

### Specific tree species preferred for use as firewood in Central Laos

The villagers of Laos harvest non-timber forest products (NTFPs) from forests for daily use. One of the many NTFPs obtained from forests is firewood, their main fuel source. Based on a survey in N village, each farming household consumes approximately 1.94 tons per year or a total of 272 tons per year for the village's 140 households. This is equivalent to 16 hectares of forest area. Villagers prefer two species in particular, and this has had a major influence in decreasing the number of forest trees in central Laos.

Firewood harvesting areas at the target villages in Vientiane Capital were also surveyed. The areas are about 30-60 minutes by foot from the village center and the villagers largely focus on hilly areas where timber harvesting is permitted. A single harvest requires about three to four hours. Besides leftovers from slash-and-burn operations, firewood also comes from living trees that have been cut down (Fig. 1).

Firewood is used mostly as cooking fuel and for adjusting feed for livestock (pigs, chickens). The difference in usage per household is small. On average, a household uses about 1.94 tons (dry weight) per year, thus the amount of firewood consumed by the whole village's 140 households comes to about 272 tons per year.

A survey was also conducted to calculate the vegetation of firewood harvesting areas (5-year fallow) and forest areas using the biomass estimation equation for slash-and-burn fallow forests. Results showed that the village's yearly consumption is equivalent to 16 hectares of felled trees. Areas where firewood harvesting is permitted total to about 800 hectares.

About 50 tree species, including bamboo, are used as firewood. Of those consumed, people prefer the two species, *Cratoxylum* sp. (Hypericaceae), which is preferred by survey respondents, and *Peltphorum dasyrachis* (Fabaceae) (Fig. 2). People prefer these two species because of their burning efficiency and heat retention qualities. The potential yield of *Cratoxylum* and *Peltphorum* is 0.12 and 0.28 ton per hectare, respectively. The demand for these two particular species is especially high, thus planting these tree species will expectedly reduce the amount of labor for harvesting firewood and ensure a stable fuel supply.

Projects in the forestry field, like those implemented under REDD+, are aimed at obtaining basic information upon investigation of the amount of firewood taken from forests. Because forest vegetation changes depending on the region or fallow length, carrying out a vegetation survey of the applicable region is necessary in order to estimate forest area from firewood consumption information.

Due to the high demand for these tree species, setting up a community forest where members can harvest firewood is suggested. In particular, 'white' charcoal produced by burning *Cratoxylum* fetches a higher price than black charcoal, thus higher added value can be expected if this species is selected for planting. Furthermore, community forestry of *Cratoxylum* sp. is expected to not only positively affect labor hours but also improve everyday rural life.

(K. Kimura, R. Yoneda, Bounpasakxay Khamphumi [Forest Science Research Center], Singkone Xayalath [FSRC])

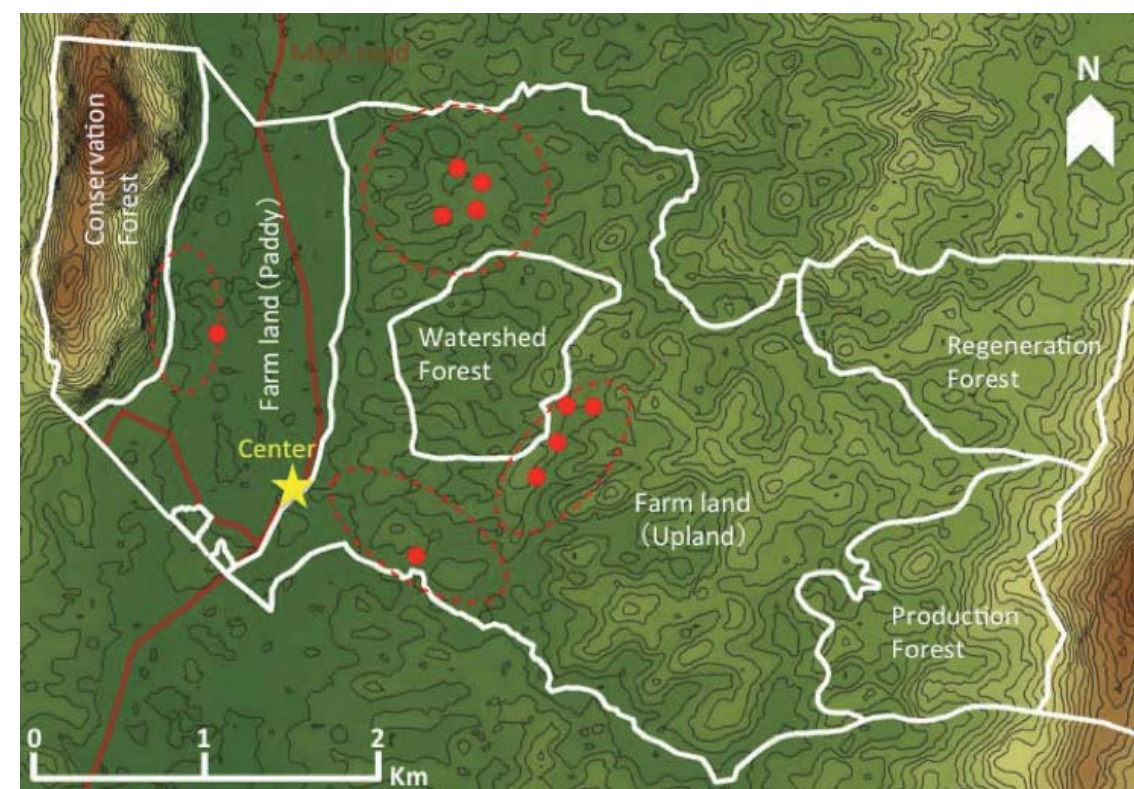


Fig. 1. Firewood harvest locations of target survey villages in Vientiane Capital. Red dashed lines are harvesting lands as indicated by farmers. Red dots are actual 2013 harvesting sites. Contour interval is 20m.



Fig. 2. Villagers prefer these tree species for firewood use (Left: *Cratoxylum* sp., Right: *P. dasyrachis*)