Non-Timber Forest Products as Alternative Livelihood Options in the Transborder Villages of Eastern Nepal

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Technology transfer for efficient harvesting of non-timber forest products (NTFP) and development of marketing channels are avenues to sustainable livelihoods.

Introduction

Biodiversity conservation is a top priority among all nations and this has led to the establishment of many protected areas (PA) and nature reserves (Brooks et al. 2004). Despite efforts to conserve endangered or threatened ecosystems, the sustainability of both human livelihoods and wildlife conservation is still a problem (Borrini-Feyerabend et al. 2004). In order to both address the people's need for sustained livelihoods and protect the natural environment, the right approach to conservation and development is essential. The transboundary biodiversity management initiatives of ICIMOD are engaged in developing transboundary conservation landscapes linking protected areas in the Kangchenjunga complex covering parts of Bhutan, India, and Nepal (Sharma and Chettri 2005). The approach works well for safeguarding PAs

and the buffer areas around them if local communities are taken into account. The initiative is also exploring ways of strengthening conservation linked livelihood options for people in the complex to improve their living standards while ensuring sustainable use of resources available across national borders.

This study looks into the livelihood options and potentials of non-timber forest products (NTFPs) in 12 village development committee areas (VDCs) bordering India in eastern Nepal: Memeng, Siding, Prangbung, Chyangthapu, and Falaincha in Panchthar district, and Maipokhari, Maimajuwa, Maabu, Jamuna, Jogmai, Gorkhe, and Pashupatinagar in Ilam district. A total of 146 households (ranging from seven to 16 houses depending on the size of each VDC) was surveyed to examine natural resource use patterns.

The economy of the area is land based. Average landholdings per household are about one hectare in Panchthar district, and about two hectares in Ilam. About 80% of the landholdings are individually owned and 20% are 'adhiya' (land given to other people for cropping for half the crops produced). Most of the land is rainfed ('bari'), about 61% in Ilam. Irrigated land ('khet') accounts for 23% of the total land cultivated in Panchthar but only four per cent in Ilam (Figure 1). Cardamom plantations are found on nearly 18% of the total land in both districts. In many VDCs, land is left fallow for livestock grazing.

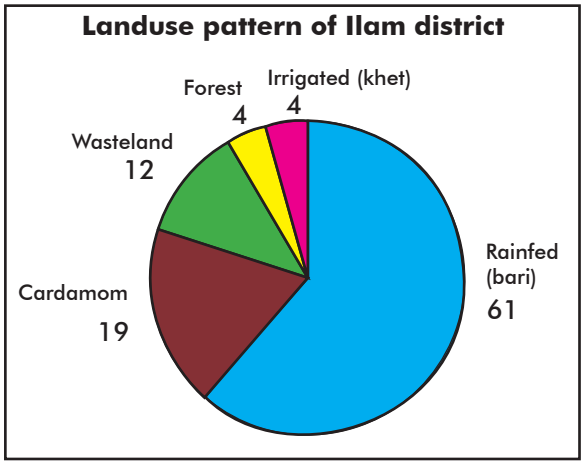

Figure 1: Different land-use types reported from the two districts of eastern Nepal

Livestock rearing is one of the major activities in these districts: livestock are mostly stall fed in Ilam, but in Panchthar they are mostly grazed with partial stall feeding. Animal husbandry is an important occupation in all areas. Milk and milk products are important market commodities. Successful agroforestry practices have led to the maintenance of greenery, ecosystem stabilisation, and a relatively stable economy. Planting broom grass on steep terraces is common practice.

Cardamom cultivation with moisture-loving shade trees and tea cultivation are characteristic of the landscape in these eastern Nepal districts. Edible crops grown in agroforestry systems, such as maize, ginger, paddy, millet, wheat, and vegetables (cash crops), are evident in Ilam. Such cultivation is slowly being adopted in Panchthar. A total of 41 plant species are used as fodder in Panchthar with 20 species coming from the forest and the remainder from agroforestry systems or from trees maintained on farmlands. Common fodder species include 'dudhilo' (*Ficus nemoralis*), 'nebaro' (*Ficus roxburghii* and *Ficus hookerii*) and 'gogun' (*Saurauria nepaulensis*). In Ilam, about 30 plant species are used; the majority of them coming from

agroforestry plots. Popular timber species include 'falant' (*Quercus glauca*), 'chilaune' (*Schima wallichii*), 'uttis' (*Alnus nepalensis*), and 'chanp' (*Magnolia* spp). Average timber use per household is 30-50 cubic metre, with a yearly demand of 300-500 cubic metres. Firewood is the principal source of energy and is used for cooking, preparing animal feed, heating water, heating in winter, curing cardamom, preparing alcohol, and making 'chhurpi' (dried cheese).

Non-timber Forest Products (NTFPs)

Gathering forest species for food, medicine, shelter, and other uses dates back to early human civilisation. Some of these traditions continue to this day and are an important part of the heritage and culture in the two districts. NTFPs make a significant contribution to the local economy.

Use of NTFPs at the household level

NTFPs commonly collected for medicinal purposes include 'bikhma' (*Aconitum palmatum*), 'kutki' (*Neopicrorhiza scrophulariiflora*), 'khanappa' (*Evodia fraxinifolia*), 'pakhanbed' (*Bergenia ciliata*), 'chinfing' (*Heracleum nepalense*), and 'panchaunle' (*Dactylorhiza hatagirea*). Cultivation of 'chiraito' (*Swertia chirayita*) also began a few years ago. Among the aromatic plants, 'dhupi' (*Juniperus* sp) and 'sukpa' (*Juniperus indica*) are collected more frequently than 'seto chandan' (*Matricaria chamomilla*), 'bhimsenpati' (*Buddleja asiatica*), and 'sughandawal' (*Valeriana jatamansii*). Fibre-yielding plants are more prevalent in distant villages near the Indian border, 'argeli' (*Edgeworthia gardneri*), 'allo' (*Giardiana diversifolia*), and 'lokta' (*Daphne bholua*) are planted on the sides of field terraces in Falaincha, Chyangthapu, Memeng, and Prangbung VDCs. The former three VDCs have established cottage paper industries. Other VDCs in the area export semi-processed products such as bark or pulp to these cottage paper industries.

Wild edibles collected by villagers are mostly food supplements. Major wild edible species include 'katus' (*Castanopsis indica*), 'tarul' (*Dioscorea species*), 'ainselu' (*Rubus ellipticus*), and 'siltimbur' (*Lindera neesiana*). Besides the use of NTFPs as medicine, fibre, and wild edibles, the bark of 'majito' (*Rubia manjith*), 'gobre sallo' (*Pinus wallichiana*), and 'uttis' (*Alnus nepalensis*) are used to produce dye. Many ornamental species along with beverages like tea (*Thea sinensis*) and spices such as 'tejpat' (*Cinnamomum tamalla*) are also cultivated as NTFPs.

Potential NTFPs for domestication and commercialisation

The local people are well aware of collecting seasons, methods, and frequency of collection of specific products (Box 1). Many medicinal plants are closely associated with the culture and traditions of the local communities.

Box 1: Local belief associated with the use of medicinal plants

Medicinal plants such as 'chimphing' (*Heracleum nepalense*) and 'khanappa' (*Evodia fraxinifolia*) is plucked on the first Tuesday after the Teej festival. This practice is known as 'Harlo'. The people believe that the medicinal plants plucked that day are extremely effective and potent.

Large cardamom cultivation has been popular for a long time in these areas. Earnings from cardamom provide important income for local farmers. Similarly other NTFPs, such as 'chiraito' (*Swertia* spp), 'bonjo' (*Acorus calamus*), 'dhupi' (*Juniperus species*), 'argeli' (*Edgeworthia gardeneri*), lily (*Lilium* spp, a wild flower locally known as 'jaighantam'), and 'titepati' (*Artemisia vulgaris*) are slowly being brought into a successful domestication process for income generation.

Commercialisation of NTFPs ranges from their consumption at the local level to the export of unprocessed NTFP materials to districts nearby and even across the borders. Local traders or middlemen are mostly involved in dealing with NTFP trade and export. In fact, they even run collection centres in major towns in the VDCs. Market limitations for farmers have benefited local traders who procure products from farmers at nominal costs and later trade them at higher prices.

Local Institutions

Community forest user groups (CFUGs) and the District Forest Office (DFO) in Ilam have the capacity to build nurseries and are cultivating many of the NTFPs, especially medicinal and aromatic plants (MAPs). Technical knowhow in processing raw materials into marketable products is limited. One non-government organisation, Uccha Pahadi Jadibuti Kendra, has some expertise in technical processing of medicinal plants and is taking the initiative in cultivating and marketing them (Box 2).

Box 2: Uccha Pahadi Jaributi Kendra

Uccha Pahadi Jadibuti Kendra was established in 2003 in Maipokhari, Ilam, with the goal of producing and marketing medicinal, aromatic, and ornamental plant products, and of conserving these plants. About 66 types of medicinal, aromatic, and ornamental plants have been planted.

Illegal Harvesting and Trade in NTFPs

Medicinal plants, cardamom, tea, broom, and other non-timber cash crops are all exported unprocessed in large quantities across the border in India. The DFO in Ilam recorded an increased trend in NTFP exports in 2001-2002 compared to previous years. Exports of 'chiraito' and 'lokta', however, have decreased in recent years mainly due to restrictions by Indian officials in the border areas. Illegal harvesting and trade of NTFPs are not reported directly; however, evidence was given during informal discussions with local farmers. Collection of species such as 'bhikhma' (*Acsponitum palmatum*), 'kutki' (*Neopicrorhiza scrophulariiflora*), 'jaikhantham' (*Lilium* spp), 'panchaunle' (*Dactylorhiza hatagirea*), 'dhupi' (*Juniperus* spp), 'sukpa' (*Juniperus indica*), 'sunpati' (*Rhododendron anthopogon*) and 'lauth salla' (*Taxus baccata*) is increasing every day. Only a small quantity of NTFPs is consumed locally, they are exported unprocessed through major routes from Ilam and Panchthar to Siliguri in West Bengal, India.

The estimated quantities of NTFPs exported to neighbouring countries are given in Table 1. It seems that Ilam and Panchthar are producing large quantities of NTFPs and exporting them to the neighbouring towns of Siliguri with chiraito predominant.

Table 1: **Major NTFPs and estimated quantity exported from the two districts (tons/ year)**

NTFP species	Ilam	Panchthar
Chiraito (*Swertia chirayita*)	21.14	15.35
Bikhma (*Aconitum palmatum*)	2.22	1.63
Kutki (*Neopicrorhiza scrophulariiflora*)	1.67	2.94
Bodookhati (*Astilbe rivularis*)	2.22	0.65
Pakhanbed (*Bergenia ciliate*)	1.67	0.65
Chimphing (*Heracleum nepalense*)	4.45	4.25
Panch aunlee (*Dactylorhiza hatagirea*)	0.56	0.33
Khokhim (*Bergenia purpurascens*)	0.56	0.65
Timur (*Xanthoxylem armatum*)	13.35	9.80

Conservation Initiatives

Local farmers have a lot of knowledge about the use of NTFPs and their conservation. Conservation initiatives, such as villager clean up campaigns and restoration and management of forests and water resources can be seen in most of the VDCs. Some VDCs also carry out community forestry to restore the forests while some establish plantations on farmland. Landslide prevention methods are used in Jamuna VDC; in Jogmai VDC, river diversions and pipeline extensions for drinking water are also built alongside road construction and maintenance. Transfer of technology and skills (along with cultural exchange) is prevalent among the residents of these two districts and the people from the state of Sikkim and Darjeeling in India.

Conclusion

The rural mountain population in the study area is closely linked to their natural resources. Their economy is largely dependent on agriculture and rearing livestock. Rainfed agriculture is supported and improved by organic manure from the forests and livestock. Diversified animal products, such as milk, soft and hard cheese, butter, meat, and fur have always been good sources of earning for the villagers in Ilam and Panchthar districts.

Interest in NTFPs is increasing rapidly. Agroforestry innovations in the form of large cardamom and broom-grass cultivation have supplemented the incomes of rural people. Cultivation of medicinal and aromatic plants and their use as cash crops are recent. Villagers are well aware of collecting seasons and the use of specific products of many medicinal and aromatic plants. Cultural exchange is closely associated with indigenous technologies and farming practices. Indigenous knowledge should be tapped and documented. Intensive training on cultivation, conservation, and processing techniques for NTFPs, needs to be carried out on a large scale. Training needs are felt more in the mountain villages of Panchthar district. Strengthening of local institutions so that they can provide training is highly recommended, as they are more accessible to the local community.

Active management of NTFP collection and cultivation can help maintain ecosystem complexity and also play an important role in restoring biodiversity. Extraction of a broader range of natural resources than timber products can lead to economic diversification and stability for rural forest and mountain communities. Setting up national, regional, and global marketing channels for the products will open up avenues for improved access and bring increased benefits to local people. Managing forests by focusing on NTFPs will also help increase the long-term value of forest resources, and such initiatives could contribute to biodiversity conservation and sustainable forest management of this important biodiversity-rich landscape.

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