

How is improved agriculture and forestry education instrumental for supporting family farming in the Lao PDR?

Dominique Guenat¹

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¹ Agricultural economist PhD, head of the group for international agriculture at the School of Agricultural, Forest and Food Sciences of the Bern University of Applied Sciences, Zollikofen, Switzerland

1 Introduction

For nearly 800'000 smallholder farmers in the Lao PDR, it is a considerable challenge to sustainably manage natural resources while ensuring the food security of the country's population and to generate sufficient income for their families. Nowadays, Lao agriculture is still characterized by low productivity and relies on very basic technologies. One important support in the process of modernizing Lao agriculture is education. This paper examines the main challenges faced by smallholder farmers in the Lao PDR. Based on this analysis, it looks at the skills required by young agronomists, livestock specialist and foresters to enable them to efficiently support smallholder farmers to improve their situation. Within the framework of a comprehensive reform process taking place in 5 agriculture and forestry colleges under the Ministry of Agriculture and Forestry (MAF), the curricula of these colleges are made fully skills-based and practice oriented. The graduates from these colleges should become key stakeholders of the modernization of Lao agriculture.

2 Characterization and needs of family farms in the Lao PDR

2.1 How many family farms are there in Laos?

According to the latest agriculture census (Lao Census of Agriculture 2010/11), there are over 782'800 farm households in Laos (+17% compared to the census 1998/99), which is 77% of the total number of households. This shows the critical importance of agriculture as the main employer in the country. The average land holding per household is reported as follows: 22% of the households own less than 1ha of land, 32% own between 1 and 2ha of land and 46% own 2ha and over. The average plot size is 0.9 ha. According to a recent publication (Concessions and Leases in the Lao PDR: Taking Stock of Land Investments, 2012)² as much as 1.1 million ha (5% of the total land area of the Lao PDR) is shared by over 2'600 land lease and concession agreements. A typical Lao family farm is illustrated in figure 1.



- Upland management, production of upland crops (cassava, maize, vegetables,...)
- Lowland management including irrigation, paddy production
- Aquaculture, fish production
- Fodder production and conservation
- Livestock (buffalo, cattle) rearing,
- Pig production
- Chicken and ducks raising
- Crop processing (e.g. cassava)
- Meat processing and drying
- Handicrafts making
- Marketing farm products
- Etc.

Figure 1 Farmer in Bolikhamxay: a vast diversity of skills is required from the family members to run the farm

Leaving aside the fact that concessions and land lease enterprises are also potential employers of graduates of the colleges, the focus of this paper will remain on the smallholder family farms who are a vast majority of farms in Laos.

2.2 Characteristics of family farms

Table 1 suggests a typology of Lao smallholder farmers. Some important characteristics of these farms such as their location, the importance of self-sufficiency for their food security, and their market integration are presented. In addition, their specific needs to reduce poverty and to improve their livelihood are shown.

² Authors : Oliver Schönweger, Andreas Heinemann, Michael Epprecht, Juliet Lu, Palikone Thalongsechanh, publication supported by Swiss Agency for Development and Cooperation (SDC) – Centre for Development and Environment (CDE) - Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

Table 1 Types of smallholder farmers in the Lao PDR, their characteristics and needs

	Type 1	Type 2	Type 3
Status of the smallholder farmers	Independent, often not organized	Independent, partly organized in groups of interests	Partly independent (contract farming)
Location	Usually remote or very remote	Less remote	Often less remote than type 1, but not always
Market access	Limited access to markets	Better access to markets than type 1	Access to markets, especially access to a buyer for specific commodities
Importance of self-sufficiency	Very high, main objective of the farmer	High, balance between importance of food and cash crops	High, balance between importance of food and contract crop
Market integration	Limited, sale of some surplus products	Important, production of some products specifically for the market	Important, production of at least one product under contract, makes up a large share of the cash revenue
Trend in the evolution of the farm types	Nowadays, type 1 represents the vast majority of small-holder family farms	Type 2 tends to increase, but remains far behind type 1	Type 3 is bound to specific commodities such as tobacco, maize, coffee, fruit, vegetables, etc.
External technical support	Limited, especially for remote areas	DAFO staff, public extension and research	DAFO staff as well as private investor for the specific crop
Specific needs for improved performances	Access to improved seeds and breeds, know-how and inputs, high value low volume products for market access, transparent market information, focus on food security	Access to know-how and inputs, cash crops and animal production for the nearby markets, transparent market information, food security remains an issue	Support for the contract crop is normally granted by the contracting firm, needs in support for other crops and animal production may be similar to types 1 and 2

Obviously, for each farm type in table 1, the needs in terms of support are not the same. The challenge for agricultural and forestry education, and for extension services is to develop the skills required to efficiently and effectively support these specific needs.

2.3 Challenges and potentials of family farms

Using the challenges faced by family farms in Laos as a starting point will allow to derive the skills and support required to improve their situation. In general terms, the main challenges include the low productivity of crops, the limited possibilities for irrigation (especially in the uplands), the increasing pressure on land resources (partly due to foreign investments for plantations, bio-fuel, mining, etc.), the slash and burn (banned but still widespread and critically important for the food security of many farm families), the difficult access to markets (especially in remote areas), the low education of many farmers (and particularly women and ethnic groups), the lack of modern technologies for agriculture, and the low competitiveness of Lao agriculture in general.

On the other hand, there are also potentials, such as the low population density (reduced pressure on land), the country's self-sufficiency in grains (even if there are large regional differences), the improving infrastructure (road access to markets), the competitive labour force, the growing demand for agricultural products with increasing urbanization, the country's economic growth (>7%/year since over 20 years), the improving education including in agriculture and forestry, and the ASEAN membership for improved access to regional markets.

3 Reform of the agricultural and forestry education in five colleges

In 2008, a comprehensive analysis of the agriculture and forestry education in 5 colleges (figure 2) under the Ministry of Agriculture and Forestry (MAF) conducted by a Task Force of MAF concluded that a major reform of the colleges was required. The analysis showed in particular that the education in those 5 colleges was not adequately in line with the labour market needs, did not sufficiently prepare the graduates for self-employment, for the elaboration of practical solutions to problems and constraints of Lao farmers, and for jobs related to agribusiness and marketing.

The reform process was launched in 2008 with the planning of a first phase of the SDC³ funded project SURAFCO⁴ that started in 2009, implemented by Helvetas Swiss Intercooperation. The first phase lasted until 2012, and its main focus was on the college of Luang Prabang (NAFC⁵). HAFL had the mandate to support the curriculum reform while SKAT⁶ was in charge of supporting the infrastructure development. A second phase of 4 years that started in 2013 aims at consolidating the results achieved in the first phase and to spread the reform to the remaining 4 colleges, based on the lessons learned in phase 1.

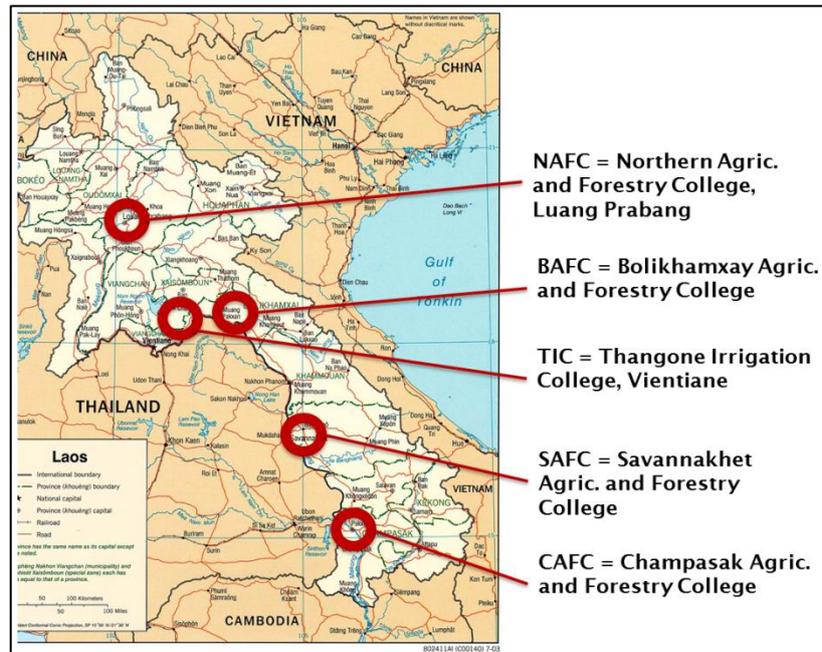


Figure 2 The five colleges under the Ministry of Agriculture and Forestry (MAF)

The present article explains the main changes induced by the reform process, shows the link between the colleges, their graduates and the labour market, and exposes the potential contribution of the reform to the development of family farming in the Lao PDR.

3.1 A participatory reform process

The reform was done in a stepwise participatory process involving the teachers, management and staff of the colleges. It started with the analysis of the labour market for graduates from the agriculture and forestry colleges, and the detailed analysis of the skills required in the main professions. Different types of skills⁷ were clustered and they were integrated in module⁸ descriptions, ensuring

³ SDC Swiss Agency for Development and Cooperation

⁴ Support to the Reform of the Northern Agriculture & Forestry College

⁵ NAFC = Northern Agriculture and Forestry College (Luang Prabang)

⁶ SKAT = Swiss Centre for Appropriate Technology, nowadays it is named "Swiss Resource Centre and Consultancies for Development"

⁷ We distinguished mainly between hard skills, referring mainly to technical skills (e.g. related to agriculture and forestry production or marketing), and soft skills that are related to methods and other skills (such as communication, teaching, extension, etc.)

that the revised curriculum would be truly “skills-based”. The main difference between a skills-based curriculum and a more traditional “knowledge based” curriculum is that the ability to realize activities in real time contexts is central. Knowledge alone is not sufficient, or even useless if the graduates cannot use it successfully! This means that the revised curriculum includes more applied theory and practice than pure theory. Each module description outlines what the students will be able to do (the skills) at the end of the module rather than the knowledge they would acquire.

Besides changes in the colleges’ curricula, the reform also offered trainings for teachers (upgrading the teachers’ technical and didactical capacities), addressed the issue of college management, and upgraded college infrastructures (in Luang Prabang only).

3.2 Changes in the philosophy

For the assessment of the modules in the revised curricula, a specific tool was developed (“spider diagram” for the assessment of modules, figure 3). This diagram includes five criteria that were considered of central importance in this project. Starting from the top of the diagram, the criteria and leading questions are the following:

- **Practice oriented:** is there a clear link to practical applications in the module?
- **Skills based:** do the module contents and methods clearly lead to achieving the skills that are described?
- **Gender and ethnicity:** does the module take into account these two factors, e.g. in the selection of contents, case studies, examples? Are women and ethnic groups not discriminated?
- **Sustainable development:** are the principles of sustainable development (ecological, economic and social) taken into account in the module?
- **Relevance for local agriculture and forestry systems:** are the module contents not too far from the local realities? Are the contents relevant for the farmers nearby?

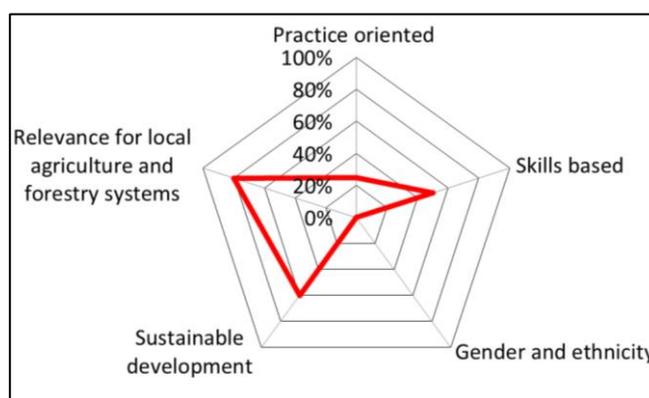


Figure 3 Spider diagram for the assessment of modules: For each criterion a scale from 0 to 100% shows how far the criterion is fulfilled. The red line shows an example of a module which is not sufficiently practice oriented, and that does not take into account gender and ethnicity aspects

A farming and forestry systems approach is another feature of the skills based curriculum. The graduates should understand the complexity of the farmers’ reality; they should be able to interpret the farmers’ decisions (e.g. regarding allocation of resources, risk taking, etc.) within the farming systems, and not just for a single branch of production. This can be integrated in the teaching process for example with case studies.

3.3 Changes in the teaching methods

The student centred teaching approach that was introduced with the SURAFCO project is very innovative in the Lao context. This approach implies at least partly a change in the role of teachers: a gradual shift from “pure” lecturer to teacher and coach. It also implies a different attitude of stu-

⁸ Modules are teaching units of different duration and scope. The modules are the building blocks of the curriculum. The total number of modules in the revised curricula is about 35 common modules (basic, core and minor specialised) and 9 major specialised modules, plus a few optional modules over three years.

dents, from consumers to active learners. A more active role of students should be observed in the classroom and in the field practice: working in groups (small or larger groups) is a form that is now integrated in many modules, as well as individual and group assignments. This interactive teaching that includes also many discussions enables students to build up and express their own position, to listen to other’s ideas and to consider issues from different points of view (empathy). This way, the students learn how to work in a team, how to find relevant information, etc. While doing that, they are not only constructing their knowledge but also developing their skills.

It is a major challenge for all the teachers to apply this new approach, as it differs considerably from what they have always been confronted with (at school, high school and university). For new teachers who have just completed their studies at one of the Lao PDR’s agricultural universities (Nabong, Souphanouvong, etc.) teaching at one of the MAF colleges, is even more a challenge. Acting as a coach requires more self-confidence and more communication skills than teaching from a book!

3.4 Changes in the contents

Compared to the former curriculum, a number of new topics were added (in response to the required professional skills as illustrated in figure 4), which obliged to revise and reduce or drop some topics that were in the former curriculum. Among the newly introduced topics, communication, management, marketing and business development are the main ones. The related modules are for example project management, report writing, community studies, rural development, rapid market appraisal, income generation, etc.

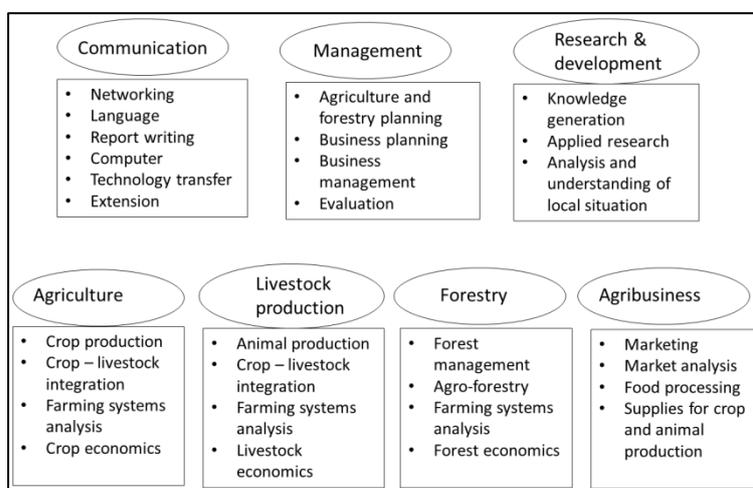


Figure 4 Clusters of the main skills required by professionals working in agriculture systems

The technical topics (crop production, livestock production, etc.) were partly rearranged and their contents were revised along the lines explained above.

3.5 Changes in the structure

The revised curriculum comprises basic subjects (9 credits), core subjects (37 credits), minor specialized subjects (22 credits), major specialized subjects (36 credits), elective subjects (3 credits) and the final term thesis (4 credits) for a total of 111 credits. Minor specialized subjects include the basic modules related to agriculture and forestry. These modules have to be taken by all the students. Major specialized subjects are more advanced modules that constitute the different specializations. After intensive debates about the majors, the decision was made to add one new major “agribusiness” besides the already existing “crop production” and “animal production”. In addition, the major “forestry” was also added to the four concerned colleges. In the Thangone Irrigation College, besides the existing major “irrigation engineer” a new major was introduced: “water resources engineer”. The major “agribusiness” was debated because the conclusion of the Task Force of MAF was that all the graduates should have enhanced skills for marketing, management and business (and not just a few specialists) as many of them are expected to become self-employed or partly self-employed. Therefore, the major “agribusiness” should not prevent other students from acquiring skills in mar-

keting, business and management. The compromise was that important basic skills (in the fields of Rapid Market Appraisal, income generation, farm management, business planning, etc.) should be included in the common part of the studies while the agribusiness major would contain more specialised skills as well as food processing.

Moreover, through the reform process, the colleges have obtained an upgrade of their diploma, from diploma to higher diploma.

3.6 Changes in networking with partners

The reform process also involves intensified networking with different categories of partners. The colleges have partners within the country (such as DAFO⁹ and PAFO¹⁰ extension services, research stations, projects, other colleges, universities, private companies, etc.) as well as abroad (universities in Thailand, Vietnam, China, and Switzerland, international research institutions, etc.).

The cooperation with these partners is important for the graduates (access to the labour market), for the students doing their field assignment (4-6 months in the field in the 6th term), for research activities, etc.).

Last but not least, local farmers should also become regular partners for different activities of the colleges (extension, participatory rural appraisal, on-farm trials, participatory technology development, etc.).

4 Where do graduates from the agriculture and forestry colleges find jobs?

Nowadays, the vast majority of the graduates from the colleges are employed in the public sector, either at the DAFO, PAFO or Ministry, in research stations, projects or schools. There is very little information about the graduates who did not get a job in the public sector, i.e. those who are working in the private sector, self-employed, individual farmers or those who are doing something unrelated to their studies. The fact is that the jobs in the private sector are still not really acknowledged or considered equivalent to jobs in the public sector in many people's minds. This should change if a growing number of graduates are to become self-employed or combine a part time job as advisors (under DAFO at the Kumban¹¹ level) and part time self-employed. The sectors where graduates from agriculture and forestry colleges find jobs are shown in figure 5.

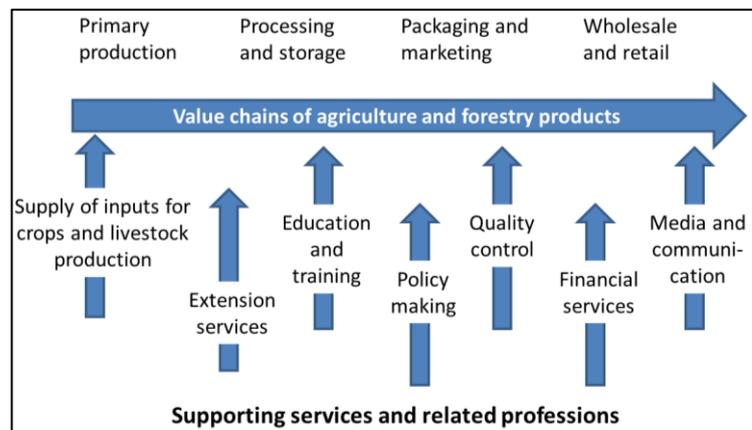


Figure 5 Sectors where graduates from agricultural and forestry colleges find jobs

5 How can the reform contribute to improve the situation of family farms?

In this chapter, the matching between what the students learn through the skills based curriculum and the farmers' needs will be discussed. We should however keep in mind that it is still too early to assess actual contributions, as the first batches of students who have gone through the revised cur-

⁹ District Agriculture and Forestry Office

¹⁰ Province Agriculture and Forestry Office

¹¹ Kumban = village cluster; kumbans are administrative units below the District

ricula (in Luang Prabang¹²) have just entered the labour market. Therefore, the items discussed below reflect more outcome and impact hypotheses (i.e. potential contributions) rather than effective, measurable outcomes. In general, we can state that the reform contributes to increase the knowledge about the farming systems, to foster innovation and to develop practicable solutions to constraints faced by smallholder farmers.

5.1 Learning more about farming systems of smallholder, family farms

As explained in earlier chapters, the skills based curricula should narrow the gap between what is taught in the colleges and the realities of the local farming systems. To ensure relevant module contents, the colleges need to gain additional knowledge about the local farming systems. One efficient way to achieve this is to assign students in their 6th term (practical term) with tasks such as:

- Socio-economic surveys on local farming systems focusing on:
 - Family farms, production and consumption
 - Livelihood, on-farm and off-farm income, poverty, etc.
 - Nutrition and self sufficiency
 - Socio-economics of ethnic groups, women
- Farming systems analyses (applying farming systems research approach (FSR)):
 - Crop production
 - Animal production
 - Agro-forestry
 - Access to services, finances and inputs
- Market surveys and analyses
 - Agro-processing
 - Analysis of value chains
 - Non-timber forest products (NTFP)
 - Market access
 - Product quality and conservation

With adequate coaching from their teachers, students in the 6th term have the necessary skills to conduct relevant studies and to gather a lot of information that can feed the teaching with relevant case studies.

5.2 Innovation, development of new technologies for smallholder farmers

The analysis of the farming systems helps identifying weaknesses or constraints family farms are facing. In many cases, new technologies are not readily available to respond to these constraints. This is where applied research activities can play a crucial role. During their studies, the students learn how to apply participatory methods such as on-farm trials (OFT), participatory technology development (PTD), rapid (participatory) market appraisals (PRA), etc. During their field assignment, they can apply these methods together with farm communities (or with focus groups of women or ethnic groups), and develop locally adapted solutions. Innovative solutions are needed in all the fields of family farms: food crop production (including new varieties, new crops), and storage, cash crops production (including new varieties, new crops) and marketing, livestock production (including health) for own consumption and for the market, agro-forestry, forest production and management, food processing, etc. This can also be done in cooperation with research institutions and projects.

¹² In the four other colleges, the implementation of the new curricula is planned to start in September 2014

5.3 Elaboration of material for extension, dissemination of new knowledge

All the results obtained in 5.1 and 5.2 need to be compiled, and made available to a larger number of farmers. This is something that students can do under the guidance of experienced teachers and partner institutions (such as extension services).

Testing newly developed technologies and disseminating them to a larger number of farm communities is another area where students can provide substantial contributions during their field assignment.

5.4 Graduates' contributions in their new jobs

With their practice oriented skills, the graduates will be able to substantially contribute to improving the situation of family farms in their new jobs, both in the public and private sector. Graduates will also be able to start their own small enterprises, some of them in their own villages, which is likely to serve as examples for other farm families, or they may even create new opportunities in the villages if they manage to develop new value chains for specific products. Farmers in the villages may then supply the raw materials for such value chains, under the guidance of the graduates.

6 Conclusion

It is a long way from improving the agriculture and forestry education to measurable improvements at the level of family farms. Moreover, attributing outcomes and impacts to improved education will remain a big challenge as many other factors are likely to improve or deteriorate the situation of family farms, such as the economic and political a context, the environmental factors, etc.

Nevertheless, the colleges have the opportunity to become centres of excellence in their fields, and thus to contribute to the overall development of the agriculture and forestry sectors along with other public and private institutions.

A few important points should be kept in mind to achieve this result:

- The reform of the colleges should be seen as a permanent process. The reform will not be “finished” at the end of the project. Modules need to be updated and improved in a continuous process, teaching methods also need to be revised and improved from year to year
- The reform is a slow process that requires the commitment of all involved stakeholders.
- The colleges need to acknowledge the importance of creating strong links with the farm community and partners
- The creation of new knowledge about the local farming and forestry systems must have a high priority on the agenda of the colleges, and the involvement of students in this process is a great opportunity
- Jobs in the private sector as well as self-employed graduates should be especially promoted, and be considered equally important and valid as jobs in the public sector
- Smallholder family farms as the largest group of stakeholders in rural development in the Lao PDR should be acknowledged as equal partners in the innovation process.