

How best to support livelihoods of blacksmiths with minimum impact on forest products

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According to the International Food Policy Research Institute, 70% of Nepal's population and nearly all people in rural districts depend on subsistence (Ojha et al. 2009), in which forest products play an important role. The traditional division of labor in Hindu social systems has resulted in the transmission of specific occupations and expertise over many generations. Although education and new economic opportunities have blurred the boundaries of ethnic professions, a large proportion of the rural population still rely on the traditional expertise of the local blacksmiths who make their agricultural tools and domestic utensils.

Blacksmiths have had a long and intimate relationship with forest products. Their furnace, tools and other equipment are of traditional design and local manufacture. The source of heat in their workshops is charcoal, made of hard wood derived from various tree species. Charcoal is the solid residue remaining when wood is 'carbonized' or 'pyrolysed' in a closed space such as a charcoal kiln. The passage of air into the closed chamber is controlled during pyrolysis or carbonation process so that the wood does not merely burn away to ash as in a conventional fire, but converts to form charcoal (FAO 1987). With the recent wave of national forests being handed over to community for management, policies for resource harvesting are largely determined at the local level. The extent to which community forests can support various social needs (timber, fodder, charcoal, firewood, medicine, food, etc.) partly depends on policy decisions made by communities. We conducted a pilot study to assess protocols for sustainable charcoal production.

We investigated the feasibility of utilizing waste products from community forests for charcoal production. The quantity of diseased, decayed and dried (3D) trees of various species used in charcoal production seemed to closely match production from healthy trees (Figure

1). Charcoal production from healthy trees in the community forest studied was found to be somewhat more than 12 kg for every 100 kg of wood, on average; charcoal production from 3D trees was 10.25 kg out of every 100 kg, or 15% less on average, with a discrepancy of between 9.5% and 20.5% for the various species studied (Figure 1).

We also collected information on the socioeconomic status of blacksmiths in the study area by means of a questionnaire survey; we interviewed every blacksmith households that relied on the studied community forests. This survey was implemented with semi-structured interviews and informal discussions on community forestry utilization for firewood and charcoal. There were 16 households with 88 persons, with equal numbers of males and females and a mean household size of 5.5.

Half of the households were fully dependent on

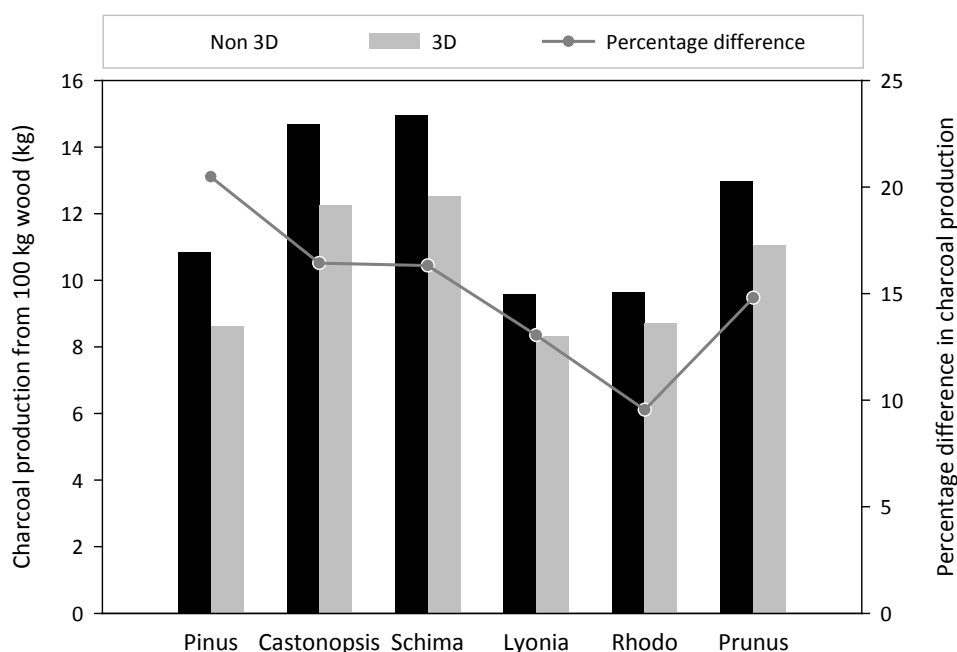


Figure 1. Charcoal production from 3D (diseased, decayed and dried) and healthy (non 3D) trees. We measured charcoal production from 3D trees and compared to production from healthy trees (non-3D) in Karnel Community Forest of Patlekheta Village Development Committee in Kavrepalanchowk district, 40 km southeast from Kathmandu. The trees were chopped into small pieces and fresh weight of 100 kg of each tree was put into a pit to make charcoal (our 3D samples did not seem to be much drier than non-3D samples). The forest is dominated by *Pinus roxburghii* ("Khote Salla"), but the following species are also easily available in community and private forests: two tall broadleaf tree species *Castonopsis indica* and *Schima wallichii*, and three medium to short trees *Lyonia ovalifolia*, *Rhododendron arborium* ("Rhodo" in figure) and *Prunus cerasoides*.



blacksmithing for their livelihood. The other eight households, in addition to blacksmithing, depended on revenue from agricultural labor and freelance services on the local market. Unstructured interviews revealed that 75% of the blacksmithing work involves making agricultural and domestic tools for other rural people. Blacksmith families have very little land for agricultural production, with 14 families entirely lacking land for rice production. They, instead, have some land for vegetable and agricultural production including staples. Ten households had 1–3 ropanis (1 ropani = 5476 sq ft = ~1/8 acre) of such land called *bari*, four households had 4–6 ropanis and the remaining 2 households had 7–10 ropanis of *bari*.

Conclusion

Nepal was one of the early leaders in promoting decentralization of natural resources (Agrawal et al. 1999). The enthusiastic participation of local people has resulted in the nation's remarkable success in implementing community-based forest management (Gautam et al. 2004) resource management. The concept of community forestry was specifically designed to address the problem of environmental degradation while supporting the livelihoods enhancement of rural people (forest user groups) through increased forest supplies for their daily needs (Gautam 2009). Blacksmiths in the study area, and in general, are among the poorest members of their communities. They depend for their livelihood almost exclusively on their traditional skills; in the study area, 88% of the blacksmiths have no land for rice or staples production. This study indicates that one of the ways to supporting the livelihood of blacksmiths would be to provide diseased, decayed and dried (3D) trees exclusively to them. Since 3D trees are valued at a much lower price than healthy trees, this measure would increase the profitability

of blacksmithing. While 3D trees are almost useless for other purposes, such trees are almost as good as healthy trees for charcoal production purposes. However, the removal of 3D trees from the forest also makes space available for regeneration and prevents heterotrophic respiratory loss of photosynthetically fixed carbon, thereby reducing the community's carbon footprint.

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