

## Enhancing land productivity while preserving natural resources in the mountains of Kham district

*Constrained by a hilly topography and long distances to the main economic centers of the province, agriculture in the northern part of Kham district has long been dominated by traditional slash-and-burn shifting cultivation. In general, the plots are cropped with glutinous rice during one year, sometimes planted with traditional maize varieties the following year, and left fallowed for 3 to 15 years depending on the distance of the plot to the village and the associated land pressure. In these forested environments, NTFPs are traditionally an important source of food. Over the recent years, many villages of the area have resettled, either spontaneously or under the guidance of the district authorities, along the national road no. 6 linking the district capital to Huaphan province. Soil fertility, however, is relatively low along the cultivated crest line and farmers have to walk long distances in order to find more productive plots (usually located near their former settlements). In some villages, 'upland roads' are thus being developed in order to make remote farmlands more accessible and facilitate transportation of commercial crops. Beyond these local investments in infrastructures, two main innovations have been developed and supported by the National Agro-Ecology Programme (PRONAE) to enhance the productivity of existing agricultural land.*

### Diffusion and constraints to adoption

#### *Improved pasture*

From 2004 to 2008, PRONAE has established on-farm demonstration plots in Suanmone village. Grass seeds and technical support were provided to farmers of Suanmone, Gnod Lieng, Keoleuk and Thaentho Thaenlot villages who volunteered to participate in the project. As a further incentive to pasture improvement, PRONAE proposed to buy the grass seeds that the farmer would harvest from their plots – an option which would allow farmers to cover their initial costs, especially for fencing. As a result, improved pastures have rapidly developed. In Keoleuk and Gnod Lieng villages, half of the population has established improved pastures over the past decade (Table 1). In Ban Suanmone, 25% of the villagers have done so.

In general, livestock-related activities appear to be well adapted to mountainous villages where suitable areas for cropping are limited. A number of issues have emerged however. The artificial market for grass seedlings established by PRONAE had a number of drawbacks. Some farmers have cultivated grass seeds as an annual crop without developing fattening activities. In Keoleuk village, some farmers are even protecting their grass plots from their own cattle. In Thaentho Thanlot, some farmers

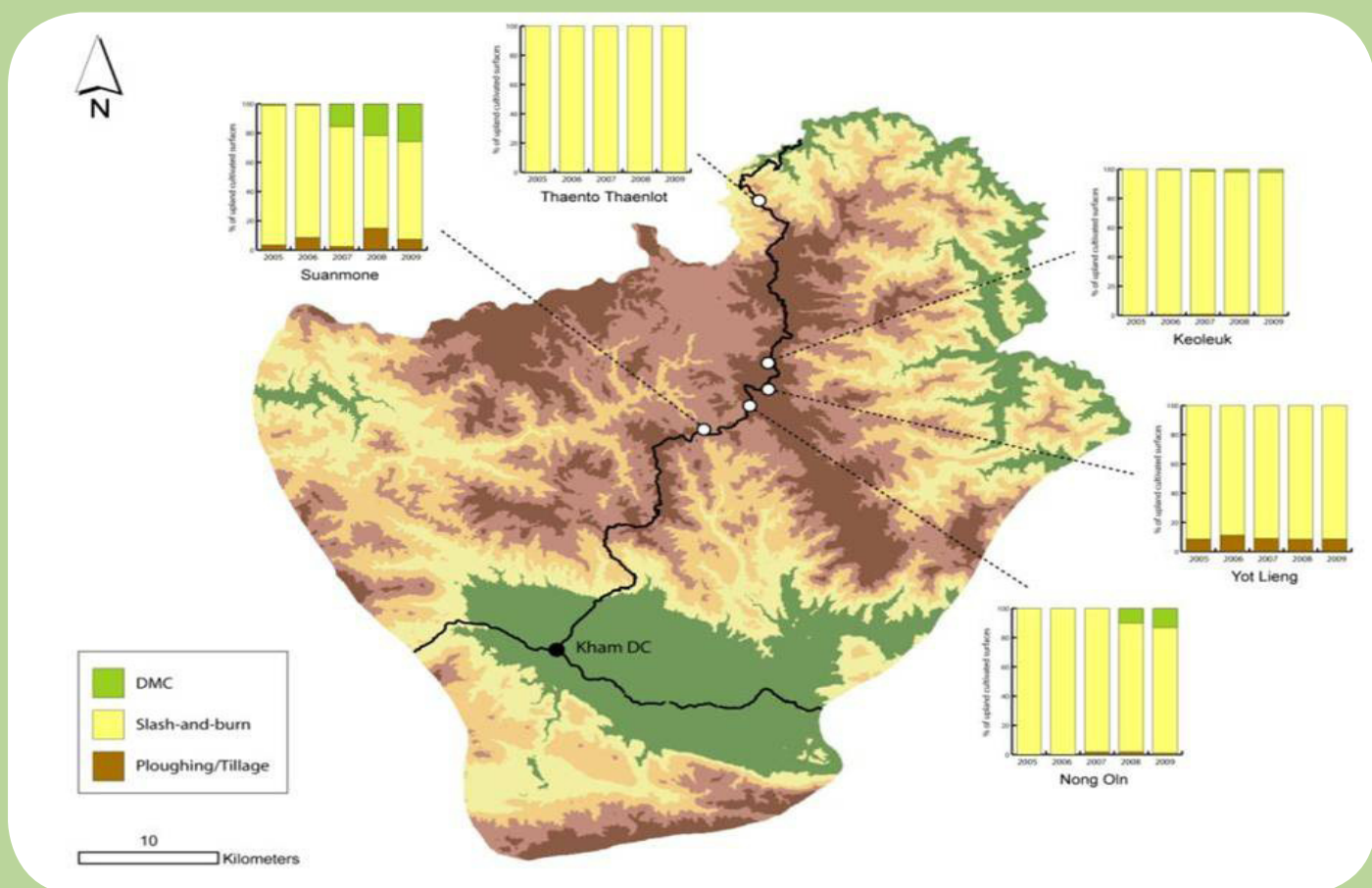
also complained that they could not sell their grass seed production after the initial stage of improved pasture establishment. By engaging in PRONAE activities, many farmers had in mind that establishing improved pastures would provide them with sufficient guarantee to gain access to bank loans. In turn, they would have the possibility to purchase cattle heads for fattening. Most of them, however, could not get access to credit and, as a result, abandoned their pastures – leaving only those farmers who already had an important cattle herd or who had enough capital to self-finance the acquisition of cattle.

Another constraint reported by farmers relates to labour requirements. Improved pastures cannot maintain themselves naturally and, without a yearly weeding, become invaded with weeds and ligneous plants. Weeding operations require important labour inputs at the same time as the upland rice plots are slashed. Many farmers prefer thus to leave their pasture invaded by weeds and focus on a key subsistence activity. Some villagers of Gnod Lieng have nevertheless been able to limit these labour requirements by introducing 'nya oysan' in their improved pastures. Originating from Nonghet district (where it constitutes the traditional feed for fighting bulls), this cane can indeed be more easily hoed than the grass species that were initially proposed by PRONAE.

Table 1: Adoption of improved pasture (% of households per village)

	2005	2006	2007	2008	2009
Keoleuk	3%	37%	53%	53%	50%
Nong oln	3%	3%	20%	7%	3%
Souanmon	10%	23%	27%	27%	23%
Thaento Thaenlot	10%	7%	0%	3%	3%
Yot Lieng	13%	33%	57%	57%	53%
<b>Kham north District</b>	<b>8%</b>	<b>21%</b>	<b>31%</b>	<b>29%</b>	<b>27%</b>

Figure 1: Distribution of ploughing, slash-and-burn and DMC systems within upland crop areas (2005-2009)



## Direct mulch-seeding cropping systems

Along with improved pastures, the PRONAE established a number of demonstration plots in Suanmone village where different techniques (i.e. slash-and-burn and DMC) and different crops (i.e. rice, maize, cassava and sorghum) were tested and compared. DMC systems experimented in these plots appeared to gain some popularity among Suanmone farmers and the share of DMC systems in the uplands increased significantly from 2007 to 2009 (Figure 1). Furthermore, while the PRONAE demonstration plots had all been returned to villagers in 2008, most of the conservation techniques developed by the programme were still applied by the plot owners the next year. This contributes to maintain a momentum that could be valorised by future extension programs. Finally and more surprisingly, some farmers of Nong Oln village have also developed DMC maize monoculture on plots made accessible through the construction of an upland road in 2009. In fact, although PRONAE did not have specific activities in this village, DMC adoption was subsequent to the participation of village leaders to study tours organized in Suanmone village and in southern Sayaboury province (where the programme has been active since the early 2000s).

As expected from PRONAE activities being exclusively focused on Suanmone village, farmers' adoption of DMC systems remained very limited in the other villages surveyed in the area. A main constraint to the dissemination of these innovative systems in the study area lies into the limited extent of commercial agriculture. The requirements of DMC systems in terms of inputs and associated financial capital provide limited incentives to farmers in areas where subsistence agriculture is predominant. As a corollary, the case of Nong Oln village illustrates that, with the emergence of commercial productions like maize, DMC systems can represent an attractive option for remote villagers – even with limited external support.

## Conclusions and recommendations

Livestock fattening is a capital-intensive activity and its promotion raises questions with respect to local investment capacities for the acquisition of both cattle and improved pastures. Some villagers of Gnod Lieng, Keoleuk and Suanmone have successfully established improved pastures and started cattle fattening activities. Yet, those who have been able to do so are generally among the

## Endnotes

<sup>1</sup> Nong Oln villagers have contracted credits in order to finance the development of a road section within the village land. Supported by a Food for Work program, Thaentho Thanlot villagers have been able to exchange road construction labour with rice.

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better-offs. They could sell cattle to finance their pasture improvement or they had other assets (e.g. small shops, regular salaries or remittances) to serve as guarantee for requesting bank loans. In that sense, while improved pasture and cow fattening have the potential to enhance land productivity in northern Kham district, financial options should be sought to facilitate the engagement of the poor in these activities. Similarly, if conservation agriculture has gained some popularity among the farmers of Suanmone and Nong Oln villages, adoption of DMC systems has been largely contingent on the simultaneous expansion of commercial maize production – allowing for sufficient cash flow and investment in farm inputs. Measures could be taken that would facilitate the engagement of poor households into livestock fattening activities and provide higher incentives for upland subsistence farmers to shift towards more productive and profitable land-uses:

1. The agricultural promotion bank should provide specific, low interest credit for cattle acquisition. Although Kham is not included in the 47 priority districts for poverty alleviation, the establishment of a branch of the Nayobay Bank, for instance, could certainly benefit upland dwellers whose poverty level is in fact much higher than the one generally encountered in the Kham basin area and in Nonghet district (a district which is classified among the 47 poorest districts of the country),
2. Facilitated access to low interest loans could also help the development of 'upland roads' and open up remote upland areas to commercial agriculture<sup>1</sup>. As observed in Nong Oln village, the productivity of the newly accessible and fertile lands could then be enhanced through DMC systems and the development of commercial crops like maize,
3. In line with the growing contribution of forest products to the incomes of upland dwellers and with the objective to ensure the regeneration of NTFP resources, agricultural and forestry services could also provide support for the sustainable management and domestication of NTFPs (e.g. cardamom, bamboo shoots and broom grass). Through the development of multi-usage living hedges (e.g. composed of bamboo, paper mulberry, jatropha), NTFP domestication could in turn facilitate the management and protection of improved pastures and DMC plots.

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