A scientific assessment of traditional knowledge on firewood and fodder values in Sikkim, India

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Communities in the Yuksam-Dzongri trekking corridor of Sikkim use a wide variety of plant species as firewood and fodder with species preferences based on their local knowledge. Current practices are increasing harvest pressures on good quality firewood and fodder plants leading to deteriorating forest condition along the trekking corridor. To help develop management strategies and to ensure the long term sustainability of forest resources in this region, it is important to understand local peoples' basis for their species preferences. In this paper, we compared people's preferences for species used as firewood and fodder using Participatory Rural Appraisal (PRA) tools with data on these species' chemical constituent properties to better understand the rationale for local preferences. Sixteen woody trees species (Rhododendron arboreum, Rhododendron falconeri, Rhododendron barbatum, Quercus lamellosa, Q. lineate, Schima wallichii, Prunus cerasoides, Prunus nepalensis, Castanopsis hystrix, Beilschmiedia sikkimensis, Acer oblongum, Betula alnoides, Eurya acuminate, Symplocos ramosissima, Alnus nepalensis and Litsaea elongate) and twenty-three fodder plants (including Thysanolaena maxima, Ficus nemoralis, Q. lamellosa, Imperata cylindrical, and Saurauia nepaulensis), the most widely used species in the area, were selected for study. The tree species were evaluated for their wood properties (calorific value, wood density, moisture and ash content) based on the Firewood Value Index (FVI), and fodder species for their nutritional qualities (dry matter, nitrogen and crude protein, and fat content). Most of the highly preferred species were found to have high values for firewood or fodder properties, and a significant correlation was found between the community scores and the FVI and some fodder attributes, namely dry matter and protein content. The study illustrates the applicability of local knowledge in relation to the chemical properties of species used for firewood and fodder.