80%	20%	70%	30%	90%	10%	80%	20%	70%	30%	30%	70%	60%	40%	60%	40%	30%	70%
fish	80%	20%	90%	10%	30%	70%	33%	66%	30%	70%	20%	80%	20%	80%	30%	70%	30%	70%
vegs	70%	30%	90%	10%	80%	20%	33%	66%	10%	90%	50%	50%	60%	40%	70%	30%	80%	20%

These so-called hunting and gathering activities very much influence the time allocations of households. Responsibilities for these activities vary according to gender, age cohort and by season. For example, since chicken rearing is mostly women's work then any drastic expansion will have to examine whether this will compete or mesh with their hunting and gathering and other household activities.

B. Rice as an Element of Livelihood/Farming System

As we all know, in Lao PDR, as well as for most of Asia, one hasn't really eaten a meal unless is rice included. In all of the nine sample villages rice sufficiency was indeed the most important aspect of their agricultural livelihood systems. Thus, we will briefly examine this self-sufficiency in all of the nine investigated villages.

Clearly all villages considered themselves as rice-based farming/livelihoods systems. In only three of the nine villages were there households with no paddy land (cf Table 3.4 below). However, in all villages there was still inadequate paddy land for many of the households and most who did have paddy land still lacked irrigation water. All nine villages were limited as to potential land which could be opened as paddy land¹⁷. So hopes for households without paddy land are not bright for most villages¹⁸. Also, there does not seem to be much other agricultural land available in these villages due to land allocation.

Table II.2: Village Households with Paddy Land

	Total										
		Land		Land	Area [ha]		low	avg	high	Expansion	
		HHs	HHs	area	HHs	low	high	yield	yield	yield	
Toumlan											
Non Savang	33	29	62.9	4	?	?	1.5	2.7	3	10	8 HHs >1 ha
Done Bounq	39	39	187.1	0	?	?	1	2	2.6	4	

¹⁷It is highly unlikely that B Non Savang has this much potential paddy land available.

¹⁸Additionally, B Nam Ngeun in VPK still is awaiting for the lignite coal mining company to provide 12 hectares of paddy land for that confiscated in 1994.

	Total HHs	Land		Land HHs	Area [ha]		low	avg	high	Expansion ha	
		HHs	area		low	high	yield	yield	yield		
Din Dak	63	59	80.0	4	?	?	1	1.5	2	80	unlikely
Khoun											
B Kosii	100	52	58.9	11	0.3	8.9	1.5	2	2.7	0	
B Dong Dan	71	58	32	13	1.15	9.1	2		9	2	
B Dong Mai	35	35	22	0	0.69	3	3.5		4	4	
Vieng Phou Khaa											
Nam Faa	109	109	111	0	0.3	3	2.7	4.5	4.5	0	
Nam Ngeun	81	76	43	29	0.2	2.5	2.5		3.5	0	
Nam Singh	63	52	28	9	0.2	>1	2	2.5	2.5	10	

All the villages investigated consider rice self-sufficiency as their primary concern or what we commonly refer to as *food first*. As can be seen in Table II.3 below only three villages attained this self-sufficiency with B Nam Faa in Vieng Phou Khaa amassing an amazing calculated two year surplus. The six villages with rice deficits had to earn cash income enough to purchase required rice. The amount of income required ranged from Kip 2.5m to Kip 152.5m.

Table II.3: Village Rice Self Sufficiency

	Total HHs	Reported Rice					Estimated Rice Sufficiency 2008								Value Rice [Kip m]
		Sufficient [mos]					2007	Rice	WS07	uplan	DS07	Total	Rice	Rice	
		<3	3-5	6-8	9-12	>12	Total	Req	Padd	07	Padd	Rice	S(D)	S/(D)	
village	HHs						Popl	[t]	[t]	[t]	[t]	[t]	[t]	[mos]	
TLN															
Non Savana	33			29	4		275	96.3	32			32	(64.3)	(8.0)	(160.6)
Done Bouna	39			55	23		409	143.2	168			168	24.8	2.1	62.1
Din Dak	63	4		55	4		517	181.0	120			120	(61.0)	(4.0)	(152.4)
KHN															
Kosii	100		11	35	27	8	593	207.55	147	32	0	179	(28.6)	(1.7)	(71.5)
Dong Dan	71	16		52		3	514	179.9	120			120	(59.9)	(4.0)	(148.8)
Dok Mai	35			7	16	12	271	94.85	88			88	(6.8)	(0.9)	(17.1)
VPK															
Nam Faa	109			3	98	8	618	216.3	499.5	0	161.2	661	444.4	24.7	799.9
Nam Ngeun	81			9	50	22	434	151.9	150.5	0	0	151	(1.4)	(0.1)	(2.5)
Nam Singh	63	10		20	26	7	320	112	130	20	0	150	38.0	4.1	68.4

Food security (ie, rice deficits) is assured by most households, except the poor, are compensated by cash income earned from other portions of their livelihoods systems. Of course, there are always some households, who have surplus rice and others who are hard pressed for cash who have to sell rice and to experience even further rice deficit. Clearly Toumlan villages do not have enough rice surplus to sell for cash income as does B Nam Faa in VPK

The main problem for the village rice production is self-sufficiency. If the village has rice, it's not poor.

C. Livelihoods System Sources of Cash Income

In lieu of detailed data and information on the livelihood/farming systems this information on the village sources of cash income and partial data (only from Vieng Phou Khaa) showing household sources of cash income.

Upon examination of the aggregate data for the nine villages on average, large livestock provided about one-third of annual cash income; poultry (mostly chickens) provided about 13.5 percent cash income; rice about 14.5 percent; handicrafts about 24.7 percent; off-farm and in town employment about 19 percent; and NTFPs about 9.7 percent.

Of course, upon examining the three districts closer some things are revealed about the different districts with their respective agroecosystems and opportunities.

In Toumlan large livestock (15.1%) and pigs (18.4%) are all important sources of cash income (except for poultry [2.9%]), and off-farm cash income (27.8%) and in town cash income (26.6%) are more important than in other districts. Since this district is more isolated, it's easier to sell livestock since they are more mobile. Each day in the dry season (DS) traders come from Saravan town to buy chickens.¹⁹ Additionally, off-farm and in-town employment are an important factor in their livelihood/farming systems.

Table II.4: Village Livelihoods Systems Sources of Income [average in Kip m]

																	Total
													handi				Village
District	cattle	buffalo	pigs	poultry	eggs	fish	fruit	rice	corn	cassava	other	NTFPs	crafts	off-farm	in town		Income
TLN		15.0	18.3	2.3		4.0	2.5					2.5		27.6	26.2		98.4
		0.0%	0.0%	0.0%		0.0%	0.0%					0.0%		0.0%	0.0%		0.0%
KHN	70.5		6.1	23.5			4.3					76.5	176.8	41.0	19.8		418.4
	0.0%		0.0%	0.0%			0.0%					0.0%	0.0%	0.0%	0.0%		0.0%
VPK	30.0	143.3	57.7	88.1	2.2	3.0	50.0	120.6	75.1	20.0	1.0	3.5		6.3	2.0		602.7
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%		0.0%
Avg	38.5	53.9	22.0	37.2	2.1	1.8	18.1	40.2	25.0	6.7	1.2	26.7	68.1	24.5	40.1		340.4
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		

Similarly in M Khoun cash income are more important than elsewhere, mostly from: handicrafts (42.3%) and NTFPs (18.3%) sales. This very has to do with the handicraft skills of the Hmong (embroidery) and the Tai Phuan (cotton and silk weaving) and their subsequent market opportunities. Large animals are also important (16.9%) as well as off-farm and in-town employment (14.5%). The agroecosystems in Xieng Khouang are appropriate for large animals and markets are good.

Whereas, in Vieng Phou Khaa cash income was important with: large animals (28.5%), rice (19.8%), other crops (15%), poultry (14.5%), etc. Obviously, the fact that these villages are located on the newly constructed NR3 extending from the China border to B Huay Xai (Bokeo) on the Mekong, helps to get their products to markets. B Nam Ngeun has the greatest opportunity for off-farm employment with the lignite mine, but they receive a low salary and only ten village persons are employed out of a total of 400 employees of the lignite mine.

Unfortunately we have household data on the various household sources of income only for

¹⁹Our team saw a local man riding a bicycle loaded with chickens on his way to Saravan town.

the Vieng Phou Khaa villages. Upon examination of this sample data of six households for each village (cf Table II.5 below). On average of the households in the three villages oranges provided the greatest portion (50.3%) of cash income, followed by including rice (13.0%), chicken (5.5%), and others.

Table II.5: Sources of Household Cash Income in Vieng Phou Khaa Households [Kip m]

															Village
village	cattle	buffalo	pigs	poultry	eggs	fish	fruit	rice	corn	cassava	other	NTFPs	off-farm	in town	Income
Nam Faa		300.0	150.0	250.0	2.2	9.0		226.8	60.0	20.0		2.5			1,020.5
		0.0%	0.0%	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%		0.0%			
Nam Ngeun	30.0	100.0	12.0	13.0			50.0					5.0		2.0	182.0
	0.0%	0.0%	0.0%	0.0%			0.0%					0.0%		0.0%	
Nam Singh		30.0	11.2	1.4				14.4	90.2		1.0	3.1	6.3		157.5
		0.0%	0.0%	0.0%				0.0%	0.0%		0.0%	0.0%			
Avg	30.0	143.3	57.7	88.1	2.2	9.0	50.0	120.6	75.1	20.0	1.0	3.5	6.3	2.0	453.3
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

However, if we examine individual villages, there is considerable variation. Obviously, B Nam Faa has the majority of cash income from the sale of rice (68.9%), and chickens provide the second major source (12.8%). In B Nam Ngeun orange sales (78.1%) is most important and chickens are quite slight (2.3%). And in B Nam Singh corn sales (35.5%) are the greatest income earner and chickens are 9.5 percent, the greatest of any of the three VPK villages.

Appendix III: Terms of Reference [TOR]

LEA Activities Impact Study (LAIS)

Objective:

To produce a summary of the impact of the Lao Extension Approach (LEA) on the production and incomes of farmers who have been trained in selected sites.

Audience:

Senior MAF officials, Provincial heads, donors and project managers, all of who need to be convinced that continued and expanded support for the LEA is a worthwhile investment.

Tasks:

1. Compile and analyse secondary data for the selected sites:

1.1 Re-examine data compiled for the External Evaluation

1.2 Compile and examine other available data, particularly any that has been generated or collected since the evaluation.

2. Undertake field visits to each site:

2.1 Agree on workplan for field visits and framework for cases with LEAP management

2.2 Undertake field visits to three sites in different parts of the country

3. Prepare and present an assessment of LEA impacts

3.1 Prepare data summary in the form of tables and graphs.

3.2 Prepare a set of short (1-2 page) cases of selected villages and/or households, with both quantitative and qualitative information

3.3 Present the findings to a meeting of key stakeholders to be organised by LEAP.

4. Make recommendations regarding future data collection and analysis

4.1 Briefly describe what data is being collected by farmers and extension workers in the context of the LEA, and what type of analysis they are already carrying out.

4.2 Make suggestions about how field level data collection and analysis could be improved, as part of the learning process.

4.3 Make suggestions on how field level impact data might feed into a broader M&E system for NAFES.

Issues to address:

We are looking to make conclusions about ranges and averages for the impact of LEA extension activities on

\$ production

\$ food availability

\$ incomes and

\$ gross margins

Data is incomplete, but where possible we should make separate analysis by commodity (rice, pigs, chicken) of geographical area (upland provinces, southern provinces) or other types of generalisation that are supported by the data with a reasonable degree of confidence.

Selected sites:

The following Districts have been identified as exemplary sites and should be the focus of all data collection, field visits and cases studies carried out as part of this study:

- Toumlane (Salavane)
- Khoun (Xieng Khuang)
- Viengpuouka (Luang Namta)

These sites represent a range of conditions (social, geographical, agricultural) in addition to different stages of the LEA introduction.

Presentation of findings:

The output of this assessment should be as short and as simple as possible.

The consultant should produce a PowerPoint or Keynote presentation with no more than 25 slides, with a supporting handout of no more than 12 pages.

The outputs should be as visual as possible. Graphs, tables, maps, and bulleted lists rather than blocks of explanatory text.

Time frame:

i) Reading and analysis of available data = 1 week

ii) Preparation and field visits for case studies = 3 weeks

iii) Discussion of findings and preparation of outputs = 1 week

Total 4 weeks + a day or two for a presentation and finalisation

Team:

One international expert with background in economics, experience of managing extension projects in Laos, familiarity with both LEAP and the LEA and fluency in spoken and written Lao.

One Lao national act as research assistant.

Appendix IV: References

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