

Indigenous Agroforestry Practices of Northern Laos



Shifting cultivation is the most common agricultural practice among farmers in the northern uplands of the Lao PDR. Alongside this agricultural practice many types of indigenous agroforestry systems have been practiced for many decades as people use the forests and forested land to grow different crops.

Such practices range from a few silvicultural treatments in the natural forest to get a desired product to highly advanced systems where trees, animals and plants grow together so that they can benefit from each other. This article focuses on describing key indigenous agroforestry systems practiced in northern Laos.

This paper is based on a study carried out in 2003 within two districts, Namor in Oudomxay, and Phonxay in Luangprabang Province. Information about indigenous agroforestry practices was collected through interviews with farmers and follow-up observations in the field. 20 villages, located close to roads, were visited and at least 150 farmers were consulted in some form.

Indigenous agroforestry practices

1. Livestock practices

Managing livestock in combination with trees and pastures is common in Phonxay District. The most widespread livestock practice is the free grazing of livestock. Chickens and pigs feed close to houses, in home gardens and other nearby areas. Cows and buffalo also graze freely around the village but in a more extensive way, feeding in fallows and forests. Farmers often use the animals as investments - instead of putting money in the bank.

According to interviewed farmers, problems with this system are that:

- The animals eat un-fenced crops.
- It is difficult to watch over the cattle.
- It is difficult to identify the animals' owners.
- The animals grow quite slowly and are very thin.

The advantage is that this method uses very little labour.

Some villages also keep cattle fenced or herded. Generally, a number of farmers group together and build fences in fallow land to protect crops from being eaten. The livestock are only fenced during cropping seasons, about six months per year. A fenced area is usually 200 ha in size and holds about 40 animals. Ideally it should contain preferred grasses, such as *Imperata*, and a stream for fresh water. After some years of being used the fallow area becomes a very good rice production site. If rice is not replanted, the forest grows back.

One livestock practice found was a goat farm where 100 goats are held permanently in a fenced area of 50 ha. The goats are rotated within the area so that the land can recover.

Indigenous practices, developed and tested by farmers, are flexible and able to adapt to the changing needs of the household without the involvement of research and extension services.

Agroforestry practices integrate trees or woody perennials with crops and/or animal production fields. These techniques include hedgerows, intercropping, homegardens, alley cropping, silvopastoral systems, and improved fallows.

Pigeon pea is planted to ensure that the animals have enough fodder. Forest trees grow back in the unused areas, and after some years the goats can graze in the forest. Six families work together on this goat farm and they all stopped growing rice a few years ago. They now rely on the income from the goats, which they sell at local markets.

2. Home gardens

Home gardens in Phonxay range from 0.25 to 1 ha in size and contain fruit trees such as papaya, banana, citrus and jackfruit and vegetables such as eggplant, chilli, cabbage, and beans. In one home garden in Huay Doy, a Hmong/Khamu village high up in the mountains, more than 50 different plants are grown, mixed together or rotated within the garden. Most home gardens have a living fence of various trees or woody perennial species. Many kinds of medicinal plants are also common, especially in the older gardens.

Home gardens are located in all types of environment, ranging from mountain tops down to river valleys. Gardens are mainly situated on relatively flat land close to the village houses.

Some home gardens intercrop vegetables such as cabbage, chilli and taro with crops like rice or corn. These gardens are often slightly bigger than the traditional home garden and tend not to include the large variety of plants found in the smaller, traditional gardens. Fruit trees are common and are often either planted as borders along the contour or scattered throughout the plot.



Cooperative livestock raising by the Hmong

One interesting livestock management system, practiced by the Hmong, is raising animals in fenced areas directly in the primary forest, high up in the mountains. Here, groups of around 40 farmers fence in an area of 1,000ha, providing permanent grazing for roughly 200 animals. All families have a special ear-mark to identify their cattle. Advantages with this system are that it protects other crops from being grazed, animals get fatter, and vaccination is not necessary. It is also much easier to keep them protected from wild dogs, tigers and other threats, although herding and guarding of cattle is still necessary. The farmers stated that this system was very sustainable and that they have used it in the same area without any decline in production for a long time already.



3. Intercropping and rotational practices

Rotational systems and intercropped permanent systems are closely related to the relatively large home gardens and are usually around one hectare in size. Here the main focus is on grain crops like rice, Job's tears or corn.

In rotational systems, crops are rotated from one plot to another or are planted in succession within the same plot. Crops such as peanuts are often grown between cropping periods or as an intercrop (e.g. with corn) to provide fertiliser. Other vegetables (e.g. banana, sesame, taro and chilli) are also found within the gardens. In these systems, fruit trees like jackfruit and papaya are grown either on the border or scattered throughout the field. Such rotational practices are mostly found in valleys quite close to rivers or in moist places with good soils.

Intercropped fields contain some kind of grain crop grown with trees or other plants. One example is Job's tears intercropped with paper mulberry. After the paper mulberry is harvested, Job's tears are planted and harvested one year later. The paper mulberry is harvested every two years. This system produces crops with apparently sustainable yields every year with no fallow periods. Paper mulberry cultivation is found in rather steep areas far away from river valleys. Other intercropped areas are, however, mainly situated close to rivers and streams.

4. Entomoforestry

Entomoforestry is the practice of combining trees (forestry) and insects (entomology), as in the raising of stick-lac. Stick-lac produces a resin which is used as glue and also for colouring cloth. It can be grown in two ways, either in natural forest or in small plantation

areas. In the natural forest the insects are introduced on to branches of *Mai Faen* (*Protium serratum*) trees. Insects are introduced onto new trees and branches twice a year. The tree belongs to the person who infests it, and can be re-infested every third year. The other method of raising stick-lac is to grow pigeon pea in an open field, e.g. fallow land, and then introduce insects onto the branches. Farmers in Phonxay state that nowadays demand for stick-lac is low and enough can be obtained through the forest.



5. Improved fallow

In Namor, fallows are sometimes managed for a preferred species. One of the most common examples is the growth of different varieties of

cardamom during the fallow period. Green cardamom grows best in fallow areas, taking three years to mature from when the rice is harvested. Harvesting can continue for two years before the land has to be cleared again. Some farmers let fallows grow into forests in order to create a good growing environment for the shade-tolerant red cardamom, which can be harvested after a ten year fallow.



6. NTFP plantations

Bitter bamboo is an interesting NTFP that has been successfully transformed to a plantation crop. In the village of Ban Kuang villagers began to plant bitter bamboo directly into secondary forest some 30 years ago. These plantations still exist and, over the years, several new ones have been established. During the first years of establishment, plantations are often intercropped with pineapple. Today plantations of up to one hectare in size can be found.

Conclusions

- **Livestock agroforestry practices:** livestock raising is common in both fenced and non-fenced forms. Farmers have a wealth of indigenous knowledge about raising animals. Farmer to farmer knowledge exchanges about different livestock management systems would benefit local production systems.
- **Home gardens:** simple home gardens containing vegetables, trees and some other plants are common and are under continuous improvement, with the farmers themselves testing and evaluating new species. It seems unnecessary to make further improvements here since the farmers know best how to create and manage home gardens.
- **Intercropping and rotational systems:** these practices are relatively new and undeveloped. More knowledge is needed about sustainability and production aspects. Intensive research on identifying crops that can grow together, especially without fallow periods, is essential if practices like this are to be an option for farmers.
- **NTFP plantations:** this system has high potential and will be necessary if NTFP production is to increase. Knowledge is currently limited, and practice not widespread, but there are some interesting examples of successful NTFP plantations. More research on potential NTFP plantations can generate important upland cropping options for farmers.

This paper is adapted from: "Indigenous Agroforestry Practices in Two Districts in the Northern Part of the Lao PDR" in *Poverty Reduction and Shifting Cultivation Stabilisation in the Uplands of Lao PDR: Technologies, approaches and methods for improving upland livelihoods*. NAFRI. 2005.

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Improving Livelihoods in the Uplands of the Lao PDR was produced in 2005 by NAFRI, NAFES and NUOL.