Pathways to improving livelihoods in the uplands of Laos: Researching and improving extension practice

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Abstract
This paper will take you on a journey to Laos to explore recent research into pathways for scaling out livelihood impacts from forage and livestock technologies. Laos is a country in transition where upland farmers are facing challenges to maintain food security in the face of declining rice yields and government policies to reduce shifting cultivation. At the same time, opportunities are emerging for households to increase cash income from livestock production, cash crops, non-timber forest products and non-farm activities. A participatory research and extension project funded by AusAid identified and introduced suitable forages for livestock in two northern provinces of Laos. As production and livelihood benefits from using forages started to emerge, it became important to capture these impacts and use them as an extension tool for scaling out forages to more villages.

Different extension methods for scaling out to new villages were trialled, including case studies, cross visits (farmers visiting a village with impacts), and champion farmer visits. Cross visits were more effective in creating informed awareness and confidence in using forages than case study presentations or champion farmer visits. Cross visits were also the preferred learning method for most of the farmers interviewed as they are able to see the technology being used and interact with the host farmers. However cross visits require greater time commitment and cost for the benefit of fewer farmers. As a result of this research, a mixed method approach is now used. The key learnings from this research are that choice of pathways and extension methods for scaling out technologies can be critical to farmer learning and potential long term livelihood benefits. On the job learning using an action research approach creates understanding of farmer learning and how different factors influence farmer willingness and capacity to use technologies. Farmers, government staff, NGOs and the private sector all need to be involved in finding pathways and exploring possibilities for future scaling out of livestock production in Lao PDR.

Keywords
Rural livelihoods, scaling out impacts, participatory extension, shifting cultivation, livestock production

Introduction
Poverty alleviation among rural households and villages in upland areas of Southeast Asia remains a major challenge due to their remoteness and reliance on shifting cultivation farming systems. This is particularly so in Laos, a landlocked mountainous country undergoing rapid population growth since the Vietnam War. More than 85% of the population live in rural households and about 40% are fully or partially involved in shifting cultivation mostly in the mountainous northern regions (Hansen 1998). Many upland farmers are from ethnic minorities living in remote areas, are often very poor, and face hardships whilst they continue traditional farming practices. Poverty in upland areas has increased due to the interventions of war, resettlement, post-war population increases, natural disasters and poor implementation of land allocation policies (ADB 2001). This has led to shortened crop rotations, lower rice crop yields, weeds, pests, increased labour requirements, livestock diseases, loss of forest and wildlife resources and land degradation in some areas (Roder 2001). Hence, upland farmers are looking for alternatives to reduce their reliance on shifting cultivation systems and increase cash income whilst maintaining food security and minimising risk. They are looking for pathways to improve their livelihoods.

Householders traditionally rely on a few large or small livestock (eg cattle, buffalo, goats, pigs, poultry, fish) for cash income and as a safety net in times of need such as health, education, weddings, building a new house etc. As an alternative to shifting cultivation, increasing livestock production can play an important role in providing increased cash flow and reducing labour requirements (Stür, Gray, & Bastin 2002). In 1995, the Australian government (via AusAid) funded a program of developing suitable forage varieties for livestock production in Southeast Asia with CIAT (International Centre for Tropical Agriculture).
The Forage and Livestock Systems Project (FLSP) then worked with Lao government research and extension staff to test selected forages and animal health practices with farmers in upland provinces of Laos. Participatory research and extension methods were used to build the capacity of national, provincial and district staff to work effectively with farmers in five districts across two northern provinces (Horne and Stür 2003). Villages identified their major livestock problems and farmers self selected to trial and integrate forages into their systems, whilst learning about livestock feeding, health, production and management. Within two years, farming households began to demonstrate significant impacts on their lives from labour savings, increased livestock productivity, more security from having livestock close to home, available income to buy rice and other goods, and children able to go to school instead of tending to animals in the forest or grasslands. They were starting to find pathways to practice change that delivered real benefits to livestock production and livelihoods.

However, the number of households with significant impacts was relatively small and localized both within and between villages. The challenge was to move beyond simply trialling these technologies with individual farmers on a small scale to enabling impacts across larger numbers of households, villages and districts (Fujisaka 1999; Connell 2000, Millar et al. 2003). This process is commonly referred to as ‘scaling out’ and can be defined as;

‘the process of working with farmers to enable beneficial technologies to be adapted across a wide range of people and farming systems to improve their livelihoods.’ (Millar et al. 2005)

In 2003, the Australian Centre for International Agricultural Research (ACIAR) provided funds to Charles Sturt University, the Lao National Agriculture and Forestry Extension Service (NAFES) and CIAT Asia to research the process of scaling out forage and livestock technologies being carried out by the FLSP. It was determined that scaling out could occur using three pathways;

1. Introduce the proven technologies and their potential impacts to new villages.
2. Encourage and enable more farmers within existing FLSP villages to take advantage of the technologies being used by other farmers, adapt them to their own farming systems and benefit from the impacts.
3. Introduce the technology to other development projects.

However before embarking on any of these pathways, the FLSP had to be able to clearly demonstrate that production and livelihood impacts were real, achievable and substantial (Connell et al. 2004). Extension staff began conducting cross visits (where farmers are taken to another village) as a way of enabling new farmers to see and discuss forage and livestock production with more experienced farmers. As more cases of impacts started to emerge and the number of experienced or ‘champion’ farmers grew, district extension staff started to develop case studies of successful farmers with support from provincial and national research and extension staff. The case studies served as an extension tool and to demonstrate what was happening to extension managers and funders.

In 2004, the FLSP decided to double the number of upland villages from 51 to 104 so the provincial and district extension teams had to decide how they were going to introduce potential impacts to 53 new villages in an effective and efficient way (ie scaling out method 1 above). This created an opportunity to trial three extension methods (case studies, cross visits and champion farmer visits) to see how effective they were as a tool for scaling out forages. The aim was to introduce new farmers to livestock systems not just forages, to accelerate the extension process and get groups up and running early on so farmers could support one another.

This paper describes how the extension methods were applied, how the research was carried out, the effectiveness of each method for scaling out forages and additional pathways to scaling out now being explored. Conclusions are drawn on the role of extension research and practice in providing pathways out of poverty for upland farmers in southeast Asia.

**Methods**

Action research methodology was used to maximize involvement of Lao government staff and build their capacity to facilitate the scaling out and adaptation of beneficial technologies. Action research differs from
traditional social research in that research is conducted with the people responsible for implementing the outcomes of the research. Instead of outside ‘experts’ designing and doing the research, those working directly with local people or local communities themselves are involved in the research process. The process is valued as much as the product and success relies on developing skills of participants through an iterative cycle of action and reflection (Kindon 2005). As Russell and Harshbarger (2003, p.235) explain,

‘Sharing thoughts, discussing research questions, asking questions, sparking the imagination and intellect, collaborating, building partnerships, taking action and getting the desired results is what action research is all about.’

The research was carried out with staff from the provincial and district agriculture and forestry offices in Luang Prabang and Xieng Khouang provinces over a period from February 2004 to February 2005. It involved several stages including;

1. Planning and implementation of extension methods (February to June 2004)
2. Selection of villages and farmers for interviews (August 2004)
3. Farmer interviews (September 2004)
4. District staff interviews (October 2004)
5. Staff reflection workshops (October 2004 and February 2005)

Nine case studies were developed by staff including two of pig raising systems, two on buffalo fattening, two on cattle feeding and management, and three on goat raising systems. Each district team were given the same set of case studies which they presented to 38 new villages as photos with verbal explanation of what the farmers in each case study were doing to improve livestock production. In the process of presenting case studies, it became evident that farmers were not getting enough information from the photos and explanations alone so system sketches were included to illustrate the steps taken by case study farmers. This method stimulated more discussion and understanding amongst farmers in the new villages, and was continued for the rest of the villages. Staff reflected in between village visits on what had worked and not worked in their case study presentations. These reflections enabled them to improve on their case study presentations as they moved from village to village (known as ‘Ban’ in Lao language). Using system sketches worked particularly well in Xieng Khouang province where district staff work with Hmong farmers who have less understanding of the Lao language, especially in the case of women who generally speak Hmong only.

Cross visits were organized by extension staff for eight villages in Luang Prabang province (timing did not suit Xieng Khouang villages who were busy preparing upland fields for planting crops). The selection of host villages was aimed at closely matching existing or potential farming systems with new villages. About five representatives (women and men) were selected to attend the cross visits. They then gave a feedback session to the rest of their village on the next day. Champion farmer visits were held in seven villages according to relevant livestock systems and proximity of villages due to the difficulty of travel in Laos.

Nine villages (15% of total 53 villages involved) were randomly selected for farmer interviews, comprising three villages for each extension method across different districts (six villages in Luang Prabang province and three villages in Xieng Khouang province). For each village, district staff and the village headman or group leader were asked to select three farmers who had planted forages that year (active) and three farmers who had not planted forages (non-active). All farmers were to have been present at the case study meeting, cross visit or village feedback, or champion farmer visit meeting. Table 1 shows the number of villages and farmers selected.

Table 1  Number of villages and farmers selected for interviews

<table>
<thead>
<tr>
<th></th>
<th>No of villages</th>
<th>Active farmers</th>
<th>Non active farmers</th>
<th>Total farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Studies</td>
<td>3</td>
<td>9</td>
<td>8*</td>
<td>17</td>
</tr>
<tr>
<td>Cross visit</td>
<td>3</td>
<td>9</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Champion farmer visit</td>
<td>3</td>
<td>9</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>27</td>
<td>26</td>
<td>53</td>
</tr>
</tbody>
</table>

* Note one non-active farmer did not turn up on the day.
Semi-structured interviews with individual farmers were carried out to explore how effective each method had been in terms of the progressive stages of farmer learning and technology adaptation (awareness, trialling, observations, impacts, integration, plans). The possible indicators explored were:

- creating awareness of potential benefits and impacts from using forages;
- how many farmers were trialing forages and which system they adopted;
- what benefits or problems they were already experiencing;
- their plans for future use or expansion;
- what they thought of each extension method as a learning tool, and;
- their preferences for learning.

Semi-structured interviews were conducted with individual district staff in October 2004 after completion of the farmer interviews. Fourteen district staff were interviewed from Luang Prabang province only. Time did not permit interviews with Xieng Khouang staff, however these staff were involved in workshops in October 2004 and February 2005 where the effectiveness of each extension method was discussed.

Results
The results showed that the extension methods had an influence on the following aspects of farmer learning and technology adaptation;

1. Farmer awareness of potential impacts
2. Farmer confidence in trialing the forages and adapting livestock systems
3. Farmer preference for learning

There was no effect on the number of active farmers, forage area planted, type of livestock systems used, farmer observations, impacts from using the technologies, reasons for not using forages or plans for the future. Variations in these measures related largely to village and individual farmer characteristics (e.g. availability of land for livestock, existing livestock systems, farmer preferences).

1. Farmer awareness about forages and potential impacts

The level of farmer awareness about potential impacts from using forages was determined from individual responses to questioning about what they learnt at the case study meeting, cross visit, or meeting with champion farmer. Responses were analysed and given an overall rating of 1 to 5 (1=no awareness, 2=some awareness, 3=aware, 4=very aware, 5=strongly aware). Awareness amongst cross visit farmers ranged from 1 to 5, case study farmers ranged from 1 to 4 and champion farmer visit farmers ranged from 1 to 3. Scores were then averaged for each method as shown in Figure 1.

![Figure 1: Average level of farmer awareness of potential impacts (N=53)](image)

These results show a higher level of awareness amongst those farmers who attended the cross visit and village feedback sessions. Farmers who attended the cross visit were able to describe what they had seen (e.g. forages grown, livestock systems), what the host farmers had told them (benefits and impacts) and how to establish and use the forages. Importantly, they were also clear about what they did not like and how they would do things differently.
For example, an active farmer from Ban Sip Et, in Xieng Ngeun district was very clear about the impacts he had seen on a cross visit including:

- having lots of feed for livestock
- reduction in labour required to collect local feed
- increase in pig liveweight of 15kg/month.

There was less difference in the level of awareness amongst farmers who had attended case study meetings and champion farmer visits. The lower level of awareness from using these methods can be attributed to lack of opportunity to see how forages were being used or time to ask pertinent questions and too many people at the meetings. As one case study meeting attendee said,

“The photos were small, only those sitting closer could see. There were not enough words on the posters to understand and explain new methods. There were too many people at the meeting, so it was too noisy.”

Amongst non-active farmers there was a slightly higher level of awareness for those who had attended a champion farmer meeting than those attending case study presentations, whereas for active farmers the level of awareness was similar for both methods. Many factors can contribute to awareness level particularly when interviewing 2-3 months after the event. The active farmers had the advantage of already growing and using forages and seeing the immediate benefits. Some non active farmers were observing active farmers and wanting to wait and see before committing themselves. Despite these confounding factors, most farmers were able to describe what they learnt from the meetings, whether case study presentations or a champion farmer talking, and explain why they decided to try or not try forages.

2. Farmer confidence in trialing the forages and adapting livestock systems

In the process of scaling out proven technologies, possible indicators of success are whether farmers are clear on how to integrate the technology into their farming system and whether they are able to overcome technical problems as they arise, rather than relying on outside expertise. Innovation with the technology may also be an indicator. During the interviews it became evident that there was a higher incidence of technical errors and lower ability to solve problems amongst farmers who attended the case study meetings compared with farmers who attended cross visits. One farmer was feeding the wrong ratio of stylo (legume) and rice bran to his pigs; another farmer was not cutting stylo before mixing with rice bran and a couple of farmers had not cut their forages because they were waiting for the extension officer to tell them when to cut. This also occurred with one farmer who had attended a champion farmer talk.

Reasons for this can be explained from comments made by some farmers who attended case study meetings who indicated that there was not much time spent discussing technical issues (eg how to plant and use forages, potential problems etc). Farmers indicated that the presence of champion farmers at cross visits allowed more in-depth discussion and demonstration of the technical aspects of forage and livestock production. This was supported by interviews with some district staff who found that less assistance was needed by farmers who attended the cross visit or champion farmer visit, compared with case study villages.

3. Farmer preference for learning

Towards the end of each interview, farmers were asked which extension method they preferred for learning about new technologies. The results are shown in Figure 2 for all farmers interviewed. [Note: no-one nominated case studies as a preferred method. DAFO refers to extension officers]. There was a strong preference for cross visits as a method for learning about new technologies, even amongst farmers who have never been on a cross visit. Reasons given related to being able to see a range of forage plots and livestock management and talk to host farmers. The following quotes from farmers illustrate these points.

“I need to look at impacts in another village first, then I might plant. I need to know the planting system, cutting method and explanation of how to fatten animals.”

If a champion farmer comes to visit then it’s difficult for me to remember what he/she has said. However if I go on a cross visit and see for myself then I am more likely to remember.”
Several farmers suggested that they would prefer to go on cross visits with a small group from their own village rather than several groups from other villages to allow more discussion as they felt there were too many people at each location. Interestingly, active farmers were twice as likely to mention cross visits as their preferred method than non-active farmers. This may indicate different learning styles between active and non-active farmers. Champion farmer visits were the next most popular extension method. Those farmers who preferred a champion farmer to visit their village, gave reasons such as:

- Lack of time (women)
- Too far to travel (eg remote village, older farmers)
- Concerns about leaving children and house security (women)
- More chance of being able to discuss things one to one and in detail (eg step by step). High credibility of champion farmer

As one farmer from Ban Phontong expressed, “I believe Mr Lao Lee because he is a farmer and has done these things by himself.” Some farmers expressed the desire to hear from champion farmers in their own village in preference to other villages. For example, another farmer from Ban Phontong said he would not like champion farmers from a distant village because the climate is different. He prefers to hear about local successes, and for champion farmers to explain how to do things better, such as getting better yields.

Many farmers thought that case studies alone did not provide enough information, and some did not fully understand what was being presented. Those farmers who had attended case study meetings were more likely to want technical information and more follow up advice on what to do (eg extension officer visit, books, video, demonstrations). Nine farmers said they would prefer to work with district staff on a one to one basis.

*An A multiple method approach*

Some farmers offered suggestions for using multiple methods, indicating they did not see the methods as mutually exclusive. This was confirmed by extension staff in individual interviews and at a mid season workshop where they identified the strengths and weaknesses of each method (Millar et al. 2005). For example, conducting cross visits relies on having appropriate impacts to demonstrate, selecting the right farmers, having resources to fund the visit and accessible villages (difficult in Lao due to remoteness). On the other hand, if cross visits require less follow up from extension staff they might be a worthwhile short term investment where access is difficult and regular visits from staff are not as frequent.

After some discussion there was general agreement that all three extension methods can be used at different stages to introduce impacts to new villages, and this may vary from village to village. In developing their extension plans for the following year, staff also recognised that many factors other than extension methods influence farmer willingness and capacity to engage in and benefit from a new technology. Some of the factors raised by staff which also became evident when interviewing farmers in this study were;

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• Farming system (eg land, income, main enterprises, problems)
• Farmer need or capacity to use forages (eg as a livestock supplement or full diet)
• Livelihood constraints (eg age, labour, health, wealth, education)
• Market influences
• Level and quality of technical information, inputs and ongoing support
• Way information is delivered by extension officers or champion farmers
• Information pathways (eg through kinship or friends or radio)
• Village leadership

Conclusion
The aim of this research was to explore possible pathways to scaling out livestock production technologies in Laos using different extension methods and an action research approach with government staff. The process of trialling extension methods with villages, reflecting on farmer responses and actions, conducting interviews and participating in workshops enabled staff to improve their extension planning and practice.

Lao Government rural policies and programs aim to work with farmers as partners using participatory approaches to alleviate poverty (NAFES, 2005). Moving from participatory research with individual farmers to scaling out requires that researchers and extensionists develop new knowledge and skills to work with groups of farmers, understand whole farm and livelihood systems, and build networks within and between communities (Millar & Curtis, 1997; Connell, 2000; Harrington et al. 2001; Snapp and Heong 2003). Staff training and on the job learning should result in an understanding of the stages of farmer learning and how different factors including the use of extension methods can influence farmer willingness and capacity to use technologies.

Although the aim of scaling out technologies is to reach as many potential beneficiaries as possible in the shortest time (ie to accelerate impacts), the choice of methods for scaling out can be critical to the farmer learning process and potential long term benefits. Involving farmers in selecting their preferred learning methods and evaluating their progress will ensure the right mix of extension methods is used for scaling out. For example, in 2005 farmers who have embarked on intensive livestock production requested visits to adjoining provinces where other farmers were developing marketing strategies with traders and government. These study tours have stimulated farmers in a district to coordinate the production and marketing of their livestock. Other pathways to scaling out being explored in 2006 include field days within clusters of villages, mentoring extension staff from other districts, distributing forages to other projects, and continued sale of forage cuttings by farmers.

Several authors also emphasise the importance of identifying key actors who play positive influential roles in spreading innovations as well as the institutional structures and reward systems that give rise to positive outcomes whether from the private, public or NGO sector (Biggs 2003; Pachio and Fujisaka 2004). These aspects of capacity building and organizational partnerships will be researched in the coming years as important elements in providing the pathways and possibilities to further scaling out of livestock production in Laos.

Three key learnings from this research are

• Choice of pathways and extension methods for scaling out proven technologies can be critical to farmer learning and potential long term livelihood benefits.
• Staff training and on the job learning using an action research approach creates understanding of the stages of farmer learning and how different factors influence farmer willingness and capacity to use technologies.
• Farmers, government staff, NGOs and the private sector all need to be involved in finding pathways and exploring possibilities for future scaling out of livestock production in Lao PDR.
References


