



## Challenges and opportunities for Nepal's small and medium forest enterprises (SMFEs)





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Asia Network for Sustainable Agriculture and Bioresources  
Kathmandu, Nepal

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## EXECUTIVE SUMMARY

This report is part of a cross-country research initiative that focuses on small and medium forest enterprises (SMFEs) and their potential to contribute to poverty reduction and sustainability. It is based on a scoping study designed to gather background information, present key issues, and identify research priorities. The study was coordinated and implemented in Nepal by ANSAB, in collaboration with FAO. This report builds on the findings of earlier ANSAB research and intends to synthesize the learning of different Nepalese stakeholders.

SMFEs have traditionally served as a means of sustaining rural livelihood in Nepal. Most of the rural people, especially in the hills, depend on the collection of non-timber forest products (NTFPs) to sustain their livelihood. SMFEs are being established to help reduce poverty through employment generation, both through self-initiation of local communities and through technical and financial support from government agencies, bilateral and multilateral projects. The majority of SMFEs are associated with community forest user groups (CFUGs) that are formed under Nepal's three decades of community forestry program. At present, there are over 15 000 CFUGs and approximately one third of the population is participating in the management of 21 percent of the country's forest area (CPFD, 2006). In addition to NTFP-based SMFEs, wood-based enterprises, such as furniture making and agricultural tool manufacturing, and wood depots are also increasing in local market centres.

The SMFEs sector has the potential for rapid growth in Nepal's industrial sector. For instance, the Tenth Five-Year Plan (2002–2007) recognized the potential for sustainable use and management of forest resources for poverty alleviation, especially through the promotion of forest-based micro and small enterprises. More broadly, micro, small and medium enterprises (MSMEs) account for 70–80 percent of the total value of Nepal's industrial production, 80 percent of the employment, and 70 percent of the value of all exports. These enterprises create local jobs and support the establishment of new industries in rural areas.

In this study, we have compiled and presented information on some of the major SMFEs in Nepal. We have also presented a diagnosis of five major traded NTFPs i.e. Lokta (*Daphne species*), Jatamansi (*Nardostachys grandiflora*), Chiraito (*Swertia chirayita*), Kurilo (*Asparagus racemosus*) and Wintergreen (*Gaultheria fragrantissima*), and a timber species of Sissoo (*Dalbergia sissoo*). These six species and their products are the ones that are commonly traded or cultivated. Through that we have attempted to reflect the status of the sector in general and the connectedness of SMFEs to markets, service providers and policy processes.

Of the six products, Kurilo occurs in tropical and subtropical regions, and its root is used in Ayurvedic medicine for its tonic and galactogogue properties. It occurs in natural, government-owned forests and is also increasingly cultivated in private and community lands for commercial purposes. About 60 to 200 tonnes of Kurilo are collected annually from Nepal and sold semi-processed in the Indian market (boiling and drying). Only a few Ayurvedic companies use Kurilo as their raw material; the main bulk is exported and

the market price is increasing. Similarly, Chiraito occurs in subtropical and temperate regions of Nepal, and the whole plant is used as an antipyretic and bitter agent in beverages. In eastern Nepal, Chiraito is being massively cultivated and exported, mainly to India, and a small percentage to Tibet. Contrary to price trends since the 1990s, its price has steadily declined since 2003.

Another product covered in the diagnostic study, Jatamansi, is found in temperate and alpine regions, with significant amounts collected from Midwestern Nepal. While Jatamansi rhizome is banned for export in its unprocessed form, it is mainly exported in its crude form illegally and a small amount is processed inside Nepal. Rhizome can be distilled to produce essential oil which is used in natural fragrances and aromatherapy. Similarly, another important product is Wintergreen. It is found mostly in subtropical and temperate regions, in natural forests, and is cultivated in private lands. The well-known wintergreen oil is distilled from its leaves; the oil is used as a painkiller and a food additive. There are several small and medium distillation enterprises successfully operated by CFUGs in the mid-hills area which supply wintergreen oil to domestic and foreign companies.

In addition, Lokta is famous for Nepali handmade paper, which is prepared from the bark using traditional knowledge and technology. The Lokta shrub is found in temperate and alpine regions, and is found abundantly in nature, with very limited plantations in eastern Nepal. While Nepali handmade paper has been used for official purposes, especially in legal documentation in Nepal, the Forest Stewardship Council (FSC)-certified handmade paper is also being exported to the US market. The simplicity of its technology and the availability of raw materials make Lokta especially conducive to employment generation in remote areas. Lokta paper is also used to make several handicrafts and gift items, which are sold in domestic and export markets. The only timber species covered in this report – Sissoo – is particularly valued for its fine texture and fast growth. It occurs naturally in riverine belts of tropical and subtropical regions, and is grown extensively by farmers and CFUGs. It is used mainly for furniture and thus is the principal product in sawmills and the furniture industry. Sissoo is one of the most potential valuable species for afforestation and a good source of cash income for poor and middle-income farmers from Nepal's southern low belt.

SMFEs and the industrial sector broadly are in a nascent stage in Nepal. However, since the 1990s, small and medium-scale industries are growing in number and size. SMFEs are operated by private companies, CFUGs (or their consortia) and individuals. While the government has made promises to promote the private sector and the industrial environment, there are several policy and legal challenges for new enterprise to emerge and flourish. The global consumer preference and market for natural products provides important opportunities to promote Nepal's medicinal and aromatic plants as well as a wide variety of natural products. Accordingly, several export companies have recently emerged; these cater specifically to such niche markets in developed countries.

There are important areas of work, in which the government, the private sector and donor communities could promote SMFEs in Nepal. Existing policies and laws on SMFEs are quite ambiguous and contradictory and need to be further clarified taking into account the specific nature of forest-based enterprises. Stakeholders need to work

together to develop a comprehensive set of support services, including those for market information, business development services, financial services and access to technology, to encourage the growth of SMFEs in Nepal. A research component should complement these services so that local people and other stakeholders have sufficient knowledge on specific value chains, market trends, legal and policy issues, as well as on resource management. In addition, there is a need for collaboration and coordination among government agencies, donor projects and the private sector to streamline the support to SMFEs.



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## ACRONYMS

ACP	Association of Craft Printers
ANSAB	Asia Network for Sustainable Agriculture and Bioresources
BCP	Bhaktapur Craft Printers
CBO	Community Based Organizations
CBS	Central Bureau of Statistics
CF	Community Forest
CFUG	Community Forest User Group
CSI	Cottage and Small-s Scale Industry
CSIDB	Cottage and Small Industries Development Board
DADO	District Agriculture Development Office
DANIDA	Danish International Development Agency
DCSI	Department of Cottage and Small Scale Industry
DDC	District Development Committee
DFO	District Forest Office
DLSO	District Livestock Services Office
FAO	Food and Agriculture Organization of United Nations
FECOFUN	Federation of Community Forest Users, Nepal
FINIDA	Finnish International Development Agency
GDP	Gross Domestic Project
GTZ	German Technical Cooperation Organization
HPPCL	Herbs Production and Processing Co. Ltd
HVC	High Value Crops
I/NGO	International/Non- Governmental Organization
JABAN	Jadibuti Association of Nepal
LFP	Livelihood and Forestry Programme
MFDB	Microfinance Development Bank
MFIs	Micro Finance Institutions
MIT	Micro Irrigation Technology
MPFS	Master Plan for the Forestry Sector
MSE	Micro and Small Enterprise
MT	Metric Ton
NGO	Non-Government Organizations Associated with RSRF
NPP	Nepal Paper Printers
NTFP	Non-Timber Forest Product
SFCL	Small Farmers Cooperatives Limited
SNV	Netherlands Development Organization
TPC	Trade Promotion Centre
UNDP	United Nations Development Program
USAID	United States Aid Agency for International Development
VDC	Village Development Committee



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Bhishma P. Subedi, PhD  
Executive Director



# INTRODUCTION

## BACKGROUND

In August 2007, ANSAB and FAO entered into an agreement to initiate "Forest Connect" project activities in Nepal. The overall goal of the Forest Connect project is "to substantially reduce poverty for forest-dependent people in key partner countries by increasing the number of successful and sustainable small forest enterprise associations". To support this goal, the Forest Connect Nepal programme has been initiated through ANSAB as the Nepal Program Partner with the following objectives:

- to increase the visibility of the specific small and medium forest enterprise (SMFE) sector within Nepal;
- to work towards the increase of the level of organization and connectedness of 'Forest Connect' SMFE members to markets, service providers and policy processes;
- to increase the viability of 'Forest Connect' members in the market, and in the first year, to develop contacts with SMFEs so that future efforts to connect them to markets, service providers and policy processes are possible.

Under these three major objectives, the main task for this year was to conduct a full diagnosis of SMFEs and their associations within Nepal, covering specific forest products and with emphasis on 'community-based' SMFEs.

Small and medium forest enterprises (SMFEs) are critical to the poor. They generate local wealth, help ensure local resources and environmental accountability, promote local creativity and contribute to the preservation of indigenous cultures and market niches. But while the number of SMFEs starting up in least developed countries is high, keeping them going sustainably is a major challenge. They face problems such as too much bureaucracy, unstable policies and regulations, insecure land rights, lack of bargaining power, insufficient business knowledge and difficulties to access credit, market information and technology.

Many SMFEs work together in associations to reduce transaction costs, adapt to new market opportunities and shape the policy environment in their favour. But in least developed countries, such as Nepal, support structures for such forest associations either do not exist or fail to reach those who need help the most. The central aim of this project is to connect SMFEs to:

- National forest programmes (empowering SMFEs to be heard by policy makers);
- Emerging markets (by supporting existing SMFE associations); and
- Service providers (strengthening their capacity to provide training and finance).

This diagnostic study was conducted on the basis of previous work carried out by ANSAB through various projects in Nepal. This report provides a diagnosis of community-based SMFEs and their associations in Nepal, covering specific forest

products. Five non-wood forest products (NWFPs), one timber product and their corresponding enterprises are selected as a sample to traverse the entire connectivity of the forest, poverty and livelihoods. The NWFPs covered in this study include Lokta (*Daphne species*), Jatamansi (*Nardostachys grandiflora*), Chiraito (*Swertia chirayita*), Kurilo (*Asparagus racemosus*), and Wintergreen (*Gaultheria fragrantissima*), while the timber species is Sissoo (*Dalbergia sissoo*). These specific products and their enterprises are selected on the basis of the following criteria. The following criteria were finalized by ANSAB experts, field staff and a study team:

- these products have demonstrated their commercial value at national, regional or international level;
- these products offer opportunities for value addition and increased productivity at local level, thereby providing opportunities for poverty alleviation;
- they are available in sufficient quantity to allow for sustainable commercial harvesting and have the potential to be brought under locally managed regeneration systems and/or domestication;
- these products involve a complex interplay of several actors with varied levels of access and control, and offer opportunities for good governance interventions;
- these products are not only a government priority but are also very valuable non-timber forest products in Nepal and the western market;
- some successful community-based enterprises of these products are: (a) Malika handmade paper enterprise, Bajhang for Lokta; (b) Deudhunga Multipurpose Cooperative, Dolakha for Wintergreen and; (c) Humla Oil Enterprise, Humla for Jatamansi. Many of the dynamics noted for Lokta, Wintergreen and Jatamansi, and their corresponding enterprises, also apply to other NWFPs and SMFEs in Nepal.

Chiraito, Lokta, Jatamansi and Wintergreen are found throughout the hilly region of Nepal and Kurilo is found in the Terai and the mid-hills. All these are considered as major commercial NTFPs products. The districts of Dolakha (Central region, hills), Parbat (Western region), Humla (Mid-Western region), Taplejung, Panchthar (Eastern region), Bajhang and Darchula (Far Western region), and Sarlahi (Central region, Terai) are selected for this study for the following reasons:

- the existing natural resource base acts as a significant local source of products for subsistence and economic activities;
- large volumes of Kurilo, Chiraito, Lokta, Jatamansi and Wintergreen are currently harvested from these districts, and there is potential to expand their commercial activities;
- cultivation, drying and primary processing of Kurilo and Chiraito as well as papermaking enterprises and distillation units are operating in these districts;
- different programs and projects of ANSAB have been running in these districts so ANSAB has more access to the information relevant to this study.

In this study, we have compiled and presented information on some of the major SMFEs in selected districts and thus attempted to reflect the general status of the sector. Generally, there was a lack of disaggregated data regarding small and medium forestry enterprises, while a more comprehensive field-based survey was beyond the scope of

this study. The study strongly indicated that the bulk of forest produce processing in Nepal is carried out by SMFEs, and these enterprises play an important role in the national economy.

In Chapter 2 of this report, we commence by presenting a brief overview of SMFEs in Nepal. Then we present the current status of SMFEs in Chapter 3. This covers important aspects of the SMFEs: ownership and management structure, raw materials consumption and sources, employment situation, geographic distribution of SMFEs, seasonality of the operations, processing technology, market and market value. This is followed by a brief discussion of the challenges that these enterprises are facing. We also outline the linkages of the SMFEs and provide a brief account of the selected medium enterprises: sawmilling, furniture industry, plywood, wooden handicraft, paper mills and non-timber forest products.

In Chapter 4, we present briefly the governance issues. There we list legal and policy documents that relate, directly or indirectly, to the small and medium forest enterprises sector in Nepal. Then, in Chapter 5, we present the diagnosis of the selected NTFPs and forest products: Kurilo, Chiraito, Jatamansi, Wintergreen, Lokta and Sissoo. For each of these products, we cover their biological features, resource management, uses, marketing and finance, socio-economic and policy issues, as well as the opportunities and threats.

## **OVERVIEW OF SMFEs IN NEPAL**

Small and medium forest enterprises (SMFEs) as well as micro-enterprises have been instrumental in providing rural Nepalese with a livelihood. However, the poor quality of local products has reduced their competitiveness and hampered the ability of rural people to sell their goods beyond local markets. A large number of these enterprises are informal and unregulated, and therefore are unable to take the opportunities available through linkages to proper marketing channels. They are also constrained by a lack of value addition, technology and product supply capacity, as well as by the absence of a supportive policy and legal framework.

At present there are two types of micro-enterprises: formal and informal. Informal enterprises are generally initiated by an individual family to earn money by means of their traditional craft skills, whereas formal enterprises are either initiated by NGOs and government agencies as income generating programs for poor families and the marginalized, or self-initiated by the rural people themselves. Formal enterprises are often supported by training and the allocation of funds. Often, however, business counselling and market linkages are not considered and environment-impact considerations are neglected. Since micro-enterprises are very small and family-based, they are generally operated from home. This can have an adverse impact on the home environment, depending on the enterprise (e.g. poultry raising, wool carding, chemical dyeing, welding, furniture repairing). Since this impact is originated at home, it is rarely documented. Despite these limitations, micro-enterprises tend to be more profitable entities because of the non-valuation of family labour and reduced overhead.

In underdeveloped countries like Nepal, micro-enterprises are one of the most viable options to create employment opportunities and consequently to reduce poverty.



Moreover, since Nepalese society is characterized by social exclusion, the development of such enterprises can provide employment to a relatively wider section of Nepal's population, thereby narrowing down income disparities.

A large number of small enterprises are situated in the informal sector. These enterprises are not regulated under the various industrial acts of Nepal, although they are generating significant income and local employment and are often ignored by the government, e.g. in providing support. Future interventions will require detailed assessments of this sector. A study on the small-scale, informal, forestry sector enterprises in the Banke, Bajhang, Humla and Dolakha districts undertaken by ANSAB showed that a significant proportion of the non-wood and wood-based enterprises were in the informal sector and it was unlikely that their contribution was reflected in the official statistics. The study also found that the majority of forest-based enterprises in Dolakha, Bajhang and Humla (hills and Himalaya region) were operated informally by CFUGs. Only a few were wood-based enterprises such as timber depots and small furniture enterprises. Instead, other enterprises such as community goat keeping, NTFP collection and processing, bee keeping, community based milk production, Allo and nettle processing, and bio-briquette production were more abundant. These enterprises were commonly found in small villages, operated locally, and contributed significantly to rural employment and livelihood generation.

In the Banke district (Terai), wood-based enterprises such as private sawmills, veneer producing plants, resin processing plants, timber and fuel wood depots, and NTFP wholesaling firms are run by private entrepreneurs. Some CFUGs are involved in community cultivation of medicinal and aromatic plants. They have established community distillation units which are registered by the District Cottage Industry. In addition, community and private cultivation of medicinal and aromatic plants such as Kurilo, Tulsi, Citronella, chamomile, and palmarosa are cultivated on community forest lease land.

## CURRENT STATUS OF SMFES

Small and medium enterprises constitute a major source of income in the rural and urban areas of Nepal. Specifically in Nepal's context, micro-enterprises are equally important. The term micro-enterprise is generally considered to be a very small enterprise with an average investment of NR 20 000 (US\$322) and annual revenues of approximately NR 250 000 (US\$4 032) (Nepal, 2004). Specific government policies target formal sector cottage and small industries (CSI). The Industrial Enterprises Act of 1992 classified cottage industries as traditional industries that utilize specific skills and local raw materials, are labour intensive, and are related to national traditions, art and culture. Industries with a fixed capital investment of up to ten million Nepalese rupees are classified as small industries. Enterprises with a fixed capital investment of between 10 and 50 million Nepalese rupees are classified as medium-sized, and those with a fixed capital investment of more than 50 million Nepalese rupees are categorized as large industries. According to the Department of Industry, during the period from 1993/94 to 1995/96, registered industries with an average of 12 employees accounted for 27 658 (of which 4 678 were cottage industries and 22 980 were small-scale industries), compared to only 731 medium and large industries with an average of 99 employees.

Community-based forest enterprises (CBFEs) exist in various modalities, which can be described according to geographic isolation, eco-region, ownership and management structure, product types, linkages to sources of raw materials (e.g. wild crafted vs cultivated), technological development, target markets, and seasonality of operations (Subedi *et al.* 2002).

In Table 1, we present forest based enterprises and their sales status in two study districts where ANSAB recently completed a project entitled *Advancing Community Forestry for Sustainable Enterprises in Nepal*. The project supported the development of community forest-based enterprises, NTFP products and markets.

**Table 1. List of forest-based enterprises and their sales in 2006 (Dolakha and Bajhang district)**

	Enterprise	District	Enterprise Type	Products	Economic Participants			Total Sales (NR)
					HH	Male	Female	
<b>A. Network Enterprises</b>								
1	Bhimeshwor Forest Products Processing Pvt. Ltd	Dolakha	CFUG-Cooperative	Handmade Paper	2 472	6 614	6 638	385 000
2	Everest Gateway Herbs Pvt. Ltd.	Dolakha	CFUG-Cooperative	Handmade Paper	1 506	4 333	4 241	1 813 000
3	Shree HERBIL Co-operative	Bajhang	Cooperative	NTFP and agriculture	1 749	7 038	6 784	47 927
4	Masta Rilū Allo Enterprise	Bajhang	CFUG-Cooperative	Allo product	748	2 712	3 214	59 000
<b>Total</b>					6 475	20 697	20 877	2 304 927
<b>B. Value Added Enterprises</b>								
1	Deudhunga Multipurpose Cooperative Ltd.	Dolakha	Cooperative	Essential Oils	25	25	0	303 200
2	Panditkamala Forest Products Processing Pvt. Ltd.	Dolakha	CFUG-Value addition	Handmade Paper	120	360	300	0
3	Hastakala Furniture Enterprise	Dolakha	Private	Furniture	1	1	1	156 400
4	Ubak Furniture Enterprise	Dolakha	Private	Furniture	1	1	2	98 700
5	Kalinchock Furniture Enterprise	Dolakha	Private	Furniture	1	1	1	27 550
6	Malika Handmade Paper Enterprise	Bajhang	CFUG-Cooperative	Handmade Paper	240	767	786	260 000
7	Himali Handmade Paper Enterprise	Bajhang	Private	Handmade Paper	3	6	6	348 400
8	Kailash Allo Processing Enterprise	Bajhang	CFUG-Value addition	Allo fiber	2	6	3	40 000
9	Masta Dhatelo Processing Enterprise	Bajhang	CFUG-Value addition	Dhatelo oil	155	1 471	1 398	0
10	Gorkhali Dhatelo Processing Enterprise	Bajhang	CFUG-Value addition	Dhatelo oil	87	337	331	0
<b>Total</b>					635	2 975	2 828	1 234 250
<b>C. Production and Trade Enterprises</b>								
1	Community timber depot, Bhitteipakha CFUG	Dolakha	CFUG enterprise	Timber	237	656	642	381 856
2	Community fuel wood and timber depot, Suspa CFUG	Dolakha	CFUG enterprise	Fuelwood, Timber	303	769	833	213 693
3	Community timber depot, Dhandesingdevi CFUG	Dolakha	CFUG enterprise	Timber	311	633	655	310 875
4	Community timber depot, Boldesetidevi CFUG	Dolakha	CFUG enterprise	Timber	225	570	585	152 400
5	Community fuel wood depot, Jiri	Dolakha	CFUG enterprise	Fuelwood	472	1 170	1 203	137 080
6	Kailash timber and fuel wood depot	Bajhang	CFUG enterprise	Timber	240	767	787	15 000
7	Ranada timber depot	Bajhang	CFUG enterprise	Timber	214	638	632	37 500
8	Pariban timber depot	Bajhang	CFUG enterprise	Timber	155	471	398	0

	Enterprise	District	Enterprise Type	Products	Economic Participants			Total Sales (NR)
					HH	Male	Female	
9	Thagunna timber depot	Bajhang	CFUG enterprise	Timber	81	270	262	0
10	Community NTFP Trading, Ranada	Bajhang	CFUG enterprise	Raw NTFPs	214	638	632	0
11	Community NTFP Trading, Lahare	Bajhang	CFUG enterprise	Raw NTFPs	65	184	200	0
12	Community NTFP Trading, Kailash	Bajhang	CFUG enterprise	Raw NTFPs	240	767	787	0
13	Community NTFP Trading, Binayak	Bajhang	CFUG enterprise	Raw NTFPs	87	337	331	0
<b>Total</b>					2 753	7 861	7 858	1 248 404
<b>Grand Total (HH and population duplication removed)</b>					7 527	25 131	25 249	4 787 581

Box I below presents an outline of small and medium forest enterprises in three districts of Nepal, which are classified according to their geographical location.

### Box I. Small and medium forest-based enterprises in different districts of Nepal

#### Dolakha (a hill district)

1. Lokta (*Daphne* spp.) handmade paper
2. Allo (*Girardinia diversifolia*) processing enterprises and weaving
3. Wintergreen distillation enterprises
4. Community forest-based local wood depot
5. NTFPs collection and sales
6. Khoto collection and sales
7. Bamboo work
8. Furniture
9. Bio-briquettes
10. Bael Juice
11. Water mill
12. Incense

#### Humla (a trans-Himalayan district)

1. Essential oil distillation
2. NTFPs collection and sales (e.g. *Cordyceps sinensis*)
3. Group marketing of NTFPs
4. Dhatelo (*Prinsepia utilis*) oil extraction
5. Royalty collection from NTFPs sales
6. NTFP trading cooperatives
7. Small scale furniture
8. Sheep farming and goat keeping

#### Banke (a Terai district)

1. Local manufacture of Katha ( an ingredient of paan (betel leaf)
2. Manufacture of gums and resins
3. Cottage match industry
4. Incense enterprises, rattan cane work
5. Manufacture of paper cups, plates, bags, and other paper containers
6. Sal paper plate production enterprises
7. Medicinal and aromatic plant cultivation on community forestry lease and fallow land, aromatic plant distillation
8. Plywood industries
9. Sawmills
10. Furniture
11. Mat and basket making enterprises
12. Rope making enterprises
13. Manufacture of paper cups, plates, bags, and other paper containers
14. Resin processing

## TYPES OF OWNERSHIP AND MANAGEMENT STRUCTURE

In Nepal, there are four legal options available for enterprise registration: sole proprietorship (only one shareholder), private limited (1–50 shareholders), public limited (at least 51 shareholders) and cooperative (at least 25 members). Three different legislations govern these registration options. The Private Firm Registration Act 2014 BS (1957) governs sole proprietorship firms, while the Companies Act 2053 BS (1997) addresses the registration process for private limited and public limited companies, and the Cooperative Act 2048 BS (1992) is related to cooperative registration and operations.

A sole proprietorship firm is registered with the Department of Cottage and Small-Scale Industry (DCSI). The registration process is simple and uses a standard format. A firm does not need to produce its balance sheet for purposes of tax assessment and clearance. However, the firm cannot issue shares or debentures, and the owner's liability is unlimited. The firm is subject to income tax and value added tax, depending on revenues.

As per the Companies Act, a minimum of one and a maximum of 50 shareholders can register a private limited company, while seven shareholders, at the time of incorporation, can register a public limited company, although the number of shareholders should exceed 51. The Office of the Company Registrar registers the companies incorporated under the Companies Act. For the registration of the company, shareholders must produce a Memorandum of Understanding (MoU) and an Article of Association (AA) during the incorporation process. It can issue and allocate different types of shares (preference, ordinary and bonus) and debentures, and the liability of the shareholder is limited. Similarly, provisions for converting private limited into public limited (and vice-versa), are clearly stipulated in the Act. The company is subject to income tax and value-added tax, depending on their revenues, and needs to produce an audited balance sheet for purposes of tax assessment and clearance. In addition, any enterprise that intends to undertake trading as part of its business needs to register with the Department of Commerce.

A minimum of 25 members can register their enterprise as a cooperative. A cooperative can issue and allocate shares and debentures. It is also authorized to operate limited banking transactions, including savings and borrowing schemes, for their members. However, authorization from the Nepal Rastra Bank (the central bank of Nepal) is required. Cooperatives can distribute net profits to its members after retaining one quarter of the profit. However, dividend amounts cannot exceed 15 percent of the paid-up capital per share. A cooperative is exempted from local taxes (i.e. full or partial waiver on the import of agricultural machinery, industrial plants, raw materials, and office supplies).

In addition to the four enterprise options outlined above, there are also other forms of enterprises that often operate informally. Below we present seven types of enterprises operating both within and outside the aforementioned legal options.

### **Individual or family enterprises**

The enterprises primarily owned and managed, with or without formal registration, by an individual or a family fall into this category. Many of the household-based enterprises are limited to the collection and sale of NTFPs from community or national forests. Examples include the production of handicrafts using traditional skills, and in a few cases, small scale, value added, processing enterprises, such as handmade papermaking.

### **Community-based organization (CBO) enterprises**

These enterprises include community forest user groups (CFUGs), National Park buffer zone management groups, forestry leasehold groups, and community groups with forest management or access rights. They are engaged in an economic activity which is allowed by a legal provision within their statutes or local codes. As they expand, they can consider getting registered, either as a cooperative or as a private company. Malika Handmade Paper is an example of an innovative approach that meets local needs and is legally compliant. There is a private company that is registered as a CFUG (Kailas Pimidanda). Through an internal arrangement, the company has distributed all its shares among the CFUG's 235 member households on the basis of their contribution (mostly in the form of labour). Individual collectors, who are also shareholders, receive annual dividends. Box 2 below provides an example of timber and firewood depots operated as forest enterprises in two districts.

## Box 2. Timber and firewood depots are a promising SMFE model in Dolakha and Bajhang Districts

One of the major causes of unsustainable harvesting of timber in the Dolakha district was due to the harvesting practices of contractors who purchased timber rights from CFUGs and harvested within community forests. The breaching of legally binding contracts resulted in excessive and indiscriminate harvesting, as well as in the harvesting of immature trees. Contractors and labourers were drawn frequently from outside the community, and were little concerned with the negative impact of their activities. In addition, profits and wages were not retained within the village. ANSAB worked with CFUGs to resolve this problem by developing timber and firewood depots to manage the production, distribution and sales of forest products from the community forests.

A timber depot committee, selected by the CFUG, manages the harvesting and marketing of timber from the community forest. The committee appoints a manager to coordinate all activities and provide daily supervision of the business. ANSAB provided support to develop business plans, enhance enterprise capacity and provide technical assistance to operate the business.

Before the timber depots were initiated, the CFUGs first determined the local market demand and identified the timber supply capacity of the CFUG. They also proceeded to make amendments to the operational plan with a view to incorporate anew the timber harvesting practices, the development of plans for the milling operations and the strategy for selling products in villages and local markets. Among the CFUGs successfully facilitated for depot enterprises were: Bhitripakha, Boldesetidevi, Dhandesinghdevi and Suspa CFUG in Dolakha. Similar enterprises were initiated by Shree Binayak, Ranada, Pariban and Thagunna CFUGs in the Bajhang district of Far-Western Nepal. Timber enterprises in Dolakha and Bajhang, during 2005-2006, managed harvesting and milling operations and sold 8906 cubic ft of timber, worth NR 953 956, with the involvement of more than 200 individuals. Similarly, two community firewood depots have been developed at Jiri and Suspa VDCs in Dolakha. Timber and firewood depots have shown a significant impact on sustainable harvesting of timber and firewood from community forests. ANSAB has received numerous requests from CFUGs for technical assistance to develop similar timber and firewood depots.

### CFUG network

A CFUG network enterprise includes two or more CFUGs working together for the collective production and marketing of forest products. CFUG networks have been using locally established institutions in order to introduce capital intensive technology and improve products, as well as to achieve economies of scale in production and marketing. Once the CFUG members agree to work together for a processing or marketing enterprise, the CFUG network has the choice to register as a cooperative or as a private company. The specific requirements corresponding to these options were discussed earlier in this report and the key difference between them is presented in Box 3 below.

### CFUG/individual networks

In CFUG/individual network enterprises a number of community-based organizations, such as CFUGs, associate with individuals and become the shareholders. The majority of NTFP enterprises of this type are operating as private limited companies, but they can also operate as a cooperative. This relationship has advantages since CFUGs are becoming an important source for the sustainable supply of NTFPs, and professional entrepreneurs can supply the management skills that are required in the partnership. Association among such groups and individuals can consolidate product supply, improve selling prices and help in product development and marketing.

### Box 3. Private limited companies vs cooperatives

There are some differences between private limited companies and cooperatives. Shareholders can still receive benefits from a cooperative, but it is not required to maintain a savings fund unless the company and shareholders decide to establish one. Also, the board of representatives can be selected in order to ensure equity and participation of all stakeholders.

The challenge for shareholding companies is that the most disadvantaged may not be able to afford shares, and influential members who own the majority of shares and have the greatest capital risk may exert control over the decision-making. In a private limited company, there is no guaranteed dividend. However, a co-operative is required to set aside profits for this purpose.

A private limited company can be established with up to 50 shareholders, but a cooperative requires at least 25 members.

### Network of individuals

There are various options to register an enterprise when more than one individual is involved. If the enterprise has a few members working closely under the leadership of one individual, then a sole proprietorship company can be registered. In order to provide individuals with greater control, the enterprise can be registered as a private limited company or as a cooperative. The main advantages of a network such as a cooperative is to obtain financing, provide savings and credit services, support marketing functions (access to information and bargaining with buyers), provide technological inputs and broker products on behalf of members.

### Government parastatals

This category includes companies with all shares or the majority of them owned and controlled by the government. Herbs Production and Processing Co. Ltd. (HPPCL), Rosin and Turpentine Company and Timber Corporation of Nepal are examples. They also have the option to register either as private limited or as public limited companies.

### Promoters and public shareholders

All the companies established by private investors such as Dabur Nepal, Bhaktapur Craft Printer (BCP), Nepal Paper Products (NPP) are registered as private limited companies. There are no public enterprises in this sector with public shareholders. This indicates that the NTFPs subsector lacks the viability to attract public investment or that the promoters are unwilling to issue shares to the wider public.

## RAW MATERIALS AND THEIR SOURCES

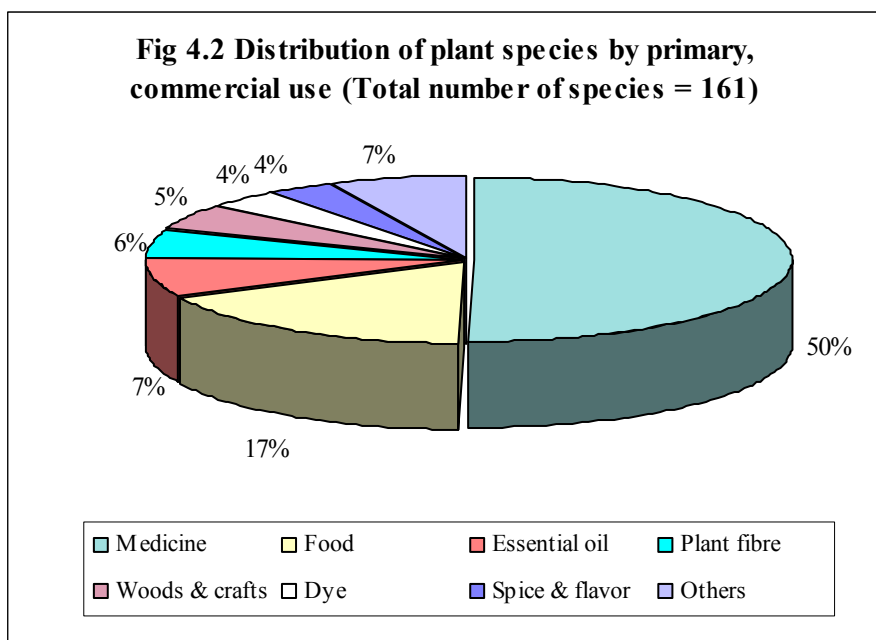
Subedi (2006) identified 161 species that are a source of commercial NTFPs in Nepal. Many of the species are used for more than one purpose. The Figure below shows the distribution of the plant species by primary use category. Over 50 percent of the plants are used primarily for medicinal purpose, which is followed by those for food (17%), essential oil (7%), plant fiber (6%) woods and crafts (5%),



spice and flavour (4%), and dye (4%). The remaining seven percent are mostly used for tonic, gum and resin, edible oil, broom, incense, and soap making.

Most of the enterprises were involved in trade of dried, unprocessed products, such as medicinal and aromatic products, mushrooms and health foods, as well as species and flavours. Some were involved in value-added processing such as essential oils, plant fibers, handmade papers, edible oils, gums and resins, and herbal dyes. A few produced final consumer products such as Ayurvedic preparations, handmade paper, wild fiber cloths, personal care products, herbal teas and handicrafts.

**Figure 1. Distribution of plant species by primary, commercial use (total number of species: 161)**



**Table 2. Types of products produced by community enterprises using NTFPs in Nepal**

Products	Examples of Plant Species Used
<b>A. Raw Plant Products</b>	
Medicinal and aromatic	Kutki, Chiraito, Louth sallo, yarshagumba, panchaunle, pakhanved, harro, barro, amala, neem, silajit
Spices and flavours	Cinnamon, timur, amala, juniper, large cardamom
Wild mushrooms and health foods	Morels, kurilo
Dyes and tans	Padamchal, chutro, majitho, louthsallo, banjh, thingre sallo, okhar
Plant fibres	Lokta, allo, argeli, hemp, bhimal, ketuke
Gums and resins	Chir pine, blue pine, sal
Handicrafts (leaves, woods, sticks)	Sal, pipal, bhorla, firfire, bamboo, nigalo, rattan
<b>B. Products after value-added processing</b>	
Lokta Handmade paper	Lokta
Argeli whiteskin	Argeli
Other plant fibers (threads, ropes, fabric)	Allo, hemp, bhimal, bhorla, argeli, sabai grass, ketuke
Fats and oils	Chiuri
Essential oils and extracts	Jatamansi, sugandhawal, titepati, sunpati, juniper, wintergreen, sugandhakokila, abies, deodar, lauth salla
<b>C. Finished Products</b>	
Ayurvedic preparations (medicines, tonic, nutrient supplements)	Kutki, chiraito, lauth sallo, yarshagumba, panchaunle, pakhanved, harro, barro, amala, neem, silajit
Traditional medicines	Kutki, chiraito, louth sallo, yarshagumba, panchaunle, pakhanved, harro, barro, amala, neem, silajit
Handmade paper products	Lokta, argeli
Wild fiber cloth	Allo, hemp
Incense	Jatamansi, juniper, sunpati, mahuwa
Herbal teas	Thyme, gurjo, gandhaino, tulsi, mint, cinnamon
Herbal drinks, juices	Bel, rhododendron, seabuckthorn
Brooms (amriso, sabai grass)	Amriso, sabai grass
Bamboo and rattan products	Bamboo, nigalo, rattan
Wood handicrafts (Phuru)	Firfire
Leaf products (sal leaf plates, handicrafts)	Sal, pipal, bhorla
Edible fats and oils	Dhatelo, chiuri, khamu, walnut
Rosin, turpentine and gums	Chirpine, blue pine, sal
Personal care products (soaps, shampoo, creams)	Pangar, chiuri, ritha, amala, sikakai, naru

Source: Subedi, 2006

Most of the commercially important NTFPs come from wild collections. These NTFPs are mostly collected from government controlled forests and meadows, including national parks and conservation areas. The exceptions are those which are harvested from community forests and private land. Since in most cases, including in community forests, the use and management of provisions are not included in the relevant management plans, these resources are governed under an 'open-access' system. In

addition, although not intending to protect NTFPs, indigenous protection systems are in place in some areas. It is also apparent that species cultivated on private lands are better managed than the same species on public lands, indicating that management skills and knowledge do exist and that tenure is an important investment consideration.

## EMPLOYMENT STATISTICS

Although the SMFEs sector has made a significant contribution to both formal and informal employment, this has not been verified to date. The following table shows the employment rates in Nepal by various categories.

**Table 3. Employment situation in Nepal**

Status	Male	Female	Total	Status %	Female %
Employer	216 312	160 038	376 350	3.8	42.5
Employee	1 890 586	547 743	2 438 329	24.6	22.5
Self-employed	3 178 384	3 032 456	6 210 840	62.7	48.8
Unpaid	321 493	553 186	874 679	8.8	63.2
<b>Total</b>	<b>5 606 775</b>	<b>4 293 423</b>	<b>9 900 198</b>	<b>100.0</b>	<b>43.4</b>
<b>Percent</b>	<b>56.6</b>	<b>43.4</b>	<b>100</b>		

Source: Compiled from Population Census 2001, CBS. (ILO Nepal, the Informal Economy & Workers in Nepal, Series I, 2004)

Among employed workers, 3.8 percent are employers, nearly one-fourth is employees, 62.7 percent are self-employed, and the remaining 8.8 percent are unpaid family workers. The share of female workers is high in the unpaid category (63.2%). What is also notable is the high proportion of women who are self-employed, though this does not mean that the women in this category are entrepreneurs. They are actually unpaid family workers.

## GEOGRAPHIC DISTRIBUTION

Geographically forest-based enterprises cover all three major ecological zones (Terai, Hills and Mountains) and all three regions (East, Central and Western regions). However, the production of NTFPs is a more important activity in the mountains and hills. Although the availability of tradable raw materials is the necessary condition for an enterprise, we found that it did not automatically lead to the creation of an enterprise. Knowledge, technology and market demand were found to be the primary driving forces for the establishment of a new enterprise (ANSAB 2003). Depending on the availability of raw materials, enterprises develop first in areas that are accessible to market centres. For example, handmade paper enterprises were initially concentrated in Dolakha, Parbat,

Kaski, and Baglung, but now have expanded to more remote locations such as the Bajhang and Bajura districts.

## **SEASONALITY OF OPERATION**

The current practice of NTFP collection involves only harvesting during periods that are convenient to the collectors. This often does not coincide with the biological maturity of the species. For example, *Swertia chirayita* propagates only from seed which is mature during October–November. Due to high demand and monetary considerations, collectors usually harvest this plant during July–August, before its biological maturity so that they can secure money for Dashain, the main festival for most Nepalese. Enterprises also differ in terms of seasonality of operation. Those that collect NTFPs and sell them unprocessed to traders have a limited season of operation, confined mostly to a few winter months. Papermaking is generally done during the summer or on sunny days, provided there is sufficient raw material.

## **PROCESSING TECHNOLOGY**

Many enterprises use simple and locally available technologies. For value-added processing, a range of technologies are employed for activities such as drying, grading, packaging, distillation of essential oils, debarking, papermaking, rope-making and stitching (Table 4).

Although a wide range of Ayurvedic preparations are produced in Nepal, only a small overall percentage of NTFPs are processed in the country by industries into products such as resins, turpentine, kattha, paper and essential oils, or by cottage industries using fibers and wood materials. Most of these were established only recently. Weaving of Allo (*Girardinia diversifolia*) and hemp (*Cannabis sativa*) occurs, as well as other fibers, but the market provides low remuneration. The weaving of bamboo and *nigalo* (*Arundinaria falcata*) for baskets, mats and other goods for daily, seasonal and ceremonial use is common in the hills and plains. Other small-scale cottage industries produce handmade paper, herbal teas, juices from wild fruits and flowers, cold creams, soap and shampoo, herbal dyes, honey, incense, chiuri (*Aesandra butyracea*), butter and Bhutun (a sour juice concentrate from *Pyrus pashia*).

**Table 4. Value added technologies used by CBFEs**

Technology	Examples of Applications
Drying: mainly traditional sun and fire drying, but some practices use a solar dryer, hybrid solar dryer and solar cooker	All medicinal and aromatic products except wintergreen; mushrooms including morels; spices.
Distillation: a range of steam distillation	Essential oils from wintergreen, Jatamansi, sugandhwai, zanthoxylum, anthopogon, seabuckthorn
Solvent extraction	Fixed oils and fats from cinnamon, caster, jatropa, sugandhkokila as well as harro, barro for leather tanning
Extraction of active ingredients	<i>Taxus, Podophylum</i>
Sapogenin extraction	Ritha and other soap bearing plants
Extraction of juice	seabuckthorn, bael, rhododendron
Grinding (grain mill), mixing	Herbal teas, Ayurvedic medicines
Debarking	Argeli
Paper-making (handmade)	Argeli and Lokta
Detoxification	Removal of saponin from chiuri ghee
Oil expeller: various types	Dhatelo oil, chiuri, jatropa
Fiber extraction	Ketuke
Rope maker: pedal operated	Babiyo
Weaving: shuttle loom (instead of backstrap loom) and pedal operated spinning (Charkha)	Allo cloth
Compacting: pressing to reduce volume	Chiraito
Packaging: bulk	All raw NTFPs, value added products and finished products
Leaf plate stitching, pressing and drying	Sal leaf, bhorla
Soap making	Ritha, pangar, chiuri butter

Through technological advancements, there is potential to improve quality, reduce losses, and increase the efficiency of operations. Technological improvement can also build on traditional and existing technologies in order to meet market demand.

## MARKET AND MARKET VALUE

Global markets for Nepal's NTFPs are expanding as consumers are increasingly attracted to natural products. The custom records and information from the Trade Promotion Center (TPC) show that Nepal's NTFPs are exported to over 30 countries in Asia, Europe and America. These include India, Pakistan, Hong Kong, Singapore, Japan, South Korea, UAE as well as France, Germany, Italy, Sweden, Switzerland, the Netherlands, the United Kingdom, the United States and Canada.

Although many Nepali enterprises target domestic markets, high value and low volume products, such as essential oils, and specialty natural products such as Lokta handmade paper, have their markets outside the country. The bulk of NTFPs are exported, mostly to India, in raw form, making Nepal the leading supplier of medicinal plants to the Indian subcontinent. Several processors and manufacturers (such as HPPCL, Singha Durbar

Vaidyakhana, Dabur Nepal, NPP, and Gorkha Ayurved Company) produce a variety of products and market them both nationally and internationally.

NTFPs harvested for commercial use are transported from villages and are sold to traders and middlemen in bigger markets like Nepalgunj. Local collectors take products from forest and pastures to village-level traders and/or district-level traders who stockpile the products and resell them to wholesalers in the Terai. Wholesalers often demand specific products from local/district traders, or travel to local areas to directly arrange for the purchase of products. The Terai wholesalers then supply the unprocessed products to Indian buyers who most often work as commission agents.

The main demand for medicinal plants comes from big Indian companies and pharmaceutical enterprises. These firms generally buy from Nepali or Indian traders or middlemen. Indian wholesalers occasionally come to trading towns and road heads inside Nepal, which are the major collection points in the hills. They have agreements with shopkeepers who are in contact with a network of village-based traders and collectors throughout the less accessible parts of Nepal. Several NTFP wholesalers are also based in Kathmandu and use the same network of middlemen to buy the products.

In international markets, many of Nepal's NTFPs, except fiber and handicraft products, are traded under the "Herbs and Spices" category. Very few dealers and brokers deal exclusively with medicinal herbs. In recent years, direct trade between producers/exporters in developing countries (mainly medium and large scale) and processors in consuming countries has increased.

Of the 161 NTFP species that are commercially traded from Nepal, only a few products are exported with value-added processing, and most of this is limited to cleaning, drying and, in very few cases, grading. The total value of these products, based on the selling price at two major cities of Nepal (Nepalgunj and Kathmandu), is estimated to be about NR 2.5 billion (equivalent to nearly US\$35 million) every year (Table 5). Of these NTFPs, some notable products found in the hills and mountains include Yarshagumba (*Cordyceps sinensis*, an Ascomycete fungus, grown on the head of a moth larva), dried morels (*Morchella* spp., another Ascomycete), handmade paper and products from Lokta (*Daphne* spp), *Dactylorhiza hatagirea*, *Podophyllum hexandrum*, *Taxus* leaves, Chiraito (*Swertia chirayita*), timur (*Zanthoxylum armatum*), Jatamansi (*Nardostachys grandiflora*), sugandhwal (*Valeriana jatamansi*), atis (*Delphinium himalayai*), dhupi (*Juniperus indica*) and kutki (*Neopicrorhiza scrophulariiflora*).

**Table 5. Export quantity and value of Nepal's major NTFPs in 2001/2002**

Products	Value in '000 NR	Percentage	Volume, MT
NTFPs in crude form ( 43 major species)	892 519	35	5009
Large cardamom	1 160 000	46	5800
Lokta handmade papers and its products	275 375	11	-
Pine resin	108 000	4	6000
Essential oils	50 559	2	23
Allo and hemp products	43 675	2	-
Incense	16 503	1	-
Total	2 546 631	100	

Source: (ANSAB, 2004)

There was generally a lower level of consumer interest in natural products during the period from the late 1960s to the early 1980s due to the possibilities created by biotechnology and synthetic drugs. By the mid-1980s, however, the interest in natural products increased due mainly to the growing concern for personal health, and the recognition that technology alone was incapable of addressing the health needs of the world's population (Tempesta and King 1994). It is estimated that the value of the most economically important NTFPs in world trade totals about US\$11 billion annually (Iqbal 1995). The WHO (2002) estimated that the global sales of herbal products totalled US\$60 billion in 2000, and this amount was estimated to grow to US\$5 trillion by 2050.

## CHALLENGES FOR ENTERPRISES

Based on a field study and a literature review, it was found that there were barriers and challenges in marketing of forest products (especially the NTFPs), which can be grouped into the following categories:

- imperfect wholesale markets for NTFPs created by the following conditions: a) a limited number of wholesalers, b) controlled price information, and c) the government is the major buyer for some products;
- little developed markets for many products and high price fluctuations;
- many producers with small quantities of products receive only a small portion of the total revenue;
- the advantages and disadvantages of brokers and middlemen (exploitation by middlemen versus services provided, such as cash advances, transport, storage, risk-taking);
- lack of market information such as product prices and available volumes, and projections of future supply and demand;
- lack of marketing knowledge and skills amongst traders;
- limited access to information and technology for product development;

- lack of marketing infrastructure (e.g. storage, transportation, quality testing laboratory facilities);
- lack of branding, certification and recognized standards for Nepali products to ensure that products are produced organically, traded fairly, and environmentally sustainable;
- difficulties in meeting market requirements due to uncertainties such as production fluctuation, collection uncertainty (weather), and inconsistent grading and quality control;
- inherent quality limitations with regard to collection and trading (e.g. the inability to identify NTFPs species during collection and lack of concern by Indian consumers for quality negates premium for high quality products).

Subedi (2006) identified a list of challenges, as perceived by entrepreneurs. It is important to note that entrepreneurs represent the established traders or businessmen who are also doing NTFPs business.

**Table 6. Challenges perceived by NTFPs entrepreneurs in 1995 and 2002 in Nepal**

Challenges	Frequency (%)	
	1995	2002
Regulatory hassles in transport, sale and export – both formal and informal	58.6	51.4
Impractical government bans and restrictions	52.3	49.3
Illogical royalty rates and multiple taxation	49.6	60.6
Lack of clear and specified policy and regulation on NTFPs collection, transport and sale	46.0	87.3
Sustainable supply of products – no programmes on conservation of sustainable production of NTFPs	15.3	45.8
Lack of or difficult access to finance	5.4	0.7
Lack of business development services	3.6	4.2
Lack of marketing information	2.7	4.2
No organized market and difficulty to access markets	1.8	3.5
Lack of infrastructure (transportation, storage)	0.9	2.1

Source: Subedi, 2006

The lack of a clear and specific policy was a serious challenge perceived by entrepreneurs since the frequency increased dramatically from 1995 to 2002. Regulatory difficulties were a challenge for the majority in both years since there were impractical government bans and restrictions, illogical royalty rates and multiple taxations, as well as a lack of clear and specified policy provisions in relation to collection, transport and sale. Many of the traders complained that the government's policies in regulating NTFPs were not realistic considering the current trend in business. They also complained that the government was not giving sufficient support to enterprises and trade. Only 15 percent recognized the problem of sustainable supply in 1995, although this rose to 46 percent in 2002. This may be due to increased awareness by traders of the threat posed by the lack of raw



materials. Access to finance, business development services, markets, marketing information and infrastructure were not rated as problems for most entrepreneurs in either year. The need for business development services is still underestimated and there was little recognition of the challenge posed by technology.

## **LINKS TO OTHER FOREST ENTERPRISES**

Enterprise links and associations play an important role for the sustainable production, management, market research, trade and development of small and medium forest enterprises (SMFEs). The project shall explore the possibilities of linking up its activities with existing organizations that provide or use services at local or regional level, such as those involved in providing technological and marketing information. Linkages can also be developed with the FECOFUN and Department of Forest. It could also be linked-up with related Chambers of Commerce and Industries and Traders' Associations.

The following institutions/stakeholders are involved in the sustainable production, collection, processing and other activities regarding NTFPs/Forest-based products in Nepal:

- ANSAB, Kathmandu
- Bhaktapur Craft Printers (BCP)
- Nepal Paper Products (NPP)
- Association of Craft Printers (ACP)
- Malika Handmade Paper Private Limited, Bajhang
- Lokta Handmade Paper Producers, Naglibang, parbat
- Department of Domestic and Small Scale Industry
- BDS MaPS, Kathmandu
- Department of Plant Resources, Kathmandu
- Department of Forest, Kathmandu
- National Trust for Nature Conservation/Annapurna Conservation Area Project, Pokhara
- District Forest Offices
- FECOFUN, Kathmandu
- JABAN, Nepalgunj, Banke

## **ACCESS TO FINANCE**

In Nepal, apart from some government initiatives with a microcredit component (normally granting loans without collateral), micro-finance programs can be divided into four categories: Grameen Bank replications (five Grameen Bikas Bank, Nirdhan Uthan Bank and Centre for Self-Help Development), small farmers' cooperatives (101 exist at present), credit and savings cooperatives (over 1500) and NGOs operating as financial intermediaries (15 as of June 2001). In most cases, women are the target group because: women invest their resources in the household (food, health, shelter, children's education) more than men; women are better reaper than men; women in rural Nepal (ILO, 2005).

## SELECTED MEDIUM ENTERPRISES

The first mechanized wood-based industry, in the form of a match factory, was established in 1938 in Nepal. Successive five year plans that began in the mid 1950s have emphasized the need for the development of industries based on indigenous materials; the acceleration of industrial development and the contribution of forests to the country's economic, social and industrial development. However, wood-based industries have not advanced much because of a number of constraints.

Traditionally, rural people have depended on forests to supply timber, poles and fuel wood. In addition, forests have provided considerable opportunities for local employment and income based on a range of goods. Local craftsmen, small-scale artisans and cottage industries depend on forests for resources such as bamboo, rattan, beedi leave (*Diospyros melanoxylon*) and tannin materials. Rural people also draw upon the forest for food such as honey, tubers, fruits and leaves, and bush meat. The following discussion outlines a selected range of forest-based medium-sized enterprises in Nepal.

### Sawmilling

Industrial sawmilling in Nepal is done by private sawmills. All sawmills are technically similar, consisting of a horizontal band saw with a very simple carriage and a vertical band saw for re-sawing. Power is supplied by electricity or a diesel engine. Private sawmills are licensed without being given timber quotas and are dependent on parastatals (viz. Timber Corporation of Nepal) for their log supply, though many sawmills increasingly draw upon raw materials supply from private farms. The sawmilling industry supplies towns with lumber, where it is used for furniture, joinery, building and construction.

Based on the growth of urban population and assuming a constant per capita consumption rate, as well as ten percent demand by development projects, the projected demand for industrial sawn wood is shown in Table 7.

**Table 7. Demand for industrial sawn wood 1985- 2010**

Particular	1985	1990	1995	2000	2005	2010
Urban population, million	1.194	1.549	1.971	2.466	3.030	3.654
Consumption '000 m3 per capita	0.059	0.059	0.059	0.059	0.059	0.059
Sub total '000 m3/yr.	71	91	116	145	179	216
Development projects (10% above)	7	9	12	15	18	22
Total demand '000 m3/yr.	78	100	128	160	197	233
Corresponding log requirement, '000 m3/yr	166	213	272	340	419	506

*Adapted from MPFS (1988)*

The capacity of the present sawmilling industry is more than sufficient to meet lumber requirements to 2010. However, most of the mills will have to be renovated before that date. Many have to be relocated for better access to raw materials. Several CFUGs have been successfully running community-based wood depots and sawmills as promising new enterprises in the mid-hills and the Terai regions of Nepal.

## **Furniture industry**

Nepal's furniture industry includes modern factories, hundreds of small workshops and thousands of individual carpenters. To meet future demand, there is a need for additional modern factories, but these industries will have to secure raw materials from the parastatals, community forests as well as private farms. Existing factories are unable to operate at full capacity because of the lack of raw materials. Furniture has export potential since its value added nature can overcome the high transport cost. There are, however, problems associated with raw material supply, product quality, design suitability, and knowledge of export markets.

In rural and remote areas of Nepal, some community forests have initiated community furniture enterprises with the support of NGOs. These enterprises have fulfilled local demand for furniture and agricultural tools. There is a need, however, for support in research, capacity building for sustainable production and management, and marketing.

## **Plywood**

There are two plywood mills in Nepal with a total production capacity of 62 300 m<sup>2</sup>. Both mills have old machinery and are very labour intensive. Due to a shortage of raw materials, these mills are operating at about 52 percent capacity. There are no reliable data on plywood consumption in Nepal because there is an unrestricted and undocumented flow of products across the border with India. It is estimated that two-thirds of the local demand is fulfilled by imports from India. Therefore, there is sufficient demand to encourage the expansion of the plywood industry; however, increased demand for more plywood logs would put pressure on the forest resource. This needs to be addressed partly through plantations of suitable species in private or community lands.

## **Wooden handicraft**

Wooden handicrafts are produced throughout the country at the cottage industry level. Kathmandu valley is very famous for handicraft. At present, there are no estimates of the volume or value of craft production for the country as a whole. However, as an indicative estimate for the Kathmandu Valley, 4 300 m<sup>3</sup> of sawn wood is utilized by the handicraft industries, and the value of their production is estimated at US\$1 million (MPFS, 1988).

Although the required volume is not large, producers lack high quality wood on a regular basis. This problem is hampering the export potential of the industry.

## **Paper Mills**

At present, Nepal's paper mills use non-wood raw materials such as sabai grass (*Eulaliopsis binata*), straw, and waste paper. There are still no plans to shift to wood-based paper and build a pulp factory in Nepal. In order to be self-sufficient in printing and writing papers by 2010, Nepal will have to establish six new small mills (30 tonnes/day) or one or two large mills, with a total annual capacity of 60 000 tonnes. The size of the mills should preferably be larger to derive the benefits of economy of scale and to bear the cost of pollution control facilities (FAO, 2003).

Given the uncertain availability of raw materials at present, any new mills should be based on plantation grown wood. If 60 000 tonnes of paper were to be produced from fast growing, short rotation plantations, it is estimated that 30 000 ha may require reforestation.

## Non-timber forest products

Nepal's major non-timber forest products are medicinal and aromatic plants, Lokta paper, pine resin, kattha and sabai grass. Lokta is linked to a traditional cottage industry, while the others are linked to industries which add considerable value.

Medicinal and aromatic plants are important components of Nepal's vegetation. More than 700 species are documented, which accounts for 12 percent of Nepal's vascular flora. They are distributed throughout the country, with significant concentration in the higher altitudes.

Collection of medicinal and aromatic plants in the wild is an ongoing tradition in Nepal. Utilization continues to be for the preparation of drugs. The bulk of the harvest is exported, mostly to India, but lack of documentation has made it impossible to determine the exact amount. According to Edwards (1995), from 10 000 to 13 000 tonnes of medicinal and aromatic plants are harvested annually from the forests of Nepal. The value of this trade to Nepal's economy is estimated to be US\$8.6 million/year.

Herb Production and Processing Company Limited (HPPCL), a parastatal within the Ministry of Forests and Soil Conservation, is responsible for the production, processing, and export of medicinal and aromatic plants, crude drugs and extracts. In 1995/96, HPPCL sold US\$448 000 worth of processed products (HPPCL, 1997). It also conducts commercial scale experiments in agro-technology in its herbal farms. It has a number of herb purchasing centres in different parts of the country. In addition to HPPCL, the trading of crude drugs is being handled by private firms and individuals.

Lokta (*Daphne* sp.), which is a shrub found in upper temperate forests, has traditionally been used as the raw material for handmade paper production. It is the basis of a cottage industry that has estimated revenue of US\$4.2 million. Handmade paper is used for a variety of purposes, from legal documents to record keeping papers, religions scriptures, file folders, envelopes, and greeting cards. Handmade paper is also exported in small quantities. Special management plans for Lokta harvest have been prepared and implemented in Baglung, Parbat and Myagdi districts. Handmade paper production is a very important source of income for people living in the paper production areas.

Resin tapping of *Pinus roxburghii* has been going on for several decades. It has significant economic potential in providing raw materials for domestic use and for the resin and turpentine industry. One large resin processing plant is being operated by Nepal Resin and Turpentine Industry, a parastatal. Six small scale private industries are also operating. The bulk of the resin is tapped in the western and far western regions of the country. Table 8 shows past and current estimates of resin collection and prospects for future production.

**Table 8. Estimates of industrial production based on pine resin**

Particular	1988	1995	2000	2005	2010
Resin collection '000 tonnes	6	10	15	20	21.7
Resin production '000 tonnes	4.2	7	10.5	14.0	15.2
Turpentine production '000 tonnes	0.9	1.5	2.2	3.0	3.3

*Adopted from MPFS (1988).*

Kattha is an extract obtained from the heartwood of *Acacia catechu*. It is a light brown coloured crystalline substance used in the preparation of "paan", a chewing substance popular in South Asia. A by-product of kattha production is kutch, which is used in

tanning and dyeing. Nepal has six kattha factories with a total production of 650 tonnes of kattha and 700 tonnes of catch. Nearly all of the production is exported to India and other countries of South Asia. This industry is dependent on the availability of khair, a rapidly diminishing resource.

Sabai grass is a common wild grass which grows from 450 to 900 m in subtropical forest areas of Nepal. It is traditionally used in rope making and thatching. Along with straw, it is used as raw material in Nepal's paper mills. Sabai improves the value of paper significantly. Replanting becomes necessary when the grass yield starts to decrease as the root stock becomes exhausted.

## SMFES GOVERNANCE ISSUES: THE INFLUENCE AND EFFECTIVENESS OF POLICIES AND INSTITUTIONS

### GOVERNANCE ISSUES

Nepal's Tenth Five-Year Plan (2002–2007) recognizes the potential for a sustainable use of forest resources for poverty alleviation through the promotion of forest-based micro and small enterprises. Some 500 forest-based enterprises involving very poor and socially excluded families of community forests (CFs) were targeted in the Plan, and income generation programs were planned for 253 000 households in CFs and 25 680 households in leasehold forests (HMG, 2002). The community forestry policy, achievements in CFs and the quantitative targets set for enterprise development by the government indicate a favourable policy scenario for community-based forest management and enterprise development. However, government mechanisms and other development initiatives are tuned only to promote community-based conservation and the fulfilment of the communities' subsistence needs. Moreover, government institutions have cumbersome bureaucratic procedures. For example, the forest-based enterprise registration requires a three-party consensus (District Forest Office, Cottage and Small Industry Development Board and Land Survey Office) on feasibility and environmental impacts of proposed enterprises.

Although the policy set empowers CFUGs to independently manage, use and trade forest resources of their CFs, in practice trade on forest products is constrained by traditional authoritative and conservative forest officials who have a significant say in forest enterprise development, sourcing of raw materials from government-controlled forests and transportation of forest products. Furthermore, multiple taxations on forest-based products by various government bodies makes it difficult for many forest-based enterprises to operate profitably. This situation favours influential traders who can control the trade on forest products through their capacity and ties with authorities. Banks and financial institutions are almost nonexistent in rural areas. District cottage and small industries development offices, which are mandated to provide business development services, provide skill-development training courses only to a few individuals. Although there are some NGOs in the districts, their understanding and capacity related to enterprises is weak.

A significant percentage of Nepal's poor, especially those who live in high mountains, are engaged in collecting, trading and selling non-timber forest products (NTFPs) of social, cultural and economic value. Despite their untiring efforts, they have not been able to get fair returns from the ever-expanding trade of NTFPs. Local people, the primary producers, get only a small fraction of the value of end sales in international markets. The pattern of benefit distribution is highly inequitable. Likewise, in a NTFPs subsector analysis of the Kamali zone, regional traders (usually based in Nepalgunj) followed by airport traders (in the mountainous districts) generate the largest profit (Subedi, 1999). It was found that one village trader's profit is 58 times higher than that of a harvester (Subedi and Ojha, 2001). The same analysis showed that a road head trader earns more than what 1 000 harvesters or 17 village traders can earn. Likewise, a regional trader's profit is

4 307 times higher than that of a harvester, 73 times of a village trader or 4 times of road-head trader. In addition to benefit distribution, there are numerous policy and regulatory issues influencing SMFEs and NTFP-based trade in Nepal. These are briefly outlined in the following table.

**Table 9. Some policy and regulatory issues and their implications for SMFEs**

Policy Issues	Implications on SMFEs
Arbitrary royalty rates for NTFPs and absence of a well-developed system to determine royalties	Increased costs for final products
Lengthy and costly export formalities	Export discouraged
Ban on collection and trade of commercially valuable NTFPs that can be harvested on a non-destructive basis	Illegal trade continues; which allows elites to capture the business
Contradictions between forest acts and local governance acts regarding control over NTFP use and management	Excessive taxes by local as well as central government and increased costs
FUG rights for NTFPs withheld in forests where DOF has separate agreements with other companies	Curtails access to local resources
Absence of NTFP management directives and guidelines for community forests	NTFPs controlled centrally and permits given to big contractors, reducing local access and incomes
Inadequate financial incentives to community based NTFP enterprises	Business opportunity goes untapped at local level
Impractical enterprise registration and establishment formalities for SMFEs	Business opportunity goes untapped at local level
Bureaucratic harassment on commercial use of forest resources	Lost or reduced income of local communities
Distorted implementation of regulatory provisions – e.g. royalty for NTFPs from private forests and cultivation, wrong identification of species, etc.	Individual cultivators discouraged to grow and earn money

## Tenure

Tenure is a very important issue with respect to SMFEs, especially because these enterprises depend on community, government-owned and open access resources. Forest regulations in Nepal emphasize control in extraction, use, trade and marketing. Access and entitlement to these resources are a complex and ambiguous issue.

**Ban or restrictions.** Some species of NTFPs are banned from collection, while others are banned for export in crude form (HMG, 1995). Although the idea behind this is to conserve such resources/species from extreme pressure and the threat of extinction, it has not been able to enhance conservation; rather illegal trade and smuggling has taken place. This has therefore created more unfavourable conditions for the preservation of such valuable species, besides reducing the incomes of local communities. For instance, Okhar (*Juglans regia*) bark and Panchaule (*Dactylophiza hatagirea*), which have tremendous commercial value as medicines, have been completely banned from collection and trade. The illegal trading results in an increased handling cost to traders, and this in fact has reduced the prices collectors get from traders. Similarly some products are banned from export in crude form, but the legal definition of processing is

not very clear, so some provisions curtail access to these products, especially for poor farmers and small entrepreneurs.

**Ownership confusions.** The handover of national forests to community forest user groups and leasehold groups allows, in principle, the access of these groups to resources. However, the Department of Forest (DOF) has licensed products to various collector companies from several patches of national forests in the middle and upper-middle hills of the country. Contradictions of this kind have been experienced in the case of resin and paper in Baitadi and Baglung districts respectively. Private collector parties are given exclusive collection rights on top of the CFUG, which reduces the options for the CFUG and their ability to effectively manage the resource base. In order to avoid such problems and raise community ownership over the local resources, contractual provisions between DOF and companies should automatically terminate once the forest is handed over to the communities.

**Complex formalities for private forest products.** Producing and selling timber as well as NTFPs is considered a difficult and illegal business. The entrepreneurs and traders are not adequately encouraged to grow and market forest products from private land. Complex formalities and procedures to transport and trade timber from private forests, and conditions for district level supply before trading outside in case of forest products from community forests, are not conducive to sustainable forest resource management and utilization. Though the registered private forests are given enough freedom with regard to forest products use and transport by the existing Forest Act and Rules, in practice the small holder and/or private tree growers have to cope with difficult and lengthy formalities in relation to felling, limbing, and sawing as well as transport and sale. Private tree and NTFPs should be allowed for free trade according to the owner's will.

## **Trade**

Nepal adopted an “economic liberalization” policy in the early 1990s and several barriers to trade and commerce were loosened subsequently. However, in the case of forest-based enterprises and forest product trade, there are several policy issues. Trade on timber or NTFPs is often perceived as an illegal and opaque business, involving several instances, rent-seeking and under-the-table arrangements.

**Export formalities.** The SMFEs and other companies that export forest products (crude, semi-processed or finished products) have to go through a tedious process. They need to obtain a collection permit, transport permit, certificate of origin and certificate of identification (involving CITES clearance). One has to go to several departments (see Table below), and each has a lengthy cycle of approval process, so it is very difficult to ensure timely delivery of orders to overseas clients.



**Table 10. Legal Steps for Collection and Export**

Requirement	Issuing Agency
Collection Permit	DFO/CFUG
Royalty Payment	DFO/CFUG
Issue (transit) Permit	DFO
Local Taxes	DDC
Certificate of origin	FNCCI/NCC
Product Certification	DPR/ DOF
Export License	Department of Industries
Export Duty	Customs office

**Ban and restrictions.** As discussed earlier, the government of Nepal has imposed several bans and restrictions on forest products collection, processing, transportation, trade, and export. These bans and restrictions are arbitrary and unpredictable: some products are banned now and the ban is lifted in some uncertain future time and therefore there is a sense of uncertainty in forest products trade.

**Royalty rates.** DOF collects a royalty from the NTFPs collected from national forests according to the rates specified in the regulation. However, the current system to determine royalty rates is arbitrary. Rates remain fixed until the rules change. There are different royalty rates for the same plant listed under different names. The rate has to be determined so as to ensure conservation, as well as a sustainable utilization and trade of the NTFP resources. Local agencies (DDCs/VDCs) also in some cases have imposed local taxes on different NTFPs and/or their derivatives before they could be exported from their respective districts. Uncoordinated taxation under the provisions of different regulations has negative implications over the market and also over those who make a living through the collection and trade of NTFPs. The effect is that the share of benefits that collectors can get has sharply decreased. Rates have to be periodically revised with a view to increase the return to the local collectors as they are the ones who have least benefited.

**Transport.** Most forest products are collected in remote areas of Nepal and have to be transported a long way to Kathmandu or other trading centres. On the way traders have to pass through several checkpoints set up by the police, the Forest Department, and local governments. At each point, the products or documents have to be submitted for inspection. This increases transportation time, creates unnecessary hassle to entrepreneurs, and at times involves corruption. In many instances, the quality of forest products degrades due to the long transit time.

### Forestry policies

Among forestry sector programmes, community forestry is the most successful and popular programme in Nepal. There are more than 15 000 community-forest user groups (CFUGs) and about one third of the total population manages more than 20.5 percent of the country's forests (CPFD, 2006). Nepal's Tenth Five-Year Plan (2002–2007) recognized the potential for a sustainable use of forest resources for poverty alleviation through the promotion of forest-based micro and small enterprises. Some 500

forest-based enterprises involving the poor and socially excluded families of community forests (CFs) have been targeted in the plan. Income generation programmes are planned for 253 000 households in CFs and 25 680 households in leasehold forests (HMGN, 2002). Although forest policy has been favourable, government initiatives have focused mainly on the promotion of community-based conservation and the fulfilment of subsistence needs. Government institutions, however, have tended towards cumbersome bureaucratic procedures. For example, forest-based enterprise registration requires a three-party consensus (District Forest Office, Cottage and Small Industry Development Board and Land Survey Office) on the feasibility and the environmental impact of the proposal.

Although the policy set empowers CFUGs to independently manage, use, and trade the forest resources of their CFs, the trade of forest products is constrained by authoritative, conservation minded forest officials. These officials exercise significant authority with regard to forest enterprise development, sourcing of raw materials from government-controlled forests, and transportation of forest products. Furthermore, multiple taxations of forest-based products make it difficult for many entrepreneurs of forest-based enterprises to operate profitably. This situation favours influential traders who can control the trade of forest products through their business connections and relations with authorities. Banks and financial institutions are almost nonexistent in rural areas. District cottage and small industries development offices, which are mandated to provide business development services, provide skill-development training courses to only a few individuals. Although there are some NGOs in the districts, their understanding and capacity related to enterprises is weak. In addition to CFUGs, there are some grass-roots savings and credit groups, as well as local clubs that try to promote income generating activities, although their focus is primarily on social issues rather than on enterprise development. Despite seemingly strong potential, an enterprise-oriented forest management and the promotion of forest-based enterprises remains underdeveloped.

**Table II. Forestry Policies and their Effects on Community Based Forest Enterprises in CF**

Year	Policy/Legislation	Effect of Policy/Legislation
1957		Indiscriminate cutting of forests Conversion of private forests into farm land in the Terai
1961	Forest Act	Forest categorization Forestry officials empowered
1967	Forest Protection Act, special provision	Judicial power to forestry officials Law enforcement power reinforced
1976	National Forestry Plan	Recognition of people's participation in forest management Concept of village Panchayat forest
1977	Amendment in Forest Act	Provision of Panchayat Forest and Panchayat Protected Forest
1978	PF and PPF Rules	Handing over National Forests to village Panchayat (elected village body)
1982	Decentralization Act	Authority to District and Village Panchayat Promotion of User's Committee concept
1987	Revision of PF and PPF Rules	Provision of user's committees for forest management.
1989	Master Plan for the Forestry Sector	Incorporated the concept of CFUG Priority given to community forestry
1993	Forest Act (including amendment)	Users as managers of forests CFUG empowered for forest management
1995	Forest Rules (including amendment)	Process of community forestry detailed Forestry staff's role changed from custodial to facilitation Initiation of community-based forest enterprises with different models (Malika Handmade Paper, facilitated by ANSAB)
1999	Revision of Forest Act	Control mechanism brought for violation of operational plan Provision for spending 25 percent in forestry activities
2000	Forestry Sector Policy	Initiated enterprises under the facilitation of NGOs and the advocacy of FECOFUN Degraded and scattered forest areas in Terai & Inner Terai can be managed as community forests CFUGs in Terai to give 40 percent of their income from the sale of surplus timber to the government for program implementation (until July 2003, CFUGs paid 40 percent of their income to the government, subsequently reduced to 15 percent for only two species through the financial bill enacted in July 2004)
2004	Herbs and NTFPs Development Policy	Clearly mentions that forest-based enterprises (community and private) are the means for rural employment generation, poverty reduction and sustainable resource management.

Source: Kannel, K.R. 2005, Current Status of Community Forestry in Nepal, Regional Community Forestry Training Centre for Asia and the Pacific, Bangkok, Thailand.

### Environmental policy

Nepal's environmental policies, including the National Conservation Strategy (1983), Nepal Environment Policy and Action Plan (1993) and key legislations (Environment Protection Act and Environment Protection Regulations) emphasize a balance between economic development and environmental conservation. A high-level National

Environmental Council (see below) is set up to establish policies and priorities, as well as to oversee environmental protection measures. A new Ministry was also established in the 1990s, named the Ministry of Population and Environment, which evaluates projects as to their environmental implications. The National Conservation Strategy (1983) aims at protecting areas that contain essential habitats for terrestrial and aquatic mammals, migratory birds, freshwater fishes, as well as rare and/or endangered species. It seeks the conservation of Nepal's natural resource base through a sustainable use. Similarly, Nepal Environmental Policy and Action Plan (1993) aims at preserving endangered species and their habitats, promoting private and public institutions for biological resource inventory and conservation, and strengthening the capacity of the Department of National Parks and Wildlife Conservation to act as the main institution responsible for biodiversity conservation. The act and regulations set out standards and procedures for environmental protection measures to be taken up by projects. The Ministry of Population and Environment has published EIA Guidelines that prescribe requirements and standards for environmental assessment and audits.

In addition to these general provisions, there are environmental wings in a number of government ministries. For instance, the environmental division at the Ministry of Forest evaluates the Environmental Impact Assessment reports of the projects proposed (such as forest-based industries). In general, however, Nepal's environmental policies, legal provisions and government guidelines have set stringent provisions, such as the requirements for environmental impact assessment (EIA) and initial environmental examination (IEE). SMFEs that operate with modest environmental effects have to go through a detailed EIA and cumbersome approval process. In many instances these requirements are a deterrent to SMFEs development.

## **MAJOR POLICY AND LEGAL DOCUMENTS**

Here we identify and list the major policy and legal documents that relate to the forestry and environmental sectors in general. These documents are classified into five groups as: a) biodiversity-related policy documents; b) water-related policy documents; c) environment-related policy documents; d) other policies; and e) international instruments related to the environment to which Nepal is a Party.

### **Biodiversity Related Policy Documents**

1. Aquatic Life Protection Act, 1961
2. Pasture Land Nationalization Act, 1974
3. National Park and Wildlife Conservation Act, 1973
4. National Conservation Strategy, 1998
5. Nepal Biodiversity Strategies, 2002
6. Plant Protection Act, 1972
7. Buffer Zone management Guideline, 1999
8. National wetland policy, 2003
9. Wetland Policy 2059 B.S.

## Environment Related Policy Documents

### Box 4. Environment-related policy documents

1. Nepal Environmental Policy and Action Plan, 1993
2. EIA Guideline for the Forestry Sector, 1995
3. Environment Protection Act, 1996 and Environmental Protection Regulation, 1997
4. Lands Act, 1956 (Revised 1965)
5. Nepal Factory and Factory Worker's Act, 1958
6. Nepal Industrial Development Corporation Act, 1958
7. Aquatic Animals Protection Act, 1961
8. Industrial Enterprises Act, 1962 (new Act, 1992)
9. Forestry Act, 1963
10. Irrigation Act, 1963
11. Nepal Electricity Act, 1964
12. Tourism Industry Act, 1965
13. Plants Protection Act, 1972
14. National Parks and Wildlife Conservation Act, 1973
15. Pasture Land Nationalization Act, 1974
16. Decentralization Act, 1982
17. Solid Waste Management and Resource Mobilization Act, 1986
18. Royal Academy of Science and Technology Act, 1988
19. Water Resources Act, 1992
20. Forest Act, 1993

### Other Policies

1. The Tenth ( Five-Year ) Plan (2002 – 2007)
2. Local-Self Governance act , 1998
3. New Industrial Policy ,1992
4. New Trade Policy, 1982
5. Trade and Transit Agreement (with India),1992
6. Import and Export (Control) Act, 1997
7. Collaborative Forest Management Guideline, 2003
8. Procedural Guideline for the Sale of Forest Products 2060 B.S.

## KEY POLICY INSTITUTIONS IN NEPAL

Here we identify and provide a brief discussion of three key policy institutions of Nepal. These include: (a) the Parliamentary Committee on Natural Resources and Environmental Protection; (b) the National Development Council; and (c) the Environment Protection Council.

### Parliamentary Committee on Natural Resources and Environmental Protection

The Parliamentary Committee on Natural Resources and Environmental Protection (PCNREP), under the chairmanship of a parliamentarian, oversees government action in initiating natural resources conservation and environmental protection measures. The Committee also gives advice to the executive branch of the government regarding appropriate measures for improving national environmental health. Being a legislative subunit, PCNREP can give directives to, and seek information and clarification from, the executive branch of the government.

The PCNREP is headed by an independent chairperson elected by the Committee members from among the members of the House of Representatives. The PCNREP has up to 11 ex-officio members, comprising the Prime Minister and other Ministers, together with 22 members of the House of Representatives nominated by the parliamentary committees of the various parties. While the PCNREP was instituted under the Constitution of 1990, it is still unclear whether it continues to exist under the incumbent Constituent Assembly as elected in April 2008.

### **The National Development Council**

The National Development Council (NDC) is the highest policy-level body. Formerly chaired by the King of Nepal, the Council is now chaired by the Prime Minister. Its mandate includes providing guidance on major policy issues and periodic plans. The membership of the NDC comprises all Cabinet rank ministers, all the members of the National Planning Commission (NPC), the chairpersons of the various parliamentary committees, the chairpersons of two District Development Committees from each of the five development regions of the country, the leader of the main opposition party in the House of Representatives, the chairpersons of all national level political parties, the president of the Federation of Nepal Chambers of Commerce and Industry, and other nominated persons. The NPC serves as the NDC secretariat.

### **The Environment Protection Council**

The Environment Protection Council (EPC) is a high-level body that was created in 1992 to provide guidance on the formulation of environmental sector policies, the preparation of working procedures and the implementation of policies in pursuit of the following objectives:

- the effective management of natural and physical resources;
- the achievement of sustainability by maintaining a balance between development efforts and environmental protection;
- the provision of support to efforts for sustainable development through the use, management, development and protection of physical resources and heritage, taking into consideration the social, economic and cultural needs and opportunities of present and future generations;
- the timely identification of likely adverse environmental impacts from population growth, haphazard settlement and development projects, and the prevention and mitigation of such impacts;
- the development of a national system for environmental planning, environmental impact assessment and evaluation, pollution control and the protection of the national heritage;
- the utilization, development, management, and protection of the capacity to regenerate and recycle physical resources, without inflicting adverse impacts on the environment;
- the implementation of special measures for the protection and promotion of rare and endangered national wildlife, plant species, biological diversity, the genetic pool, natural and cultural sites, and environmentally threatened areas, in accordance with their importance;

- the preparation and improvement of the environmental legal framework;
- the development and coordination of activities undertaken by governmental agencies and non-governmental organizations (NGOs) for the effective implementation of environment-related laws and policies;
- the establishment and operation of an environmental protection fund;
- the dissemination of information and the improvement of education and public awareness related to the environment;
- the development of human resources in the area of the environment.

The membership of the EPC comprises the ministers of several ministries, senior civil servants, representatives of NGOs and the private sector, as well as professionals. The Ministry of Population and Environment serves as the EPC secretariat. The Ministry is also required to carry out EPC directives. The Minister, State/Assistant Minister, and Secretary of the Ministry of Population and Environment are appointed as the vice-chairman, member and member-secretary of EPC, respectively, thus providing the necessary links between the two agencies.

## **POLICY INFLUENCE ON SMFES**

The following issues are the most influential on the existing policy and legal provisions regarding the establishment and operation of SMFES:

- The government policy since the 1990s has been about encouraging the private sector to take up the lead in economic activities. Accordingly, private companies, individuals, cooperatives as well as CFUGs can establish and operate SMFES.
- While the Herbs policy of 1961 (BS) has broadly envisioned to promote NTFP enterprises, it is not clear on the details about how to promote SMFES.
- NTFP trade has many barriers, from collection in the raw form to processing, trade and export. The government has imposed arbitrary royalty rates for NTFPs collection from national forests. This has promoted illegal trade, rather than genuine entrepreneurship.
- There is no clear mechanism to distinguish NTFPs collected from private land and government forests to such extent that even for NTFPs collected from private land SMFES have to pay a royalty to the government.
- Environmental policies, legal provisions and government guidelines have set stringent provisions, such as the requirements for environmental impact assessment (EIA) and initial environmental examination (IEE). SMFES that operate with modest environmental effects have to go through a detailed EIA and cumbersome approval process. In many instances these requirements serve as a deterrent to SMFES development.
- Forest policy and legislation in Nepal are primarily focused on resource conservation and subsistence use. These do not envision incentives to establish forest-based enterprises.

## LABOUR ISSUES

In the manufacturing sector, all small enterprises with less than ten workers are categorized as informal (Labour Act, 1992). Nepal became a member of the ILO in 1966. In 2005, the constituents of Nepal, in line with Nepal's PRS, have developed a National Plan for a ten year period. Agriculture (including forestry) in Nepal provides direct employment to six and a half million of the labour force which accounts for four-fifths of the total economically active population. Four and a half million labourers are self-employed and over two million work as wage labourers. Almost half of the wage workers are part-time workers and come from marginal and small holdings. Another one million labourers are full-time farm wage workers. These workers are landless and subsist on wage income. Out of every ten full-time wage workers, 7 work as casual workers and 3 work under a permanent labour relationship generally interlinked with credit and land relationships (Sharma, 1998).

To be more specific, safety measures are not adopted by labour as per the government directives during the collection and processing of NTFPs and workers are not equipped with all the protective gear due to financial constraints and lack of awareness. Workers are not trained and generally unskilled or semi-skilled manpower is used. Similarly, there is no insurance policy related to injuries and life for the workers involved in the collection, processing and transportation etc. of NTFPs. In hilly areas of Nepal, road networking is very limited and generally seasonal and therefore crude and processed forms of NTFPs are usually either manually transported or air lifted.

The law prohibits forced or compulsory labour, including that performed by children; however, such practices have been reported. The Department of Labour enforced laws against forced labour in the small formal sector, but remained unable to enforce the law outside that sector. Likewise, child labour is a significant problem. The law stipulates that children shall not be employed in factories, mines, or 60 other categories of hazardous work, and limits children between the ages of 14 and 16 years to a 36-hour workweek (six hours a day and six days a week, between 6.00 hours and 18.00 hours). The Child Labour Act principally applies only to formal sectors of the economy, such as tourism, cigarette or carpet factories and mines. Another important issue is wages, which are insufficient to provide a decent standard of living for a worker and a family.



## DIAGNOSIS OF SELECTED NON-TIMBER AND TIMBER PRODUCTS

In this chapter we present a full diagnosis of five major non-timber forest product (NTFP) species; Lokta (*Daphne species*), Jatamansi (*Nardostachys grandiflora*), Chiraito (*Swertia chirayita*), Kurilo (*Asparagus racemosus*) and Wintergreen (*Gaultheria fragrantissima*) and one timber species: Sissoo (*Dalbergia sissoo*). These six species and their products are the ones that are commonly traded or cultivated. This diagnosis complements the discussions on small and medium forest enterprises (SMFEs) in the earlier chapters of this report.

### KURILO- *ASPARAGUS RACEMOSUS* WILD

#### Introduction

Kurilo (*Asparagus racemosus*) is a perennial, much branched, straggling, spinous under-shrub with tuberous rootstock and angular branches. The root stock bears numerous fusiform succulent tuberous roots which are 30–100 cm long, 1–2 cm thick and tapering at both ends. The stems are woody, whitish grey and armed with strong and straight recurved spines. The leaves are linear-subulate, shorter than the spines, and often reduce to sub-erect spines. Flowers are white, fragrant, small and in a branched raceme: raceme solitary, or in fascicles, 1.5-2 cm long.

#### Biology

##### A. Taxonomy

Scientific Name:	<i>Asparagus racemosus</i> Wild [Syn. <i>Asparagus volubilis</i> Buch-Ham]
Family Name:	Liliaceae
English Name:	Wild asparagus
Vernacular Name:	Kurilo, Satawari, Makuri (Nepali); Abhiru, Satamuli, Satawari (Sanskrit); Pasura (Gurung); Satamuli, Satawar (Hindi); Kuril (Newari); Kobi (Tamang); Jodung (Chepang); Kurla, Satawar (Tharu)

##### B. Conservation status

The government of Nepal, Ministry of forest and Soil Conservation (MoFSC), Department of Plant Resources has made a national priority list of medicinal herbs for cultivation which lists the *Asparagus*. It is also prioritized by the Dabur Nepal for farming in the mid-hills of Nepal. The Conservation Assessment and Management Plant (CAMP) has listed the *Asparagus* in the list of vulnerable plants for sustainable management.

##### C. Distribution and habitat

Kurilo is a scandent climber, distributed throughout the tropical region of Asia, Africa and Australia. In Nepal, it can be found in the Terai and in the mid-hills. It is native to mid-Asia, Russia and Northern-Europe. It can be found in Pakistan, Sikkim, India, Northeast Asia, Australia, Africa as well as in Nepal's tropical to temperate regions at 150–3 000 m altitude. In the tropical to temperate bioclimatic zone, ascending up to 1 800 m altitude from mid to east Nepal and up to 3 000 m at west Nepal, kurilo grows well and is found

throughout the country. Naturally, it can be found mostly in community forests, national parks and conservation areas rather than in cultivated lands and private forests. The plants are successfully grown in black cotton soil, having a 6.6 pH level, and mixed with river sand. It prefers well-drained rich loamy soil.

Kurilo blooms from May to September. Fruits are set from June to October and are completely ripe by the month of February. Seeds can be collected from November to February and roots from February to March before sprouting.

#### **D. Regeneration**

Under natural conditions regeneration takes place by dispersal of seeds. Kurilo is either cultivated by seeds or from adventitious roots. Seed propagation is the best means for multiplication. Seeds for propagation should be collected from the mature plant (more than 3 years old). Seeds must be kept in the shade for about 1–2 days and thoroughly washed in water for propagation purposes. The hard and endospermic seeds, after pre-treatment by soaking them for 24 hours in cold water, are shown on nursery beds. Germination starts after two weeks but it varies according to the age of the seeds. The germination percentage is about 80 percent. After two weeks, seedlings can also be transplanted into containers. Seedlings will be ready for planting in 5–6 months when they reach a height of 15–25 cm. Planting is best in April–June in hilly areas and in May–June in the Terai (low land) regions. About 1 000 kg dried tubers can be obtained from a one hectare field.

Cultivation from roots is generally found in low scale farming or in research plots. It is necessary to collect the roots in February–March before the plant starts sprouting. The adventitious roots taken from the mother plants from the forest are dipped in a cow dung solution for 24 hours before planting them in nursery beds. Water logging should be avoided. The roots begin to sprout in 8–10 days and after attaining 15–25 cm height in 2–3 months, they are ready to be transplanted in the field. Roots are ready to be harvested in the third year. The best crop may yield 3 to 5 tonnes/ha. In commercial cropping of kurilo in Dabur Nepal plots 10 month old plants yield about 1.4 kg roots. It is expected to yield about 2.6 kg of roots from 40 month old kurilo plants.

### **Sustainable Resource Management**

#### **A. Management system**

For the sustainable management of Kurilo its roots must be collected only from mature plants over three years old. For its management in natural stands the area must be divided into three management blocks in order to ensure a sustainable yield. Each single block is harvested once a year, block I in the first year and block III in the third year. In the fourth year the kurilo roots of the first block will be ready to be harvested again. Roots can be collected by employing uprooting methods and 2–3 (20 percent of the total stalks) roots must be left in the ground and covered by soil for regeneration.

Similarly, collection must be granted as per the availability in the site, farming must be encouraged in places where it is possible including government, community and private forests; community forest user groups (CFUGs) must be encouraged to manage and cultivate kurilo by prioritizing in their operational plan. Dissemination of information must

be done by national level organizations addressing the production, development, processing and marketing trend of kurilo.

### **B. Harvesting**

Special attention must be given while collecting the roots because the roots are commonly used for commercial purposes. Care must be given to sustainable production while collecting the roots. It is better to leave 20 percent or 2–3 roots under the soil for sustainable reproduction. Seed collection can be done by shaking the tree and its branches. It is done in November–February.

### **C. Store and value addition**

At the time of harvesting, roots are dug out from the soil, cleaned from adhering soil and cooked in a big bowl to remove the outer cover and the inner hard fibres. The outer cover can be removed by pressing the rhizome between two fingers and drying it in the sunlight for a few days. Well-drained roots must be stored in a well ventilated room. The weight measured in the summer season may be 15 percent less than the weight measured in the winter season.

## **Uses**

### **A. Indigenous**

In central Nepal, vegetable soup prepared from the crushed root is given to treat diarrhoea. As a veterinary medicine roots/tubers are fed to cure milking disorders of cattle. Tharu (native ethnic community of the Terai) people use roasted root mixed with water to treat burning sensation while urinating. In the Ayurvedic medicine system, the drug of Kurilo is considered as galactagogue. Tubers of Kurilo are useful for the treatment of tuberculosis, hysteria, night blindness, kidney and stomach problems. Locally, the root is being used to control fleas and as an energetic tonic. In April–May, the tender shoots can be collected to be used as vegetables. In some areas of Nepal, shoots are also used to make alcohol. The whole plant is used for the treatment of diarrhoea, diabetes and rheumatism. Seeds are also used for blood purification.

### **B. Commercial**

*Asparagus racemosus* Wild exhibits anticancer, astringent, tonic, laxative, aphrodisiac, and cardiac stimulant activities. It is used against leprosy, dyspepsia, gonorrhoea, epilepsy, night blindness and throat complaints. Satabari chuma, Saktibardhak yog, Satabari grit, Ashwoganda oil, Narayan oil etc. are the major Ayurvedic preparations of *Asparagus racemosus* Wild.

## **Marketing**

### **A. Production volume, trade and market price**

The use of Kurilo is increasing in the Ayurvedic and modern medical science. There are two types of *Asparagus*, which are being traded in Nepalese and Indian markets, and the price of the larger one is higher than that of the smaller one.

Now in Nepal, about 60 to 200 tonnes of Kurilo are collected and exported every year. In total, about 40 percent is collected only from the Makwanpur district. Global market demand accounts for about 700 tonnes of Kurilo. It was recorded that 45 tonnes were exported from Sunsari, Lahan in 1992. The main trading hubs in Nepal are in Nepalgunj,

Dharan, Lahan, Basantapur, Hile, Hetauda, Pokhara, Dang, Kathmandu, etc. Professional and large scale production of *Asparagus* does not exist in Nepal yet. Due to the lack of detailed studies on farming, there are no selections of climate-suitable species of *Asparagus*. Dabur Nepal has already started commercial farming of Wild asparagus in Bara and Tamagadi farms of Simara by importing seeds from Australia. The total quantity of *Asparagus* traded from Nepal is given below.

**Table 12. Traded amount of Asparagus from Nepal**

S. No.	Year	Tonnes
1	1989	71
2	1990	56
3	1991	40
4	1992	197
5	1993	52
6	1999	44
7	2000	92
8	2001	115
9	2002	128
10	2003	104
11	2004	107
	<b>Average</b>	<b>98</b>

Source: Kunwar, R.M. 2006. Non-timber Forest Products of Nepal

### **B. Government royalty**

Forest Regulation 1995, Section 3 and its amendment 2005 describe the government royalty for different medicinal plants and according to it the royalty for dried rhizomes of *Asparagus* is NR 5/kg and for seeds and branches is NR 2/kg.

### **C. Market chain**

Many farmers are involved in the collection of *Asparagus* roots because of their abundance in cultivated farms, community forests and national forests. After collection, simple processing is locally done and sold or exported to India and abroad. In the marketing system all collectors, farmers, small traders, local traders, wholesalers and processors are involved. The marketing system is as follows:

Farmer/collectors --> Local traders -->Regional traders -->Wholesalers -->Exporters

Farmer/collectors --> Local traders -->Wholesalers/Exporters

Farmer/collectors --> Local traders -->Processors --> Wholesalers/Exporters

## **Socio-economic and Policy Issues**

### **A. Socioeconomic factors**

Collection of *Asparagus* roots is common in cultivated farms, community forests and national forests. This is one of the most important income sources for rural people. Basically, poor farmers who have less land holdings are mainly involved in Kurilo collection and trade for their subsistence. The roots and seeds can be used for commercial purposes. Seeds, tender shoots, roots and root bark are used for commercial and indigenous uses. At national level, its threat is not known. Local people believe that

more milk can be produced if pieces of roots are given to the livestock. Tender shoots can be also used as vegetables and as a very common food in the mid-hills as well as in the Terai. If rhizome powder is given to a feeding mother, it benefits both the mother and the child. Dissemination of information must be done properly to pursue its farming largely in the private sector as well.

## **B. Government policy on collection, processing and trade**

### **Current policy:**

According to the Forest Act 1993 and Forest Regulation 1995, any NTFP collectors willing to collect from government forests must submit an application to the District Forest Office (DFO) specifying the quantity and location for collection. If *Asparagus* is to be collected from community forests, the collector has to get permission from the Community Forest Users Group (CFUG) of the same community forest.

### **Policy constraints:**

Several unnecessary check points from the district to the border are the main constraints, which are responsible for harassing the traders. Therefore, marketing channels of NTFPs is quite complex and on the other hand there is lack of marketing and price information, which impacts on the collection and production level. Neither the government nor other institutions produce price information for NTFPs on a regular basis but it is affirmed that such information is in order to help collectors/producers and/or CFUGs maximize their profit margins from NTFPs. Irrational royalty establishment and collection, different forms of informal taxes and unnecessary regulatory barriers are the main policy related constraints.

## **Key Opportunities and Threats**

Many farmers are involved in the collection of *Asparagus* because of its abundance in cultivated farms, community forests and national forests. Likewise, it is one of the potential species for cultivation in community forests. Therefore, CFUGs must prioritize cultivation of *Asparagus* in their management operational plan. In the context of community forestry, securing tenure rights for producers and collectors through long term resource management policies is favouring local producers/collectors (e.g. CFUGs). The private sector needs to take full advantage of the current policy provision of leasehold, private forestry and community forests to invest in the area of establishment of better planting materials of NTFPs. Due to the current limited bargaining position of primary producers/harvesters, there is a chance to form groups and/or networks such as production and/or marketing co-operatives to influence NTFP dealings more effectively.

Lack of broad-based sustainable production practices for NTFPs and scattered sources of raw materials as well as the lack of marketing networks at local level are major threats. These cause an availability problem on the part of buyers (wholesalers and/or final buyers). Inadequate knowledge of products and the market on the part of collectors/producers cause lack of access to favourable markets and prices. Likewise, inconsistent/irregular demand for various raw materials on the part of buyers (wholesalers and/or final buyers) is another problem.

## CHIRAITO-SWERTIA CHIRAYITA (ROXB. EX. FLEMING) KARSTEN

### Introduction

Chiraito is a medicinal plant. It has medicinal, ethno-botanical, economic, environmental and historical values. It possesses multipurpose Ayurvedic and Allopathic medical properties. The whole plant is used to treat more than a dozen diseases, ailments and disorders. Chiraito is a biennial herb, 60–125 cm tall, stem robust, branching, cylindrical below, 4-angled upward, containing large pith, leaves are broadly lanceolate, 5-herbed, sub-sessile, lurid greenish yellow flowers, tinged with purple, in large panicles, many egg-shaped capsules, sided, minute seeds, smooth and with many angles. Chiraito occupies one of the major positions in the trade of medicinal and aromatic plants. A total of 7 110 kg of dried Chiraito was estimated to be traded from the Dolakha district (DFO, Dolakha), and 3 500 kg of dried Chiraito was traded from Basantapur, Tehrathum district (Federation of Commerce and Trade, Basantapur) in 2001. The whole part of this plant is traded. Chiraito is one of the major valuable Ayurvedic medicinal plants in Nepal and India.

### Biology

#### A. Taxonomy

*Swertia* comprises 100 species (Airy Shaw, 1973) of which 27 species are reported to be from Nepal (Hara *et.al*, 1982). Around nine species of *Swertia* are reported to be in trade in different trading centres of Nepal. Among them *Swertia chirayita* is considered the one superior in quality.

**Scientific Name**

*Swertia chirayita* (Roxb. Ex. Fleming) Karsten

**Family Name**

Gentianaceae

**Local Name**

Chiraito, Tite (Nepali); Khalu (Newari); Kirattikta, Kirat (Sanskrit); Tento (Gurung); Timda (Tamang); Tigta (Sherpa)

**English Name**

Chiretta, East Indian Balmomy

**Trade Name**

Chirayata

#### B. Conservation status

Vulnerable (Shrestha & Joshi, 1996)

#### C. Distribution

The genus *Swertia* comes under the Gentianaceae family, which has 100 species distributed in the mountains of Asia, Europe and Africa; among these, 21 species have been recorded in Nepal. *Swertia chirayita* is indigenous to temperate Himalaya at an altitude between 1 200–3 000 m from Kashmir to Bhutan and in the Khasia Mountain. The major *Swertia* growing districts are Sankhuwasabha, Terhathum, Taplejung, Bhojpur, Panchthar, Ilam, Dolakha, Ramechhap, Lamjung, Gorkha, Dhading, Rasuwa, Mustang, Nuwakot, Makwanpur, Baitadi, Dadeldhura, Doti, and Rukum.

#### D. Ecology and habitat

It prefers moist shady places and forms a colony with other plants. On south facing slopes it grows only between 1 500–3 000 m altitude. Evidence suggests it prefers acidic soil in Nepal. It is often found to flourish well in areas with high humidity, long monsoon period, well drained fertile humus, sparsely dense trees, sandy to silt loam soil. Chiraito is

a light demanding spices. It grows in open forest and on the margin of cultivated land in and around village. It prefers the north facing slope of the Mahabharat range. It is found growing in the fire burnt places of forests and in the edge of land slides.

Chiraito prefers to grow in acidic soil conditions with a pH from 4.7 to 5.5 (Bhattarai & Shrestha, 1996). Chiraito is found mixed with other species. The most common associates are: Bhuijn Kaphal (*Fragaria indica*), Bukephool (*Anaphilis triplinervis*), Chari Amilo (*Oxalis corniculata*), Dubo (*Cynodon dactylon*), Ghans (*Digitaria adecendens*), (*Desmodium oxyphyllum*), (*Elsholtzia strobilifera*), Titepati (*Artemesia vulgaris*).

### **E. Regeneration**

The natural regeneration of the plant takes place by the seeds when they become biologically mature and have high potential and viability during November (Bhattarai, 1996). The viability of seeds is very low if they are collected before November. Seeds stored in bad conditions have no viability at all. The viability decreases after the following October. If the seeds are collected after November and cleaned properly, the percentage of germination is reported to be up to 90 percent (Bhattarai, 1991). To start a Chiraito Nursery in November it is possible to collect Chiraito seeds from the forest. The seeds collected should be sown within a year of the collection. Before February the soil is too cold to sow the seeds. It is better to sow them between February and April, into moist, fertile nursery beds. The seeds are covered with a thin layer of soil (whose depth should be twice the size of the seeds). Mulching is necessary for better germination. Frequent water spraying is done to maintain the moisture content of the soil. When the seeds start to germinate, the mulching materials should be removed. Once the seedlings attain a height of 6–8 cm, they are ready for transplantation into the field. Generally 15 cm spacing between seedlings is needed for optimum production. Chiraito should be harvested after three years of growth when the plant is well developed, after the plant has flowered and produced fruit. If harvesting is done after the seeds mature, then the plant can naturally regenerate. Harvesting Chiraito without considering the age of the plant and seed maturity reduces regeneration significantly.

## **Sustainable Resource Management**

### **A. Management System**

The bulk of Chiraito grows in the national forest generally cleared after a forest fire. Chiraito is officially owned and controlled by the government, but is effectively an open access resource. Due to earlier, hazardous harvesting, lack of conservation and cultivation practices, Chiraito is declining in the nature habitat. This has affected the export quantity. Unhealthy competition between collectors has led to an over-harvesting of Chiraito without considering sustainable regeneration. Not only does premature harvesting have a negative impact on regeneration, but immature plants decrease the active ingredient quality of the final product.

### **B. Harvesting**

Manual harvesting is done. From a technological point of view, many people use simple and locally available technologies. For value added harvesting a range of technologies are in practice. November-December is the appropriate time for harvesting but it is not practiced in Dolakha, Terhathum and Sankhuwasabha districts. Collection starts from September onwards. Collection is done manually without using any instruments. The

whole plant is pulled out and sun-dried for a few days and then wrapped by 'choya'. 'Choya' is the bamboo slip used to tie up bundles of Chiraito. Then small dried bundles of Chiraito are gathered into big bundles and sold to local traders.

### C. Storage and value addition

The whole plant is collected for trade. November–December is the trading season of this product. Due to its high price, collectors have high competition for collection and it is collected before maturation. Thus, unmanaged exploitation of Chiraito has resulted in a decrease of natural production. According to the traders in the central and eastern parts of Nepal the production of Chiraito is declining every year.

## Uses

### A. Indigenous

Chiraito is an important medicinal herb used for curing various diseases. Locally this plant is given for malarial fever. The plant is dipped into water overnight and the resulting bitter juice is taken the next morning. It is also used in common ailments like cough, colds, and fever. This plant is bitter with a sharp taste; it is used as an astringent tonic and stomachic. It relieves inflammations and improves eyesight. It is given as a sedative during pregnancy. Chiraito is considered good for pain of the joints, scabies, leucoderma, skin disease, asthma, ulcer and chronic fever.

### B. Commercial

The main active principle is 'Chiretin'. Nine oxygenated xanthenes have been isolated from the whole plant (Gnosal *et.al*, 1973). The bitter principles are the main constituents of the plant. They are included in the Secoirrodoid glucoside group. They are Amarogentin and Amaroswerin. Recently an increased demand for *Swertia chirayita* has been noticed. It has great economical and industrial importance. The product has been discovered by the beverage industry as an alternative bitter product (i.e. used in the liquor industries to impart bitter flavour to the mouth). *Swertia* extract contains Oleanolic acid and Swertiamarin which is used as a hair growth tonic (Suzuki *et.al.*, 1989). Chiraito is also used as one of the ingredients in "Chandra Prabati" which is an Ayurvedic drug for cancer. In Nepal, farmers have been generating income from Chiraito. Some of them have already started to cultivate it as a cash crop. It can be assumed that the economy of poor farmers of high altitude areas could be improved thanks to Chiraito.

## Marketing

### A. Production volume, trade and market price

It is found in temperate Himalaya from the east to the west of the country. About 40 districts of Nepal have been found to contribute to the trade of Chiraito. The major trading centres of Chiraito are Hile, Dharan, Basantapur, Nepalgunj, Trisuli, Birtamod, Ghorahi. Eastern Nepal is the highest Chiraito producing area in Nepal, which accounts for almost 50 percent of the total volume of traded Chiraito. This plant is collected from Dolakha district, from the Central development region, and Terhathum, Sankhuwasabha, Taplejung districts, from the Eastern development region. This species can be cultivated in Panchthar, Dhankuta, Taplejung, Terhathum, Solukhumbhu, Sankhuwasabha, Tanahu, Lamjung, Kaski, Syangja, Palpa, Baglung, Mustang, Gorkha, Gulmi, Baitadi, Bajhang, Dadeldhura, Dailekh, Rukum, Kathmandu, Makawanpur, Dolakha districts. According to DFO information, 7 110 kg of Chiraito are produced annually in Dolakha district. In



Basantapur VDC, 3 500 kg of Chiraito are traded annually according to Federation of Commerce and Trade, Basantapur. In Pyuthan district, 2 000 kg of Chiraito are produced annually.

The trading of Chiraito is controlled by a few big businessmen as wholesalers. They employ middlemen in trading centres, or make previous agreements with road-head traders. Mostly the market price offered by wholesalers to road-head traders depends on the final demand that comes from Indian traders. If the market is good, wholesalers inform previously to road-head traders about the demand. Thus, the quantity of Chiraito supplied for the district depends on the price. If the price is good the quantity automatically increases but if the price is not high the quantity of the supply decreases.

**Table 13. Distribution of profits among stakeholders**

Stake holder	Selling price /kg (NR)	Total volume traded (kg)	Value of total volume traded (NR)	Profits (NR)	Profits (%)
1. Collector	15 -55 (35)	419 300	1 465 500	-	-
2. Village trader/middleman	40 – 60 (50)	419 300	2 0965 000	6 289 500	42.85%
3. Road-head trader	60 – 70 (65)	419 300	2 7254 500	6 289 500	33%
4. Wholesaler	100	419 300	41 930 000	14 675 500	53.8%

Source: ANSAB, 2004

It is estimated that 10–15 thousand tonnes of “Jadibuti” worth US\$8.6 million are traded from the middle hills and high mountains of Nepal to the plains of India every year (Edwards, 1995). This figure is equivalent to NR 430 000 000 where Chiraito accounts for NR 41 930 000. Hence it contributes to almost nine percent of the total trade value of “Jadibuti”. According to information drawn from the trading centre a total of 2 750 542 kg of “Jadibuti” is traded in Nepal where Chiraito accounts for 419 300 kg which is 15 percent of the total volume of herbs traded in Nepal. Actually, the trade of Chiraito contributes with more than 10 percent to the total value of the “Jadibuti” traded in Nepal.

### **B. Government royalty**

The trade of herbs in government records is based on royalties paid by the trader at the District Forest Offices. In practice traders pay a little amount of the royalty in comparison to the volume of herbs collected and traded. Actually, this is a general practice for each and every commodity where a royalty should be paid, so it is observed that traders' data always exceed the government record data. In the present study, traders' information is higher than that recorded by the government. According to the Forest Regulation 1995 Appendix 3, the royalty rate for Chiraito is NR 3/kg.

**Table 14. Market arrival quantity of Chiraito in 2002/2003 in five marketing centres**

Royalty, NR/ kg	Chiraito export data (in kg ) from different centres			
	Khadbari	Basantapur	Hile	Kimangthanka
3	7 500	15 400	13 200	9 240

Source: Traders survey, 2004 from the period of January 2003 – December 2003

**Table 15. Volume of Chiraito export to India and related tax earned in “00” NRs in 2003**

Birgunj Custom		Ranibari Custom		Mehi Custom	
Qty.	Export Tax	Qty.	Export Tax	Qty.	Export Tax
5 250	11 000	20 166	1 178	-	-

Source: Traders survey, 2004 from the period of January 2003 – December 2003

### C. Market chain

Collector- - > Village Trader --> Regional Trader- - > Exporter

Collector -- > Village Trader -- > Exporter

Collector- - > Village Trader -- > Regional Trader -- >Wholesaler- - >Exporter

### D. Market promotion

The following elements and promoters of market should be considered for the promotion of Chiraito marketing:

- market information – location, price, demand;
- development of co-operative societies for marketing and its management;
- inventory (list) of traders and exporters to make available to producers;
- proper management of storage;
- to start and manage processing;
- to raise awareness among farmers about forest laws and acts, specifically on Chiraito;
- to make a one way system of collection and export license instead of a 2 way system;
- implement rural – urban partnership program.

## Socio-economic and Policy Issues

### A. Socioeconomic factors

Chiraito is one of the important sources of income for rural people. It is one of the main exporting commodities as compared to cardamom in the mid-hills of eastern Nepal. It is exported to India, China, as well as to other Asian, European and American countries. It can support poverty alleviation of rural people. Collection of Chiraito is labour-intensive and doesn't involve a gender division of labour. Mostly poor people and farmers with low land holdings are involved in the collection and trade of Chiraito. Mostly children, women and shepherds collect it in their leisure time. In general, each household collected 40

kg/season in Chaite CFUGs of Terhathum district, 2.5 kg/season in Okhare CFUGs and 1.40 kg/season in Kalika CFUGs of Sankhuwasabha district, but in Lakuridada CFUGs of Dolakha district each household collected 500–750 kg of Chiraito per season. The cash generated by selling Chiraito is used to buy food, clothes, salt, etc.

## **B. Government Policy on Collection, Processing and Trade**

### **Current policy:**

Before collection, a permit is required from the District Forest Office (DFO) but it does not exist in practice. Only traders obtain a collection permission before transportation to the Terai market. To release Chiraito from the district of origin to the Terai market, traders must pay a royalty of NR 3/kg and get a permit from the DFO. If illegal Chiraito is found, the DFO is empowered to arrest, conduct a search and initiate a case.

### **Policy constraints:**

There are many forest check posts on the highway to check and monitor the supply of forest products and all businessmen have to have their products checked at the check point and must pay a tax. This is more hassle and a time consuming process. Sometimes, there are problems to market Chiraito at the Indian border custom due to plant quarantine tests, from where most Chiraito (>80%) is exported. There is no clear policy regarding patent rights. The government must try to get patent rights for Chiraito by submitting evidence on this indigenous medicinal herb.

## **Key Opportunities and Threats**

It is a good source of income for poor and medium farmers of remote areas and support to alleviate poverty among rural people. Regeneration in natural habitats (forest marginal land) is depleting each year. The main reason for the extinction of Chiraito is the uprooting of the plant at a premature stage. There is lack of effective conservation practices in the public and private sector.

The fluctuation of the market price is one of the risk factors for traders. In 1999, the market price of Chiraito was NR 350/kg but in 2002 the price came down to NR 200/kg. During storage, 10–12 percent of the weight is lost as the dry Chiraito loses weight when the leaves break away from the bundles. Adulteration of Chiraito with other low quality species of *Swertia* is very common in the trade of Chiraito.

## **JATAMANSI-NARDOSTACHYS GRANDIFLORA DC**

### **Introduction**

Jatamansi is a sturdy perennial and erect or prostrate rhizomatous herb growing up to 75 cm tall. It is locally known as Jatamansi, which refers to the bearded appearance of rhizomes. It has an agreeable odour with bitter aromatic taste and is used as a substitute for valerian. It yields up to 2 percent of essential oil (spikenard oil) with a pleasant odour. The Jatamansi is collected from government owned pasture land and community managed land, and sold to village traders. Thus it is one of the major income generating resources of rural communities. These thick rhizomes are easy to sell in the market. The oil extracted from these aromatic fibrous rhizomes has a high commercial value and is

used in perfumery. The whole plant has a distinct and lingering smell. Rhizome of Jatamansi has a high medicinal value.

## Biology

### A. Taxonomy

*Nardostachys grandiflora* DC is the only species of this genus found in Nepal (Anonymous, 1976); its synonym is *Nardostachys jatamansi* DC.

**Family Name** Valerianaceae

**Local Name** Jatamansi, Bhulte, Bhutle Balchhad, Masijara (Nepali); Pang poe, Dak poe (Tibetan amchi); Naswan (Newari); Gandhamansi, Jatamansi (Sanskrit); Germasi, Jatamansi (Gurung); Pangbu (Sherpa); Poi (Tamang); Kanshykuo (Japanese); Balchhar, Jatamansi (Hindi)

**English Name** Spikenard, Musk root

Jatamansi is a perennial herb which is spindle-shaped, 5–30 cm long, thick, dark grey rhizomes covered with fibres of old leaves and flowering stems. The leaves of Jatamansi range from elliptic-lanceolate to spatulate and sessile of about 5–20 cm mostly basal and arising from the stout and woody rootstock. Lower leaves are larger than upper ones. Flowers range from rose-purple to whitish, dense head in terminal. Calyx is coloured, 5-lobed. Lobes enlarge and become papery. The corolla tube is 6–20 mm long with 5-rounded spreading lobes. Fruit is obovate and single seeded. The whole plant has a distinct lingering smell.

### B. Conservation status

According to the Ministry of Forests and Soil Conservation (MoFSC) notification (Nepal Gazette Vol. 3, Section 51. No. 36 dated 2058/9/16), Forest Act 1993, Forest Regulation 1995, the crude products of Jatamansi are banned for export but the processed extracts are exported after obtaining certification and permission from the Department of Forests or the respective District Forest Offices. The Ministry of Forests and Soil conservation, the Department of Plant Resources has listed Jatamansi under the national property herb species for cultivation and conservation. Dabur Nepal has prioritized 19 medicinal plants for cultivation and Jatamansi is one of them.

The World Conservation Union (IUCN) Nepal and the Conservation Assessment and Management Plan (CAMP) Nepal has respectively listed Jatamansi under the endangered and vulnerable species category. It is included in the CITES Appendix II. It is considered as a locally endangered species in Dolpa district.

### C. Distribution

Jatamansi is distributed in subalpine to alpine regions in dry, open conifer forests, rocks, edges, small depressions, scrubs and in open meadows mostly on north-facing slopes. It is found in the alpine Himalayas from Punjab to Sikkim, from Bhutan to the province of Yunnan and Szechwanin, South West China at an altitude range of 3 000–5 000 m (Polunin and Stainton, 1987).

It is mostly found in eastern to western regions of Nepal and is abundant in Dolpa, Humla, Jumla, Mugu, Taplejung districts growing on open, stony, grassy slopes and on the turf of glacial flats. An average of 10 tonnes of Jatamansi are collected and exported per

annum only from Dolpa district. *Nardostachys grandiflora* DC is only one species of the genus *Nardostachys* found in Nepal.

#### **D. Ecology and habitat**

Jatamansi (Spikenard) is abundantly grown in the open, moist, mossy, rocky and sandy northern part of the Lower Mountain. It is found growing under the Birch forest. The Birch forest with rocky texture soil and 25 to 45° sloppy land is suitable for natural growth. Under the Birch forest it has good growth with large leaves and long rootstock. It may be due to the abundance of rotten leaves, humus and shade under the Birch forest. On the southern side its distribution is almost absent. It is not found growing in the same abundance all over its growing habitat. It is also easily grown on rocks, open slopes, edges, small depressions and open meadows. The associated plant species of Jatamansi are Bukephool (*Anaphalis* spp), Dhupi (*Juniperus indica*), Kutki (*Picrorhiza scrophulariiflora*), Ratoghash (*Geum elatum*), Sunpate (*Rhododendron anthopogon*), Pharikatte (*Sorbus microphylla*) and Panchaunle (*Dactylorhiza hatagirea*) etc.

During winter it sheds all leaves and gets buried under the snow. In the beginning of summer snow melts and the plant starts growing. It starts flowering in July and flowering continues until September. Fruiting occurs in October–November. In the beginning of November, all leaves start to turn yellow and become ready for perennation.

#### **E. Regeneration**

Natural regeneration takes place by rhizome and seeds. The plant can be cultivated by the cuttings of underground parts or rhizomes and from seeds. The cuttings of rhizome are the best means for cultivation because the growth from cuttings of rhizome is faster than that from seeds. It is wild but occasionally cultivated in India and China (Shrestha and Joshi, 1996).

### **Sustainable Resource Management**

#### **A. Management System**

Generally Jatamansi is collected from natural stocks. It is found in both national and community managed forests. For collection from national forests, permission should be obtained from the district forest office and it should be granted for community forest user groups (CFUGs) for collection and management of forest products (both timber and non-timber) of community forests. The rhizome is an item of trade which is collected from September to December. In Humla, generally Jatamansi has been collected from Government forests. Collectors collected Jatamansi before seed ripening without caring for the future regeneration. Deliberate fires by grazers were also common in the area to bring new sprouts for their livestock to graze. But the situation has improved as for the management of forest resources after the implementation of the Humla Ecosystem Management Project through local enterprise development, a BCN funded Project. A number of CFUGs have been formed and controlled over the resources by local communities for the last few years. There is a specific management plan developed for Jatamansi within the operational plan of CFUGs. The rotational harvesting system has been developed for sustainable harvest of Jatamansi. The whole forest area has been divided into a number of management units (Blocks). One block is harvested once a year in the appropriate harvesting season. In the second year another block is selected for harvest. This is the way rotational harvest is carried out.

### **B. Harvesting**

Harvesting of Jatamansi rhizomes before September/October is unsustainable. Therefore, the collection of 3–4 year fibrous mature red rhizome from October to December is appropriate in terms of sustainable production. But in Humla district it is sometimes harvested from May to June because of the early snow fall in the appropriate harvesting season. It is possible to harvest its red rhizome after melting the snow in December and it can be done by using a sharp kuto (a small spade as a hand tool). At the time of harvesting other plants in the vicinity should not be damaged.

It is imperative to do selective harvesting or 3-4 years of rotational harvesting. Rotational harvesting can be done by dividing the entire area into 3–4 blocks and managing its collection per block per year on a rotational basis. According to research done by a CFUG in Jumla, there was 3.86 gm/plant rhizome production in two years of rotational harvesting while in conventional practice there was only 2–2.8 gm/plant. The farming practice ensures three times more regeneration.

### **C. Storage and value addition**

Collected parts (root/rhizome) should be cleaned; air-dried and then packed in jute bags or other ventilated bags and stored in well air-circulated dry places. Since rhizomes are used for making aromatic oil, collection and processing should be done with special care. Moreover, the quality of essential oil of Jatamansi is influenced by the maturity of the rhizomes, the preparation form and duration of storage. Quality products get 10–12 percent more value in the market. For commercial purposes, rhizomes are graded, packaged in distillation apparatus evenly with several layers to avoid channelization of steam and distilled with low pressure and relatively dry steam for 9–18 hours. The oil from the local distillation is purchased at a rate of about NR 10 000/kg by Everest co. Kathmandu.

## **Uses**

### **A. Indigenous**

Jatamansi is harvested for local use as well as to trade its valuable roots/rhizomes.

Traditionally Jatamansi rhizome was used together with Juniper and Rhododendron leaves as incense in monasteries and this is still practiced. In Amchi medicine, the leaf is used in headache, high altitude sickness, fever etc. and the rhizome is considered for wound, cough, cold and fever (heart fever, fever due to poisoning), gastritis and swelling. In the Ayurvedic medicine, rhizome is taken as a tonic. It is used in epilepsy, insomnia, indigestion, dysentery, respiratory problems, diuretics, measles, skin diseases, ulcers etc. Paste of rhizome is applied to treat haemorrhoids. Dried plant parts are used as incense. Rhizome juice promotes growth and imparts blackness to the hair.

### **B. Commercial**

The aromatic oil from Jatamansi rhizome is commercially used in perfume industries. Jatamansone, the chemical constituent of Jatamansi rhizome, is used as a substitute of valerian (*Valeriana officinalis*). Generally, local people collect Jatamansi rhizome for commercial purposes. Commercially it is used as an aromatic adjunct in the preparation of medicinal oils, perfumery and cosmetic products. It is used as laxative, carminative,

antispasmodic, tonic, stimulant, antiseptic, diuretic as well as against cholera and intestinal colic.

Interviewed collectors and traders reported that Jatamansi collected from mid-September to mid-October (Asoj) is yellowish, containing the highest oil percentage, in comparison to Jatamansi collected from mid-April to mid-May (Baisakh) when rhizomes are still green and contain less oil. The worst quality one, however, is collected in Srawan from mid-July to mid-August) when Jatamansi turns black and the dried raw material is mixed with dust. It is also found that the Jatamansi form with the drier aspect has good oil content and quality as compared to the Jatamansi from shrub-land and shady places.

## **Marketing**

### **A. Production volume, trade and market price**

Jatamansi is the second largest non-timber forest product exported from Nepal to India and abroad. National and international demand of Jatamansi oil is increasing day by day. There is demand of about 866 tonnes of Jatamansi per year in international markets. On average, 100–200 tonnes of unprocessed Jatamansi are exported from Nepal. Of the total amount, an average of 40 tonnes is solely collected from Dolpa district. In Humla, local processors and Humla Jatamansi, an oil company, process about 30 tonnes of collection while about 40 tonnes are processed in Herbs Product and Processing co. Ltd (HPPCL), Kathmandu. Likewise, about one tonne of Jatamansi is consumed by Gorkha Ayurvedic, Singha Durbar Vaidyakhana and others. According to Edwards (1995) every year between 10 000 and 13 000 tonnes of medicinal and aromatic plants are harvested from the forests of Nepal. The value of their trade to Nepal's economy is estimated to be US\$8.6 millions/year. All unprocessed materials are traded in India and third world countries. Aromatic 7 cm long and 5–7 cm thick stems of Jatamansi are ideal for local and regional markets. Major trade centres of Jatamansi products inside Nepal are Nepalgunj, Dang, Gorkha, Nuwakot, Dharan, Basantapur etc. The annual quantity of Jatamansi traded from Nepal is highlighted below.

Likewise, a total of 204 648 kg of Jatamansi was harvested in 2004 of which local and national distillers consumed 153 859 kg and the remaining 50 789 kg were exported to India through illegal channels. This is a big change from a decade ago when close to 90 percent of Jatamansi was exported to India in raw form. Now Nepali distillers are processing close to 75 percent of the Jatamansi harvested. Another big change from a decade ago is the amount of Jatamansi that is coming from CFUG areas (98%) compared to less than ten percent a decade ago. CFUGs have become more important now due to donor assisted programs in which organisations, such as ANSAB, provided targeted assistance to CFUGs and essential oil products. Ten years ago, the areas where large amounts of Jatamansi are found had few organized CFUGs; this is no longer the case with about 100 CFUGs active now.

**Table 16. Traded amount of Jatamansi, 1988-2004**

Year	Trade amount, MT	Year	Trade amount, MT
(2044 – 45) 1988	64	(2055 – 56) 1999	29
(2045 – 46) 1989	111	(2056 – 57) 2000	83
(2046 – 47) 1990	118	(2057 – 58) 2001	46
(2047 – 48) 1991	70	(2058 – 59) 2002	127
(2048 – 49) 1992	203	(2059 – 60) 2003	26
(2049 – 50) 1993	113	(2060 – 61) 2004	208
(2050 – 51) 1994	260	<b>Average</b>	<b>113</b>

Source: Kunwar, R.M. 2006. Non-timber Forest Products of Nepal

The price fluctuation due to the seasonal supply can be observed in Nepalese markets by NR 5–10/kg for raw material and NR 100–1 000/kg for Jatamansi essential oil. In the national and international market the price of Jatamansi oil is approximately NR 7 000/kg. A price profile of Jatamansi in the Nepalese market is highlighted below.

**Table 17. Price of Jatamansi in Nepalese market, 1950–2006**

S.No	Year	Price in NR/kg
1	1950	Barter system
2	1960	0.25
3	Late 1960	1
4	1970	2.5
5	1980–85	10–16
6	1988–93	20–23
7	1993	53
8	1995	60
9	1997	75
10	1998	83
11	2002	90
12	2003	120
13	2004	140
14	2005	140
15	2006	160

Source: Kunwar, R.M. 2006. Non-timber Forest Products of Nepal

### **B. Government royalty**

According to Forest regulation 1995 Appendix 3 relating to Rules 11 and 25, the royalty rate for Jatamansi rhizome is NR 15/kg.

### **C. Market chain**

According to MoFSC notification (2001), the crude drugs obtained from Jatamansi rhizome are banned for export but the processed extractors are exported after certification and permission. But the collection and trade within Nepal is permissible.



Despite the policy of banning crude drugs, large amounts have been exported without proper channelling. Commercial cultivation of Jatamansi has not been observed yet. Farmers and other collectors directly sell Jatamansi, after collecting it from natural forests, to the local traders or processors. The following chains are common while marketing Jatamansi.

Farmer/collectors --> Middlemen/local traders -->Wholesalers -->Processor/Exporters

Farmer/collectors --> Processors -->Middlemen -->Exporters

Farmer/collectors -->Processors -->Exporters

Farmer/collectors --> Middlemen -->Regional traders -->Processors -->exporters

Farmer/collectors --> Middlemen/local traders --> Illegal Exporters (Exports to India)

## **Socio-economic and Policy Issues**

### **A. Socioeconomic factors**

Jatamansi is usually found far away from human settlements. It takes from few hours to three days to walk to a Jatamansi growing habitat in Kamali region. Collectors take the necessary equipments, extra clothes and food when they go for harvesting. Sometimes they live inside caves during the harvest. After sufficient harvest, they come down with a load of Jatamansi. It takes at least from two to four-five days to make one full load per person. Since Jatamansi grows on cliffs and sloppy mountains, sometimes collectors get injured or face serious accidents during the harvest. Thus collection of Jatamansi is really a hard job. Sometimes the money generated from Jatamansi is less than its labour cost. If the Jatamansi collection is done from nicely growing and virgin areas then the money generated by selling Jatamansi is higher than the labour cost. Sometimes collectors get money in advance from wholesalers or village traders. The money generated from the sale of Jatamansi is utilized to buy clothes, food and other household items. However, farmers are not interested in the cultivation of Jatamansi in their farmland. Most of them have limited knowledge on reproduction techniques. Apart from that the District Forest office (DFO) does not discriminate cultivated Jatamansi from wild Jatamansi in royalty collection and other bureaucratic procedures.

### **B. Government Policy on Collection, Processing, and Trade**

#### **Current policy:**

It is necessary to get a collection permit to collect Jatamansi in natural forests from the respective district forest offices. The interested collector should apply to the DFO or if there is a CFUG they should apply there stating the collection site and the quantity to be collected. But in real practice collectors never obtain the collection permit before collection. Traders have to release the permissions which they acquire after paying a royalty of NR 15/kg to the DFO. Without releasing the permissions nobody is allowed to take away Jatamansi from the district of origin. It is banned for export in crude form. Thus export is permitted only for processed products, oil or marc.

#### **Policy constraints:**

After paying a royalty to the DFO, traders are legally allowed to take Jatamansi away from the respective district of origin within 15 days. During this period, if traders do not manage to arrange air transport or any other kind of transportation, they have to extend again the date with the approval of the DFO. Thus most of the traders oppose to this system. Since it is a banned item for export in crude form, traders who cannot pass the

material through the Indian border are compelled to sell it in Nepal. Marc (residue left of processed Jatamansi) of this plant is allowed for export if the oil content level is below 0.35 percent. However, the Department of Plant Resources has recently authorised government offices not to issue permissions to export the Jatamansi marc even if its oil content is below 0.35 percent. There is no clear policy regarding the export of Jatamansi marc. As a result, raw Jatamansi as well as its marc is being smuggled abroad through the Nepal-India border.

## Key Opportunities and Threats

Jatamansi is one of the most valuable non-timber forest product. There is a higher possibility to enhance the economic conditions of local people by involving them in Jatamansi cultivation, processing and trade, etc. In remote areas of Nepal Jatamansi cultivation would be one of the promising income generation activities for local communities.

If there is no demand from the international market for Jatamansi oil, no trading will happen. The market price may fluctuate from year to year. Transportation of these products depends solely on airlifting in remote areas where there are no motorable roads. The selling price of the raw material at the collection area is affected by the price in India. Apart from its price fluctuation problems it also has a high risk of adulteration. Roots of *Valerian* and *Cymbopogon schoenanthus* and *Selinium tenuifolium* have been found as adulterants of Jatamansi (Edwards, 1996).

## Enterprise Modalities and a Case Study

### A. *Humla Oil Private Limited, Humla*

Humla Oil Pvt. Ltd (HOPL) was established in 1994 to process Non Timber Forest Products (NTFPs) in Humla in order to capture additional value for the communities that use and maintain the natural resources. HOPL is community-owned and operated with the technical and financial assistance provided by the Biodiversity Conservation Network (BCN), Asia Network for Sustainable Agriculture and Bioresources (ANSAB) and Appropriate Technology International (ATI) through the Humla-based NGO, Humla Conservation and Development Association (HCDA). HOPL is processing selected NTFPs into essential oils using simple distillation (water-cum-steam). In addition to processing, HOPL also:

- (i) provides incentives for sustainable harvesting of individual species required to conserve biodiversity as well as to sustain long-term viability of the processing enterprise; and
- (ii) increases the community control over the management of raw materials by providing greater economic returns to the community members who participate in sustainable harvesting groups.

All attempts are made to assure that the operation of Humla Oil Pvt. Ltd. is sustainable from a biological standpoint. The company was established within the context of biological, socio-economic and enterprise goals set out in the BCN programme. Sustainable harvesting practices have been put in place through the institutionalization of a community resource management system in most of the areas from which NTFPs are collected. Collectors are getting competitive prices for raw NTFPs and communities are getting additional money from royalty payments. Previously, royalties went to the central

government. Another strategy adopted by the company for promoting sustainable harvesting is targeting markets that demand environmental, social equity and high quality standards for products. With assistance from ATI and ANSAB the company is exploring sales deals with several Indian and European buyers that put a premium on eco-friendly products. HOPL has also established a distribution arrangement with an American company, who will act as the exclusive US distributor of HOPL's essential oil product line, providing valuable market access for HOPL and quickly responding to sales orders from US buyers. These targeted essential oil buyers promote environmental sustainability and equitable distribution of business benefits within communities.

Another issue affecting sustainable operations of local community managed enterprises is access to working capital and effective cash flow management. For such enterprises there is always a problem regarding cash flow as they need a significant sum of working capital to purchase raw materials. ATI and ANSAB arranged for much of the needed capital by establishing a revolving equity fund administered by the HCDA. The main objectives of the revolving equity fund are to assist the people of Humla (individually or in group) to establish business based on the collection and processing of NTFPs and other natural resources. The total capital authorized for this enterprise was initially NR 800 000. Since the people in Humla were very poor and were not in a position to pay the enterprise capital entirely, the enterprise acquired a grant from the BCN projects of ANSAB and obtained the remaining capital from the HCDA equity investment fund. Later, the authorized capital was increased up to NR 10 000 000 to suit the scale of operations needed to increase the profit for the enterprise.

As of July 1998, HOPL has assets worth more than NR 5 000 000 with cash of NR 9 000 000 including receivable and stock worth NR 3 200 000. It had Jatamansi oil stock worth more than NR 2 500 000 in 1998. Despite the fact that the essential oils produced by this company can be used for many different purposes (perfumery, flavouring, medicinal etc.), they are mainly used in perfumery and flavouring purposes in different industries. The communities of the region have hardly any income generation opportunities. When the HOPL started to operate, it created many economic opportunities for the local people. Along with the establishment of HOPL many traders came into the region to expand the NTFP trade. HOPL has provided not only economic benefits but also other benefits to the society. These include conservation education, literacy classes, CFUG formation, inventories of biological and social resources and many more. HOPL has made significant achievements on several fronts. It has provided good herb markets and market information to the local collectors of Humla, developed international markets for Nepalese essential oils, promoted environmentally friendly and socially equitable concepts in the marketing of natural products, provided economic opportunities to poor people in the remote area of the nation.

The establishment and operation of HOPL in Humla indicates that even in remote locations, economic opportunities may be created by making a proper use of natural resources like NTFPs, many of which have high values and low volumes. HOPL expand the production capacity, in terms of number of products and quantities produced gradually as experience was gained but it still has some technological issues to improve upon. It trailed new aromatic plants, and some of them were successfully launched into the market. HOPL still lacks adequate entrepreneurial skills and managerial quality. The

board of directors and staff are guided by the NGO mentality. Those leading the enterprises have several engagements and interests, which HOPL alone cannot fulfil. Their capacity to make appropriate financial, managerial and marketing decisions needs improvement.

Several issues relating to NTFP regulations have affected the enterprise operation and its effectiveness. The question of equity has to be addressed carefully. The elites in the community have a greater chance of capturing the benefits despite the intention of the projects. For low income members and communities, there may have to be a provision for grants or subsidized prices for the shares through specifically designed programs. Community based enterprises should be given added incentives through regulatory and fiscal measures as compared to free traders and provided with appropriate marketing information and capacity building training within relevant projects and organizations. The following are the lessons learnt from the case study of HOPL:

- Prices for community collectors can be increased; by having support, agencies introduce competition.
- In order to cut out middlemen and develop new products for export markets, strong management capacity and favourable regulations are needed.
- The volume of stock is important in order to command a better price in existing markets.

## **WINTERGREEN (DHASINGRE)-GAULTHERIA FRAGRANTISSIMA**

### **WALL**

#### **Introduction**

*Gaultheria fragrantissima* is an evergreen shrub growing up to one meter high. It is in leaf all year, in flower from April to May. The flowers are hermaphrodite (have both male and female organs) and are pollinated by insects. The plant prefers light (sandy) and medium (loamy) soils. The plant prefers acid and neutral soils and can grow in very acid soil. It can grow in full shade (deep woodland) or semi-shade (light woodland). It requires moist soil.

#### **Biology**

##### **A. Taxonomy**

**Family Name**

Ericaceae

**Local Name**

Dhasingare, Machino, Patpate, Kolomba (Nepali); Payong, Chele (Sherpa); Chenjuwa (Tamang)

**English Name**

Wintergreen

It is a robust shrub with ovate to lanceolate evergreen leaves and with numerous auxiliary spike-like clusters of small fragrant white or pink globular flowers. Flower clusters 2.5-8 cm long, shorter than leaves; flowers short-stalked; corolla 4 mm by 3 mm broad. Leaves acute, 5-10 cm long, smooth above, dotted with the bases of bristles beneath,

margins bristly-toothed; a branched shrub to 1-1.75 m. fruit 0.6 mm, with dark violet-blue fleshy pointed calyx-lobes.

#### **B. Conservation status**

Threat is not known. Not vulnerable. Commonly found and collected.

#### **C. Distribution**

This plant is native to North America and is found in woodland and exposed mountainous areas. It is distributed in the Indian subcontinent from South East Tibet to Burma ranging from 1 500 to 2 700 meter altitude. It is very commonly found as wild vegetation in Nepal in the same topographical range.

#### **D. Ecology and habitat**

Dhasingare is a fast growing, evergreen robust shrub which can grow in areas having rainfall up to 700–1 000 mm. It grows densely in the degraded, open and moist slopes especially in newly cut slopes. Dhasingare can grow in forest and shrub land, mostly in moist area. Dhasingare is covered with fragrant white flowers blooming in the months of April–May. The leaves and fruit are gathered in summer.

#### **E. Regeneration**

The plant has good natural regeneration capacity. The old plants, which are never harvested have slender branching, containing few leaves and the harvested plants attain spreading branches with more leaves. The roots have the unique physiological capacity to extract nutrients from the stony soil and hold the water.

### **SUSTAINABLE RESOURCE MANAGEMENT**

#### **A. Management System**

Dhasingare is mostly found in the natural forests of the mid-hills (Bhocha, Lakuri, Thulopatal, Junghu, Jhakhu, Suri, Chankhu, Marbhu, and Bulungha VDCs) and some are collected from private lands; artificial regeneration (cultivation) has not started yet. People are well aware about the conservation of this species found in community forests and private lands because of its utility. There is no management plan for the development of Dhasingare. There is an immediate need to undertake a resource inventory of this species to draft a management plan according to sustainability principles

#### **B. Harvesting**

Harvesting of Dhasingare starts after 5– 6 years since plantation and sustains for many years. For harvesting, villagers cut the twigs with leaves of 5–6 year old plants with the help of a knife. A child can harvest hardly 40 kg of fresh leaves and small twigs per day but an adult is able to collect twice more. The local processors of Dolakha district give NR 1 per kg of fresh leaves and small twigs to the harvesters. The leaves of Dhasingare are harvested during the whole year.

#### **C. Sustainability issue**

Immature overharvesting of Dhasingare carried out in the studied area lead to a decline in the existing natural resources of this species.

## Uses

### A. Indigenous

People have used this plant as an alternative source of fodder and cattle beds for the dry season since immemorial time. The ripe fleshy berries in dark violet-blue colour during the months of May-June are also eaten by the children.

### B. Commercial

The most useful and valuable part of the plant is the leaves, which are dark green in colour and yield 0.3 to 0.9 percent of yellowish essential oil, the well known “wintergreen oil” in commerce. The essential oil of this plant contains methyl salicylate 95–97 percent, widely used in modern and Ayurvedic medical science for cosmetics products, flavours and medical preparations including toothpaste or massage. Hence, it has a good commercial importance and value. Wintergreen oil is used as a flavouring agent in the confectionery industry and in the manufacturing of soft drinks as well as in the pharmaceutical and perfumery industry. It is used in the form of liniments or in the form of ointments for acute rheumatism, muscular aches, sprains, headaches and sciatica.

## Marketing

### A. Production Volume, trade and market price

Dhasingare is predominantly found in the following VDCs of Dolakha District: Bocha, Gaurishankar, Lamabhar, Orang, Chilanka, Khapachagu, Bhiglu, Jiri, Shayama, Mali, Thulopatal, Laduk, Bulung, Lapilang, Lamidada, Sailungeshowr, Dhudhapokhari, Katakuti, Magapouwa, Bhusapheda, Dadakharka, Lakuridada, Khare, Junghu, Suri, Chankhu, Kalenchowk, Jhaku, Marbhu, Kshamawoti, Jhaphe, Jhule, Gaurinudi, Mirghe, Khestrapa, Kabre, Pawati, Phasphu, Chayma, and Hawa. Dhasingare can be harvested all round the year. About 2 000–3 000 kg of raw Dhasingare are collected/household/season by Chamawati and Thanksa deurali CFUGs, about 500 kg by Lakuridada CFUGs and about 400–500 kg by Deuralipakha and Pandit CFUGs of Dolakha district. An overview of the price structures including selling prices, expenses and margins for wintergreen oil is given below.

**Table 18. Margins, Prices and Expenses by Major Actors for Wintergreen Oil**

Actor	Margin per kg	Selling price per kg	Expenses per kg*
1 Harvesters	312	312	0
2 Local Processors	76	700	624: Made up of wintergreen (312), conservation fee paid to CFUGs (62) & oil processing cost (250)
3 District Traders	80–130	800–850	720: Made up of wintergreen oil (700), handling and packaging (10), transportation to KTM (10)
4 National Traders (domestic sales)	90	950	860: Made up of wintergreen oil (800), storage, repackaging and quality test (60)
5 National Traders (export sales India)	340	1400	1060: Made up of wintergreen oil (800), storage, repackaging and quality testing (60), export permit and certification (200)
6 National Traders (export sales US & Europe)	540	1700	1160: Made up of wintergreen oil (800), storage, repackaging and quality testing (60), export permit and certification (300)

Source: Field survey and information obtained from HPPCL and HBTL, 2005. USAID: FRAME of Natural products in Resource Management, Poverty Alleviation, and Good Governance. \*It takes 250 kg raw Wintergreen to produce one kg of Wintergreen oil. A harvester earns from NR 1 to NR 1.5 per kg of raw Wintergreen or on average NR 1.25  $\times$  250 = NR 312 per kg oil equivalent. Expenses do not include time invested by the actor, with the exception of distillation workers salaries for local processing.

The average annual income from Wintergreen varies among harvesters depending on their household labour availability and socioeconomic condition. The relatively low number of traders and exporters nationwide has resulted in both perceived and actual price fixing with further accusations that rich traders collude on prices and dominate smaller players. Processors and marketing cooperatives are not sufficiently motivated to establish new wintergreen processing units due to stagnant market prices and monopoly price fixing by HPPCL, the one national trader. Table 19 shows information regarding the harvesting and biological capacity status of wintergreen in Nepal on the basis of available secondary data and discussions held with different stakeholders.

**Table 19. Harvesting and Biological Capacity Status of Wintergreen in Nepal**

Districts	No. Of Harvesters	Annual Harvested Quantity (Average last 5 years)	Annual Production Capacity kg/year (Estimated)
1 Solukhumbu	0	-	400 000
2 Sankhuwasabha	0	-	30 000
3 Panchthar	0	-	7 000
4 Okhaldhunga	0	-	150 000
5 Ilam	0	-	50 000
6 Ramechhap	100	100 000	400 000
7 Sindhupalchok	50	75 000	200 000
8 Nuwakot	0	0	400 000
9 Rasuwa	0	0	300 000
10 Dolakha	200	160 000	700 000
11 Kavrepalanchok	0	0	300 000
12 Lalitpur	0	0	15 000
13 Dhading	0	0	50 000
14 Makawanpur	0	0	50 000
15 Bhaktapur	0	0	50 000
16 Myagdi	0	0	20 000
17 Baglung	0	0	15 000
<b>Total</b>	<b>350</b>	<b>335 000</b>	<b>1 437 000</b>

Source: Essential oil production chart obtained from HBTL and information from different DFO, 2005. USAID: FRAME of Natural products in Resource Management, Poverty Alleviation, and Good Governance.

### B. Government royalty

According to the Forest Regulation 1995 Appendix 3 relating to Rules 11 and 25, the royalty rate for *Gaultheria fragrantissima* leaves is NR 11/kg.

### C. Market chain

Mostly, villagers sell their raw products directly to local processors and local processors supply processed Dhasingare oil to Herbs Product and Processing Co. Ltd (HPPCL). Sometimes, villagers sell their products to local traders and local traders supply raw products to local processors. Local processors sell their processed essential oil to HPPCL. HPPCL exports the wintergreen oil to the Indian market and others abroad.

Collectors- -> Processors --> exporters  
Collectors --> Local Traders --> processors -> exporters

## **Socio-economic and Policy Issues**

### **A. Socio-economic factors**

Dhasingare is one of the important sources of income for rural people. Mostly disadvantaged people and farmers with low land holdings are involved in the collection and trade of Dhasingare. Mostly children, women and shepherds collect Dhasingare in their leisure time.

### **B. Government Policy on Collection, Processing, and Trade**

#### **Current policy:**

It is necessary to get a collection permit to collect Dhasingare from natural forests from the respective District Forest Office (DFO). The interested collector should apply to the DFO or if there is a CFUG they should apply to it stating the collection site, method, objective of collection and the quantity to be collected. But in real practice collectors never obtain a collection permit before collection. Collectors sell the product to village traders/local processors. Forest personnel have the power to conduct searches, impound goods, undertake arrests, conduct investigations and file cases.

#### **Policy constraints:**

Several unnecessary check points from the district up to the border are the main constraints, which are responsible for harassing traders. Therefore, the marketing channels of Dhasingare are quite complex and on the other hand there is lack of marketing and price information regarding the collection and production level. Neither the government nor other institutions produce price information for NTFPs on a regular basis but it is affirmed that such information must be available to help collectors/producers and/or CFUGs maximize their profit margins from NTFPs. Irrational royalty fixation and collection, different forms of informal taxes, unnecessary regulatory barriers are the main policy-related constraints.

## **Key Opportunities and Threats**

It is a good source of income for poor and medium farmers of remote areas and can support poverty alleviation among rural people.

There is a limited market for Dhasingare oils, only HPPCL buy Dhasingare oils from the local processors. The fluctuation of the market price of essential oil is one of the risk factors for traders. There is a monopoly of HPPCL in the price fixing process. Problems arise during the transportation and storage process of wintergreen oil from local processing units to HPPCL. Local processors pay unnecessary taxes to different organizations during the trading of wintergreen oils. Regeneration in natural habitats (forest marginal land) is depleting each year. The main reason of extinction is the uprooting of the plant at a pre-mature stage. There is lack of effective conservation practices in the public and private sector.

Dhasingare is one of the important sources of income for rural people. Mostly disadvantaged people and farmers with low land holdings are involved in the collection and trade of Dhasingare. It is necessary to get a collection permit to collect Dhasingare



from natural forests from the respective DFOs. Several unnecessary check points from the district up to the border are the main constraints, which are responsible for harassing traders. There is a limited market for Dhasingare oils, only HPPCL buy Dhasingare oils from local processors. The fluctuation of the market price for essential oil is one of the risk factors for the traders. There is a monopoly of HPPCL in the price fixing process.

## LOKTA-DAPHNE BHOLUA

### Introduction

*Daphne bholua* (Lokta) is an evergreen or deciduous erect or spreading type of shrub, 1–3 meters tall on average but frequently attaining heights of 5–6 m in areas which are not heavily exploited. The leaves are entire, dull green and leathery. The flowers are sweetly scented, white, pink or purplish. Flowering time is usually from December to May depending on altitude and climatic factors. The fruit is an ellipsoid berry about 1 cm long, green at first and then purple or almost black when ripe. It ripens from March to June and each fruit contains a single seed. Two species of the genus *Daphne* are common in Nepal: *Daphne bholua* (including a *D. bholua* var *glacialis*) and *D. papyraceae*. These plants are locally known as Lokta, kagate, kagat pate, kagati, baluwa, baruwa, seto balua and kalo balua in different parts of the country. The inner bark (bast) is used for papermaking which is widely known as Nepali Kagaj. These handmade papers are popular and have high demand in international markets. In this document handmade paper, Lokta paper and Nepali Kagaj are used synonymously.

### Biology

#### A. Taxonomy

##### Scientific Name

*Daphne bholua*  
[Syn. *Daphne bholua* var *glacialis* & *Daphne papyraceae*]

##### Family Name

Thymelaeaceae

##### Vernacular Name

Lokta, Kagate, Kagat pate, Kagati, Baluwa, Baruwa, Seto balua, Kalo baula

#### B. Distribution and habitat

*Daphne bholua* is found in Nepal, Bhutan, China, and Assam, Sikkim, Bangal of Uttaranchal in India. It is found from about 1 800 m up to 3 600 m, and *D. bholua* var. *glacialis* is a deciduous small shrub extending up to about 4 000 m in east Nepal. However, in the west, where annual precipitation is less and the tree line correspondingly lower, it rarely exceeds 3 000 m. It is reported that from western Nepal to Sikkim it replaces *D. bholua* above 3 000 to 3 500 meters. The flowers of *D. bholua* var *glacialis* range from pink to purple, are very sweet scented and appear on bare branches in spring and occasionally in winter. It is usually a small shrub 15–20 cm high (HMGN and UNICEF, 1984).

*Daphne papyraceae* is an evergreen much branched erect shrub 1–3 meters high on average with branches usually 3 cm thick. The leaves are dark green (darker than *D.bholua*), entire, smooth and thinly leathery. The flowers are white or greenish–white. Flowering time starts from October to February. The fruit is fleshy berry about 1 cm long, orange at first and turning deep red when fully ripe. It ripens from April to May. It

occurs from Pakistan eastwards as far as central Nepal and is found between 1 600 m and 2 500 m altitude occasionally extending up to 3 000 m. It is less frequent than *D. bholua* both horizontally and vertically.

*Daphne* species grow slowly as understorey shrubs. *D. bholua* appears more gregariously in the moist conifer and broad-leaved forests of the temperate Himalayas. They generally favour sites with *Quercus*, *Rhododendron*, Hemlock (*Tsuga demosa*) or Fir (*Abies species*) and are also found to a lesser extent in upper mixed broad-leaved forests. They are almost completely absent in forest dominated by Blue pine (*Pinus wallichiana*), Deodar (*Cedrus deodara*) and Spruce (*Picea smithiana*). They prefer medium to light crown cover and usually avoid sites with dense crown cover of more than 70 percent (Dhungana and Khatri-Chhetri, 1995) or large open areas. Plants are found in lesser densities in areas of intense or haphazard exploitation of the forest resources and in areas with frequent fires and heavy grazing. They appear to thrive on a wide range of soil types but generally favour moist sites with a rich organic humus layer overlying well-drained sandy loam or brown earth.

### C. Regeneration

Natural regeneration occurs mainly from seeds and root suckers. It is reported that in natural conditions, Lokta regenerates 25 percent from seeds and 75 percent from root suckers according to a study at a number of sites in eastern, central and western Nepal (Jeanrenaud, 1984). Root suckers arise from an adventitious bud on a root. One of the studies from the eastern region (Dutta, 1994) shows that coppices only occur at young and juvenile stage in vigorous form but are absent or weak in mature stands. Therefore no coppice regeneration was found in stump after harvesting as the plants are harvested in a mature stage to get high quantity and quality of best fibre. Plants should be harvested for its fibre after the seeds are dispersed in the ground. *Daphne* seeds are very attractive to birds, and this may reduce chances of regeneration potential from seeds.

Artificial regeneration of *Daphne* species can be done from seeds, vegetative parts (soft tip or soft wood cutting, semi-hardwood cutting, hard wood cutting and root cutting), layering and grafting. In Nepal, methods from seeds and hardwood cuttings have been tested in small scales. Cuttings are made during winter months and raised in a nursery and later in the site. Till now emphasis has been given to natural production. There are very few successful case stories of producing seedlings from seeds but success has been demonstrated through cuttings in small-scale nurseries at Dandapakhar and Sindhupalchock).

The plant is more susceptible to external injuries like fire and grazing. These factors should be controlled for the establishment of seedlings either from natural or artificial methods. To minimize loss of seeds from birds, prompt harvesting is essential and is encouraged. Artificial regeneration is quite hard since *Daphne* needs unique ecological requirements (mainly in terms of managing appropriate shade, associations, and soils). *Daphne*, as a shade demanding understory species, is dependent on the forest ecosystem for its habitat. Pilot research is necessary to determine the optimum artificial shade required for the growth of artificial stands of *Daphne*.

## Sustainable Resource Management

### A. Management system

There is a lack of information on the existing stock levels of Lokta (as well as other species of NTFPs) in the district level agencies including the District Forest office (DFO). Because of this, organizations face great difficulties in developing strategies for sustainable harvesting and management. There rarely exists a practice of resource inventory by Community Forest User Groups (CFUGs) and DFOs prior to issuing licenses for bark collection. This is one of the reasons contributing to the exploitation of the resources. DFOs and the CFUGs depend mostly on information furnished by collectors and local level traders for some traded NTFPs, including Lokta. In order to ensure the sustainable management system of the resource, DFOs and CFUGs should have adequate relevant information on resources.

Resource inventory should be made mandatory prior to harvesting so that site-specific information can be generated, and this could form a basis to design the optimum harvest level. There are very few cases/patches of forest where inventory data are available to justify and ensure that harvesting practices are within sustainable limits. A few innovative cases of innovative resource assessment and design of sustainable harvesting exist in the case of Lokta. For instance, Binayak Pimidanda community forest, Bajhang and Bongkhani community forest of Baglung have been assisted by ANSAB to prepare sustainable harvesting strategies for Lokta using data collected from detailed resource assessment and a sustainability analysis.

### B. Harvesting

Harvesting is carried out on an ad hoc basis with techniques varying from district to district. In some places the bark is stripped down to the rootstock and severed at ground level (thus almost completely destroying the meristematic tissues and precluding the emergence of coppice shoots but probably encouraging vigorous root suckers). However, in some areas the whole plant is uprooted, a practice which is detrimental to the vigorous regeneration from root suckers. To get better regeneration from coppice and root suckers, plants should be cut with a sharp tool at a height of 30 cm from the ground and the bark stripped only from the cut plants. Also, the bark should not be stripped in standing position.

Bark is usually harvested during the agricultural slack season following the festival of Dashain i.e. from the end of September or mid-October continuing into late spring to mid-May (Kartik to Jestha) with a two months' break in the coldest months from mid-December to mid-February (Paush and Magh), (Jackson, 1994). Winter cutting is discouraged as a significant portion of bast keeps sticking to the stem during harvesting. Lokta grows in a quite uneven-aged structure in its natural condition. The use of a blocking system may not be an effective solution for harvesting, as there are plants of varied age and size in the same block. To allow harvesters to extract barks of appropriate size classes from plants, some rules have to be prepared and enforced, specifying areas, size and quantities of uptake.

Several researchers have reported that *Daphne* seeds have extremely short viability. It may be that more precautions and care are needed while handling the seeds during collection and they should be sown in a nursery immediately after collection. The soft

fleshy outer covering should be removed before sowing. It takes from three weeks to a month to germinate.

## **Uses**

### **A. Indigenous**

Traditionally, Lokta leaves were used as a fodder for goats and bast fiber as cordage. The history of papermaking as a rural-based cottage industry in Nepal can be traced back to at least the 12<sup>th</sup> century A. D (HMGN, UNICEF, 1884; Jeanrenaud, 1984). Over this period of time, the industry has grown substantially and is a source of income for about 1 500 poor families living in remote areas of the country (Forestry Sector Master Plan, 1988). In the 1960s, Nepali Kagaj was still in extensive use as it was the cheapest form of paper at that time in Nepal. At present, however, with the influx of several competing modern and yet cheaper types of imported papers, Nepali handmade papers find limited users in the country. In spite of comparatively higher prices, Nepali Kagaj is still used in Nepalese courts for all purposes, for special documents in other government offices and for wrapping the incense used in most of the worshipping functions in Nepal.

### **B. Commercial**

Nepali Kagaj is made mostly by local small-scale farmers in the remote districts of Nepal. The traders/ processors in Kathmandu generally order Nepali Kagaj from these small producers of the size of 20 by 30 inches. They use the sheets of paper as raw materials to produce different types of end products, and export to several countries. Few of these products are sold in Nepal. According to some leading entrepreneurs, key products made from Nepali Kagaj include books, letters, documents and manuscripts, single leaves for magical and ritual purposes, woodcuts, written slips and ritual cards, horoscopes, fortune-telling cards, painting, masks, festival decorations, wrapping papers, ceiling coverings lining and backing sheets, wound dressings, headache cures, incense sticks, cartridge, fireworks and kites, boxes, albums, briefcases blotting papers, maps, playing cards, greeting cards, notebooks, notepads, calendars, lampshades, envelopes, writing paper for legal documents, etc. A visit to Bhaktapur Craft Printers (BCP) and Nepal Paper Products (NPP) showrooms confirmed that over 200 items are made and sold.

## **Marketing**

### **A. Production volume, trade and market price**

Goods made from handmade paper are popular mainly in the international market. Longer durability, unique pattern and texture, rarely available in other parts of the world, and its cultural attachment to the host country are the main characteristics of the products that attract international buyers. All the materials are exported as finished products. A very small amount of products is sold within the country, and even this small amount of domestic demand comes from tourists.

According to the monthly bulletin published by the handicraft Association of Nepal (2004), Lokta-made products are exported to 47 countries in the world directly from Nepal. Among them the United States is at the forefront, followed by France, the United Kingdom, Japan, Germany, Switzerland, Canada, Australia, India, Italy, Hong Kong, Spain, the Netherlands, Denmark, Austria, Sweden, Norway, Taiwan, Korea, Belgium, Singapore, Czechoslovakia, Hungary, Brazil, Ireland, Tibet, Finland, Greece, Portugal, Thailand, New

Zealand, S. Africa, Chile, Cyprus, Slovenia, Argentina, UAE, Russia, Malaysia, Israel, Croatia, Mexico, Bangladesh, Indonesia, Poland and others.

There are two main categories of final products prepared from handmade paper: a) cards, and b) stationary. Under these two categories there are more than 200 items of final products. Most of the papers are produced in high altitude areas near the resources. Small-scale local producers make Lokta paper individually or in groups. Community Forest User Groups (CFUGs) too have started to produce paper at local level. In some cases, relatively richer people produce in bigger scale as their main business. Both scales of papermaking are in existence in different parts of the country. Bundles of papers are then brought to Kathmandu where they are taken as a raw material for producing finished products for export purposes.

Prices vary in different locations mainly depending on the extent and type of transport facilities to the market, paper quality, supply quantities and bargaining power of the contractors and local producers. According to the Traders Survey (2004), the quantity of Lokta that arrived to the market in the fiscal year 2002/2003 on two marketing centres Khadbari and Basantapur was 8 500 kg and 7 500 kg along with the collected royalty of NR 25 500 and NR 22 500 respectively. In the fiscal year (2064/65) the quantity of Lokta that arrived to the market in Panchthar district was 11 000 kg and the collected royalty was NR 22 000. According to Dutta (1994), the price was NR 500 for one Kori of paper (200 sheets) in the Basantapur area of Terhathum district in the fiscal year 1993/1994. Likewise the maximum price obtained in 1995 was NR 400 per Kori in Sankhuwasabha district (Dhungana and Khatri- Chhetri). The price in Kathmandu ranges from NR 1 000 to NR 2 000 per Kori. The prices in Kathmandu are usually higher than in the Districts of origin because local level contractors have to pay a royalty to the District Forest Office (DFO), taxes to local government bodies, transportation and service charges to contractors (Olsen and Helles, 1997)

### **B. Government royalty**

Forest Regulation 1995, Section 3 and its amendment 2005 describe government royalties for different medicinal plants according to which the royalty for plant parts of *Daphne* is NR 3/kg. There are a number of anomalies in the government's revenue policy dealing with NTFPs.

### **C. Market chain**

Handmade papers are made in remote hilly areas by local poor farmers even at household level, individual entrepreneurs at large scale and then these papers are bought by local level contractors. These contractors either sell to regional contractors or sell directly to the processors in Kathmandu. Processors in Kathmandu use these papers as raw material, produce different kinds of products and export them to the international market for end users. Mainly the following kinds of market channels within the country are in place.

Bast collectors --> Paper producers --> Local level contractors --> Regional contractors -  
-> Processors

Bast collectors/paper producers --> Regional contractors --> Processors

Bast collectors/paper producers --> Processors

## **Socio-economic and Policy Issues**

### **A. Socioeconomic factors**

Priorities should be given to handover the forests with a Lokta area to the local communities as far possible, which not only supports a sustainable management of resources because of ownership rights but also helps to enhance the economic condition of local communities. However, the people (local communities) who are involved in the preparation of Nepali Kagaj accrue only a small share of the final price. The major share of the benefits goes to the middlemen, wholesalers and exporters. The main causes behind getting lower benefits are the excessive use of human labour and the poor quality of papers.

Strengthening of local level entrepreneurship is a viable way towards enhancing benefits at local level. There are many value-added products, which can be made by the local people with small guidance and simple training. From this, local people can benefit from earning direct cash from the finished products and employment is generated at local level. This sort of arrangement could motivate local people to manage the resource more sustainably in the long run. Preparing products at local level and exporting them by a national level exporter may help and justify exploring other new markets in the world.

### **B. Government policy on collection, processing and trade**

#### **Current policy:**

The DFO can issue a permit/license for Lokta bark collection from national forest, whereas CFUGs can do so in the case of community forests, provided there exists an operational plan authorizing it. For the transportation of barks or paper outside the district, a transit permit should be obtained from the DFO. For export, a certificate of origin should be obtained from the Federation of Nepalese Chambers of Commerce and Industries (FNCCI). In the case of a Lokta product (since it is made by hand), it should be recorded at Handicraft Association of Nepal for final evaluation in Nepal, before export.

NTFPs are harvested from the land under five forms of tenure: community forests, leasehold forests, government-managed forest, private land and protected areas. All forests within the kingdom, excluding those on private land, are national forests owned by the Government of Nepal. These include areas handed over to forest user groups for management. National forests, besides those that are obviously tree-covered, include wasteland and uncultivated areas that are surrounded by, or adjoining, forests. These additions are relevant to the management of NTFPs because products are often harvested from land with little tree cover. All products pass through a number of check posts between the road-head and the Indian border. These check posts are variously staffed by different government ministries. For NTFPs, and in each district, there are one or more check posts where royalties are collected for that district. There are also posts staffed by the Department of Forests that inspect the collection permit and release order.

#### **Policy constraints:**

There are a number of anomalies in the government's revenue policy dealing with NTFPs. In practice, the royalty mechanism is used to generate funds for the Ministry of Finance. The Department of Forests does not benefit directly and is unable to channel

the revenue into the development of the sector. This policy does not encourage sustainable harvesting from government-managed land and may effectively discourage attempts to cultivate or manage NTFPs on community forests or private land. Thus the policy on the royalty system provides no preferential incentive to cultivate on private land or manage common property. NTFP revenue collection is thought by many to be inefficient and corrupt. However, it has yet to be demonstrated that the present system has a marked negative impact on the sustainability of harvests.

Export bans increase the opportunities to corrupt the numerous officials who have authority to check the produce between the hills and the Indian border. Enforcement of the ban is not made easier since there are few restrictions to import these products into India. Government policy reduces the income of harvesters through both the collection of royalties and bans on collection and export. The effect of lower income is unpredictable. However, government policy is only directed towards short term income generation rather than improving management.

### **Key Opportunities and Threats**

Harvesting *Daphne* bark and local paper manufacturing have considerable potential for generating employment and providing income in hill areas, and therefore various national and international organizations have cooperated with the Government of Nepal to promote the handmade paper industry. However, resources need careful management in order not to be exhausted by over-exploitation. So far artificial regeneration of *Daphne* has been confined to experimental work, but it may become important to supplement the natural supplies of bark.

Another factor to be considered in connection with handmade paper manufacturing is that the process requires large quantities of fuel wood to cook the paper pulp and to dry the paper. This is estimated at 3 kg fuel wood for 1 kg of paper, much more than this if wood ash, rather than caustic soda, is used in the digestion process. Thus in addition to regulating the harvest of *Daphne* it is necessary to make provisions for fuel wood supplies. To produce the quantities of fuel wood needed it is likely that the management of natural forest will have to be supplemented by plantation in some areas. Research carried out to date on the ecology, silviculture and exploitation of the species has served to highlight the need for an integrated approach to manage *Daphne*, a shade demanding understorey species, which are dependent on the forest ecosystem for their habitat and thus their management must be viewed in this wider context.

### **Enterprise modalities and a Case Study**

#### **A. Malika Handmade Paper Private Limited, Bajhang**

##### **(i) Background**

Situated in high mountains of the Far Western Development Region of Nepal, the district of Bajhang is surrounded by Humla and Tibet in the North, by Humla and Bajura in the East, by Darchula and Baitadi in the West, and by Doti and Baitadi in the South. This mountain region is very remote and poor in terms of infrastructural development and the economic conditions of the people living in the area. However, it is very rich in natural resources. Non-timber forest products (NTFPs) are important resources to the district, which can play a crucial role in the economic development of the region. Bajhang has many non-timber products but very few enterprises utilize them at the local level to

generate income for the poorest people of the district. After a preliminary study, a paper-making enterprise ranked top among the products and enterprises evaluated. This enterprise was identified to be a vehicle for generating economic to the community of Kailash and to conserve the resource base and the biodiversity of the region. The existing papermaking enterprises in Bajhang and elsewhere in Nepal are operating in a production-oriented capacity and are not paying much attention to sustainable natural resource management and social equity issues. Demand for this product in domestic and international markets is high in comparison to the current supply situation. This enterprise is expected to help upgrade the economic condition of local collectors by providing opportunities to collect and sell the raw materials.

#### **(ii) The enterprise**

The Malika Handmade Paper Pvt. Ltd. is a community owned handmade papermaking enterprise, which was established at Kailash-2, Hamarsain, Bajhang. The main goal of the enterprises is to provide economic incentives to community members to conserve the natural resource base of this region while generating profits to shareholders for the development of this enterprise in the long run.

#### **Ownership of the enterprise:**

Binayak Pimidanda CFUG and ANSAB Equity Fund Investment Committee own the enterprise. The board of directors comprises representatives from the CFUG Bajhang and the ANSAB Equity Fund Investment Committee. The board has recruited a manager who is responsible for all the operating activities of the enterprise and the chairperson of the board supervises him. The enterprise development and resource management activities have been monitored and supervised by the enterprise development committee and resource management committee.

#### **Marketing:**

There is a huge market for the product (handmade paper) in western countries with an increasing trend. As per the Table of Nepal Overseas Trade Statistics, a total amount of paper worth NR 76 501 864 was exported in 1997/98 (MHPL, 2000). Its demand is increasing day by day. The enterprise offers its quality products to buyers in Kathmandu at negotiated prices. The enterprise is seeking to make an association of paper producers in Bajhang to increase its bargaining capacity. It has a plan to differentiate its products as superior ones in the market of handmade paper and promote its image of an eco-friendly and community concerned enterprise. The enterprise sells its products to wholesalers, distributors or exporters and to printing presses or printers. The enterprise is seeking opportunities to form strategic alliances with various business companies and organizations for promoting its products and the enterprise image. It further explores e-commerce (Internet) for marketing through facilitating organizations such as ANSAB.

#### **Technology and production process:**

The Malika Handmade Paper Pvt. Ltd. produces 20" □ 30" sized paper (MHPL, 2000). It processes the 40 and/or 20 grams paper for the Kathmandu market. Depending on market demand, it adds to its product line ranging from 10 grams to 40 grams in weight (MHPL, 2000). The most profitable product in size and weight holds the major share of production in this enterprise. This enterprise uses a beater machine. To bake the pulp,



the enterprise uses cooking vats. A diesel or kerosene drum was cut and used as a cooking vat because it is cost-effective.

The Malika Handmade Paper Pvt. Ltd. has planned to process 145 kg of dry Lokta bark a day at 100 percent capacity from the seventh year onward and it is expected to operate eight full months in a year to consume 34 800 kg of dried Lokta bark annually (MHPL, 2000). Fire wood is the main source of fuel for cooking the Lokta bark. A fuel-efficient stove is used to reduce the quantity of fire wood consumed. Water force is an alternative source of energy to run the beater machine. By the beginning of the year 2000, the enterprise had started production. It has its own building. It has a beater machine with a capacity of ten kg per hour (MHPL, 2000).

### **(iii) Economic opportunities**

A total number of 217 households own this enterprise through their forest user group and receive the profits generated from it (Binayak Pimidanda CFUG, 1999). They get an attractive price for the collected Lokta and firewood that is primarily used in this enterprise. This enterprise also provides a handsome amount to the forest user group as a forest product collection fee. This enterprise employs local people in papermaking activities and creates employment for many more in seasonal and casual activities. Nearly 500 households in adjacent communities are the secondary beneficiaries of this enterprise and are mainly benefited from the sale of raw materials to the enterprise. Roughly half of the primary and/or secondary beneficiaries in these households are women. The enterprise generates annual income of about NR 1 050 000 for the local suppliers or collectors of Lokta and firewood and about NR 450 000 for direct employees of this enterprise. Other income generating opportunities in the season also exist for the members who transport caustic soda and packaging materials for the enterprise. Assuming that 60 percent of raw materials and 100 percent of fuel wood comes from the primary beneficiaries, a conservative estimate shows per household income for primary beneficiaries (217) increasing by NR 3 225 annually from the sale of Lokta and firewood to the enterprise. If the remaining 40 percent of Lokta is sourced from adjacent communities, per household income for secondary beneficiaries (500) will increase by NR 738.

### **(iv) Natural Resource Management**

The region around Kailash is a suitable habitat for Lokta. There are around 5 000 hectares of Lokta forest in the Malika region, which is a catchment area for this enterprise. The inventory made by ANSAB in 912 hectares of forestland, which is the area for participatory management by Kailash community as community forest, indicates that there are 113 350 kg in stock of harvestable dry Lokta (Binayak Pimidanda CFUG, 1999). Additionally, the area supports more than 1 000 000 small plants (less than 3 cm in diameter, at 30 cm above ground and more than 30 cm in height) and more than 50 000 000 regenerating plants (less than 30 cm in height). If these 912 hectares of forest are properly managed, they can supply more than 20 000 kg of dry Lokta bark on a regular and sustainable basis (Binayak Pimidanda CFUG, 1999). Combining this inventory result with the preliminary participatory resource assessment in Kailash, a total supply of more than 100 000 kg can be estimated in the catchments of this enterprise. This enterprise's share of the supply of total Lokta in this region accounts for less than 35

percent of the total. The enterprise purchases sustainably harvested raw materials from organized collection communities or community forest user groups.

**(v) Observations and lessons**

This enterprise was registered at the Office of the Company Registrar, Kathmandu. It is also essential to register this enterprise at the District Cottage Industry Office (DCI), Bajhang. Due to the absence of regulatory clarity, the DFO finds it difficult to forward the process of registration with the DCI. The lesson from this is that at implementation level, the DFO should be involved in any processes leading to enterprises, and secondly, policy confusions, if any, have to be identified and brought into national debate for revision. The ANSAB Equity Fund has invested fifty percent of the total investment and this is one of the prime factors leading to enterprise development. In the community with the poorest members in the country, financing through such provisions has been critical to the success of the enterprise. This area is endowed with abundant Lokta resources that can supply adequate quantities of Lokta bark in a perpetual manner. This is one of the main reasons for the establishment and operation of the enterprise in the locality.

Acute food shortage is a major livelihood challenge in the area. People are forced to allocate their time to activities that return the immediate food items required. As a result, CFUG members face great difficulties in allocating time to activities that yield cash and other long-term benefits. Papermaking requires sunny days and it is extremely difficult in colder locations. The technical production feasibility (i.e., due to climate etc.) is an important factor affecting enterprise finances.

**(vi) Lesson learnt**

- Integrated participatory planning with users of a resource is needed in order to ensure that raw material supply matches market demand.
- Existing products and existing markets can be successful as long as there is adequate research and planning.
- Clear regulations and coordination between the Ministry of Forest and the Ministry of Industry are important in order for community based enterprise to be formally registered and thereby receive services.

Goods made from handmade paper are popular mainly in the international market. Longer durability, unique pattern and texture, rarely available in other parts of the world and its cultural attachment of the host country are the main characteristics these products that attract international buyers. Priority should be given to the handover the forests with a Lokta area to the local communities as far possible, which not only supports the sustainable management of resources because of ownership rights but also helps to enhance the economic condition of local communities. The DFO can issue a permit/license for Lokta bark collection from national forests, whereas CFUGs can do so in the case of community forests, provided there exists an operational plan authorizing it. There are a number of anomalies in the government's revenue policy dealing with NTFPs. Harvesting *Daphne* bark and local manufacture of paper have considerable potential in generating employment and providing income in hill areas. The Malika Handmade Paper Pvt. Ltd. is a community owned handmade papermaking enterprise.

The main goal of the enterprise is to provide economic incentives to the community members to conserve the natural resource base of this region while generating profits to shareholders for the development of this enterprise in the long run.

## **SISSOO-DALBERGIA SISSOO ROXB. EX DC.**

### **Introduction**

*Dalbergia sissoo* is one of the most important multipurpose tree species for planting in the Terai and lower elevation of Nepal. It is one of the most potentially valuable species for afforestation at lower altitudes, in the Terai, Bhabar Terai and Duns. It is a useful multipurpose tree, producing fuel wood, timber and fodder, and is the most widely used fodder species in the Terai. Over 90 percent of the seedlings taken from the community forestry nurseries in the Terai, for planting by farmers, are *Dalbergia sissoo*. It is an erect tree; bark longitudinally furrowed; leaves alternate, odd pinnate (3 or 5), ovate; flowers creamy white in axillary panicles. It has multipurpose uses.

### **Biology**

#### **A. Taxonomy**

Scientific Name	<i>Dalbergia sissoo</i> Roxb. ex DC.
Family Name	Leguminosae
Local Name	Sisau (Nepali); Sisau (Newari); Shimshapa (Sanskrit); Sisau (Gurung); Siso (Tamang).
English Name	Sissoo tree, Indian Rosewood

#### **B. Distribution**

It is characteristic of alluvial soil adjoining rivers, often associated with *Acacia catechu*. In Nepal it grows up to 1 500 meters. Its general distribution is in the Indus, Ganges and Brahmaputra river systems including their tributaries, from Afghanistan to Assam. Away from these river systems its range has been greatly extended by planting.

#### **C. Ecology and habitat**

It is a large deciduous tree, growing up to nearly 30 meters on favourable sites; the bole is very often sinuous. Its best growth is found where there is a water table within 8 meters from the surface which the roots can reach, including bouldery alluvial soils near rivers. In Nepal it grows well on Bhabar Terai soils provided the water table is high enough. It will however grow on a variety of other soils, but with much poorer growth rates. It is a strong light demander, and best development of seedlings is found in full light. The seedlings rapidly develop long tap roots, which may reach a length of 1–1.5 meters in the first year. Seedlings are particularly sensitive to competition by grass and weeds. It has some resistance to frost. Seedlings in the cotyledon stage are killed by it, but older seedlings will tolerate mild frost and larger trees are not seriously injured, not even by severe frost. It is not very fire-resistant; seedlings and pole-sized trees are killed by fierce fires, including fires in tall grass, and even large trees are damaged. Young trees are very liable to damage by browsing. *Dalbergia sissoo* coppices and pollards freely and produces abundant root suckers, especially if the roots have been injured. Its roots nodulate and fix nitrogen.

## D. Regeneration

### Natural regeneration:

Abundant seed is produced nearly every year. The pods fall complete with seeds between December and March, and lie on the ground until sufficiently moistened by rain or river water to germinate. Dispersal is mainly by flood water, and so in nature *Dalbergia sissoo* tends to be mainly found near rivers. Some wind dispersal, however, occurs, and regeneration may also be found on land slips and abandoned cultivations. For the seedlings to establish full light, permeable soils, freedom from weeds, and water within the range of the growing roots are required. These conditions are found par excellence on new sand bars and shingle banks, on which even-aged stands develop. Natural stands may be kept down to dense low bushy growth by grazing. After protection these may recover by re-growth from coppice and root suckers.

### Artificial regeneration:

Seed is produced abundantly nearly every year. The pods ripen between December and March; seeds should not be collected until the pods have turned brown in colour, and the pods should be collected from the trees not from the ground. One tree on average produces 1–3 kg of pods. However it is not necessary to extract the seed from the pods, which can be broken into one-seeded segments and the segments can be sown as they are. The pod segments, after being dried in the sun for several days, can be stored under field conditions for a year in scaled plastic bags, though under the heat conditions of the Terai they may lose about half their viability during this period. For longer storage, refrigeration is desirable, provided it is reliable. The broken pods should be soaked in water for 48 hours before being sown. Germination of soaked seed is usually fairly rapid, between one and three weeks, and a 60–80 percent germination rate can be expected. Temperatures below 20 °C and above 35 °C reduce germination (Kumar and Bhattnagar, 1976). One kilogram of pods should produce 3 000–6 000 seedlings. The seeds after been soaked in water are placed in a layer about 15 cm deep, covered with grass or sacking, and well watered. The seeds are picked out and sown as they germinate.

Within the last ten years Dr S.B Rajbhandari has succeeded in raising sissoo plants on a large scale by tissue culture (Rajbhandari, 1988). This technique, combined with the use of cutting, raise interesting possibilities of creating plantations of elite trees on a large scale.

## Sustainable Resource Management

### A. Management System

So far few plantations have been old enough for thinning to be needed. K.J.White (1988) recommends, for better growing plantations on a short rotation, thinning to 400 stems per ha at the age of five years, and felling the remainder at the age of ten years. An alternative would be to retain 100 stems per ha at the age of ten years, thus converting the stand to coppice with standards. Of course the actual thinning would depend on the growth of the trees. However Sissoo is sensitive to inter-tree competition and relatively heavy degrees of thinning are advisable. A trial at Adhabar of growing Sissoo in mixture with *Eucalyptus camaldulensis* resulted in the growth of the Sissoo being reduced by competition from the Eucalyptus. Some trials have been made of pollarding the trees in plantations. When a thinning is due the trees to be removed can be pollarded, rather

than being coppiced by cutting at the base. Pollarding has the advantage of removing the young growth from browsing by domestic animals.

### **B. Harvesting**

Two streams of Sissoo harvesting are prevalent in Nepal. The first is the crude, manual harvesting by groups of people. The other is through government agencies. The harvesting techniques are labour intensive and only slightly more mechanized than those used by the people or groups. Hand saws and axes are used for felling, delimiting and cross cutting. Bullock carts are used to bring the logs to depots, from where they are loaded manually onto trucks that take them to the mill. At present there are no industrial plans that require a large volume of logs over short periods. It is therefore unlikely that timber harvesting techniques will change much, except for the introduction of better hand tools. In the central Terai the main harvest period is in the pre-monsoon period from mid-April to mid-June, but harvest continues through the monsoon period until mid-December (Mangsir).

### **Uses**

Sissoo produces a strong, elastic timber, though due to the shape of the bole long straight logs are difficult to obtain. The heartwood is very durable, but the sapwood is attacked by borers. The heartwood is brown with darker streaks, and is used for building, furniture, cart wheels and tool handles. It is an excellent fuel wood; according to Gamble, good pieces burn 'almost like coal'.

It is a valuable fodder tree. The leaves have an average crude protein content of 15–16 percent with a digestibility coefficient of about 56 percent but the crude protein content varies considerably, being higher in young leaves than in older ones. The leaves and roots are used medicinally. The tree is an excellent source of honey.

### **Marketing and Finance**

#### **A. Marketing information**

Sissoo is found from east to west of the Terai region of the country. Major Terai districts of Nepal have been involved in the trade of Sissoo. The major trading centres districts are Jhapa, Morang, Sunsari, Siraha, Saptari, Dhanusa, Mahottari, Rautahat, Sarlahi, Bara, Parsa, Udaypur, Makawanpur, Chitwan, Nawalparasi, Rupandehi, Kapilvastu, Dang, Banke, Bardiya, Kailali and Kanchanpur. The quantity of Sissoo supplied for the district depends on the price. If there is a good price the quantity automatically increases if the price is not high the quantity of supply decreases. The market price of Sissoo varies in different regions of the country depending on its availability, transportation costs, operation costs, etc.

The supply of this forest product (Sissoo) depends on management regimes, forest policies and the cost of production. The Department of Forest (DoF), the District Forest Office (DFO) and its Illaka (Unit) Ranger Office under the Ministry of Forest and Soil Conservation (MoFSC) are responsible for the operation, conservation, development, administration, management and marketing of the state-owned forest of Nepal. The other types of forests are the Community Forest, the Leasehold Forest and the Private Forest which are operated and managed by the Forest User Group (FUG), individuals (below the poverty level) and private citizens respectively. Community and Leasehold

forest though owned by the government (ownership under the government is purposely kept to control and check them in case they deviate from the objective envisaged) they are operated and managed to meet their basic needs of fuel wood, fodder and timbers. Private forests are operated, managed, developed and conserved by private owners and these supply the forest products for their own use, wood mills and markets. A supply of forest products to the market from the Community and the Leasehold forest has not been noticed except to meet their basic needs. Only the state-owned forest supplies fuel wood and timber to the urban market of Nepal and also to wood-based industries.

In the case of the state owned forest, official harvesting of logs (Sissoo) and fuel wood transportation is handled by the District Forest Product Supply Committee (DFPSC) under the Ministry of Local Development (MoLD), the Timber Corporation of Nepal (TCN) under the Ministry of Supply (MoS) and the District Development Committee (DDC) under the MoLD. The Forest Production Development Board (FPDB) under the MoFSC supplies fuel wood and timber from Sagamath (Sarlahi district), Ratuwamai (Jhapa) and Nepalgunj depots.

#### District Forest Product Supply Committee (DFPSC)

This is an ad hoc committee created through a special decision of the cabinet in 1991. This committee is responsible for supplying timber and fuel wood for small construction purposes, local development activities and in subsidized rates for the people suffering from natural calamities like floods, earthquakes, and agriculture implements.

#### Timber Corporation of Nepal (TCN)

TCN is a state owned parastatal corporation involved in the marketing of logs (Sissoo) collected from the government forests. TCN and DFPSC are harvesting mostly the dead, dying, diseased and fallen trees from state forests because there is a moratorium on the harvest of green trees except for national and pilot projects. DDC employs contractors to collect drift timber and fuel wood outside the boundaries of state forests and sell it through competitive bidding.

#### Auction by DDC

Drift timber and fuel wood outside National forest are collected by DDC through contractors and these products are sold through an open auction.

#### Auction by DFO

There is a provision to auction timber and fuel wood by the DFO. The DFO has to obtain approval from the DoF or the MoFSC depending on the auction value of the wood sold in the competitive market.

### *B. Some examples of timber-based selected medium enterprises in Nepal*

#### **Sawmill:**

It is estimated that 86 percent of all timber consumption takes place outside industrial units, i.e. rural consumption (FAO, 2003). Industrial sawmilling is done by private sawmills. All sawmills are technically similar, consisting of a horizontal band saw with a very simple carriage and a vertical band saw for re-sawing. Power is supplied by electricity or a diesel engine. Private sawmills are licensed without giving timber quotes and are dependent on

parastatals for their log supply. Sawmilling industries supply the town with sawn wood, where it is used for furniture, joinery, building and construction.

Based on the growth of urban population and assuming a constant per capita consumption and 10 percent demand by development projects, the demand for the industries sawn wood is shown in the table N. 20.

**Table 20. Demand for industrial sawn wood until 2010**

Particulars	1985	1990	1995	2000	2005	2010
Urban population, million	1.194	1.549	1.971	2.466	3.030	3.654
Consumption 000 m <sup>3</sup> per capita	0.059	0.059	0.059	0.059	0.059	0.059
Subtotal 000 m <sup>3</sup> /yr	71	91	116	145	179	216
Development projects (10% above)	7	9	12	15	18	22
Total demand 000 m <sup>3</sup> /yr	78	100	128	160	197	233
Corresponding log requirement, 000 m <sup>3</sup> /yr	166	213	272	340	419	506

Source: MPFS, 1988

The current capacity of the sawmilling industry is more than sufficient to meet sawn wood requirements until 2010. However, most of the mills will have to be renovated before that date. Some have to be relocated to have better access to raw materials. Nowadays several CFUGs have been running community-based wood depots and sawmills successfully as a promising enterprise in the mid-hills and the Terai region of Nepal.

#### **Furniture industry:**

Nepal's furniture industry includes modern factories, hundreds of small workshops and thousands of individual carpenters. To meet future demand, there is room for additional modern factories, but these will have to secure raw materials from the parastatals. Existing factories already enable to operate at full capacity because of the lack of raw materials. While furniture has export potential, since its value added nature could overcome the high transport cost, there are problems to be solved in the supply of raw materials, product quality, suitable designs, and knowledge of export markets.

In rural and remote areas of Nepal some community forests have initiated community furniture enterprises with the support of NGOs. These enterprises have fulfilled the local demands of furniture and agricultural tools. Due to the infant stages there is need of excessive support in further research and capacity building in sustainable production, management and marketing. Millions of agriculture equipments and construction materials like doors or windows are produced by this community based rural enterprises and individual carpenters annually.

#### **Wooden handicraft:**

Wooden handicrafts are produced all over the country at cottage industry level. There are no estimates of the volume or value of craft production for the country as a whole. However, for the Kathmandu valley 4 300 m<sup>3</sup> of sawn wood is utilized by the handicraft industries and the value of the production is estimated at US\$1 million (MPFS, 1988).

Although the required volume is not large, producers are not obtaining good quality wood on a regular basis. This problem is hampering the export possibilities of the industry.

**Table 21. List of timber and fuel wood enterprises and their sales in 2006 (Dolakha & Bajhang)**

SN	Enterprise Name	District	Enterprise Type	Products	Economic Participants			Total Sales (NR)
					HH	Male	Female	
1	Community timber depot, Bhitripakha CFUG	Dolakha	CFUG	Timber	237	656	642	381 856
2	Community fuel wood and timber depot, Suspa CFUG	Dolakha	CFUG	Fuel wood, Timber	303	769	833	213 693
3	Community timber depot, Dhandesingdevi CFUG	Dolakha	CFUG	Timber	311	633	655	310 875
4	Community timber depot, boldesetidevi CFUG	Dolakha	CFUG	Timber	225	570	585	152 400
5	Community fuel wood depot, Jiri	Dolakha	CFUG	Fuel wood	472	1170	1203	137 080
6	Kailash timber and fuel wood depot	Bajhang	CFUG	Timber	240	767	787	15 000
7	Ranada timber depot	Bajhang	CFUG	Timber	214	638	632	37 500
8	Pariban timber depot	Bajhang	CFUG	Timber	155	471	398	0
9	Tagunna timber depot	Bajhang	CFUG	Timber	81	270	262	0

Cottage and small industries are established to reduce poverty through employment generation. Loans are being provided under the intensive banking program. Loans totalling NR 212.4 million were provided to 828 industries in five development regions in the fiscal year 2003/04. In the first six months of fiscal the year 2004/05, 649 industries altogether received a total of NR 180.1 million in loans (Source: Economic Survey, GoN 2004/05).

### C. Government royalty

According to Forest Regulation 1995, relating to Rules 9, 10, 18, 25, 46, 48 and 53 the government royalty for Sissoo is NR 150 per cubic foot.

## Socio-economic and Policy Issues

### A. Socio-economic factors

*Dalbergia sissoo* is one of the most potential valuable species for afforestation and a good source of cash income for poor and medium farmers in Terai that can alleviate poverty among rural people. It is a useful multipurpose tree, producing fuel wood, timber and



fodder, and it is the most widely used fodder species in Terai. Over 90 percent of the seedlings taken from community forestry nurseries in Terai for planting by farmers are Sissoo. The success rate in planting by farmers has ranged from 59 to 65 percent. At the Forest User Groups level there are many very small enterprises running from by tradition to fulfil the local demand regularly. These enterprises do not count as local enterprises and are not documented by the government or other the NGO sector development agencies. For example millions of agricultural tools, wooden plough, carts and other agricultural equipments have been produced by local artisans by utilizing Sissoo wood and traditional skills. It is very important to meet the market demand and the economic scale of production. Such forest-based small and medium forest enterprises are generating valuable employment and earning revenue.

**B. Government Policy on sale and distribution of timber (Sissoo) and fire wood**

(I) Provisions relating to sale and distribution of timber and fire wood in government managed forests:

1. Nepal's government, by publishing a notification in the Nepalese gazette, may constitute District Forest Product Supply Committees comprising the following chairperson and members in the district specified in the same notification in order to sell and distribute Forest Products pursuant to sub-rule(2) keeping in mind the convenience for the general public:
 

a) Chief District Officer	Chairperson
b) One district level representative each of all political Parties recognized at the national level	Member
c) Funds and Accounts Controller	Member
d) District Forest Officer	Member Secretary
  
2. The committee constituted in the district pursuant to sub-rule (1) shall obtain a license from the authorized officer pursuant to Rule 8 (Any person, District Forest Product Supply Committee or Agency desirous of obtaining forest products shall submit an application to the authorized officer) & make arrangements for the sale and distribution of timber and firewood for the following purposes:
  - a) for domestic use by rural people;
  - b) for low cost development and construction works to be undertaken through public participation;
  - c) for relief from natural calamities and for agricultural tools.
  
3. In the case of districts where timber and fire wood are not available according to the work plan, Nepal's government may make an arrangement for their sale and distribution by bringing them from another district where they can be obtained.

4. Timber and fire wood sold and distributed for the purpose mentioned in sub-rule (2) may not be used for any other purpose or transported outside of the district concerned.
5. The authorized officer may sell and distribute by auction all such timber as the one sold and distributed but not taken away within the time limit or the one left in stock after sale or distribution on the basis of the current market price and at rate not lower than the rate prescribed in Annex 2 (Forest Regulation, 1995).
6. The quantities and procedures of timber and fire wood to be sold and distributed shall be as specified in the work plan.
7. The authorized officer shall sell and distribute timber and fire wood only after collecting royalties as prescribed in Annex 2 of Forest Regulation 1995. For example, the government royalty for the sale of *Dalbergia sissoo* is NR 150 per cubic foot.

**(II) Provision relating to the sale and distribution of forest products in community forests:**

1. The Forest Users Group (FUG) shall collect, sell and distribute only those forest products which are available pursuant to the work plan.
2. After collecting timber, fire wood and other forest products pursuant to sub-rule (1), the CFUG shall make arrangements for the reforestation or rehabilitation of the relevant forest area as soon as possible.
3. The CFUG shall inform the concerned district forest office about the sale rate of forest products.
4. In case the CFUG is capable of running an industry based on forest products according to the work plan, it may run such industry outside the area of the community forest after obtaining the approval of the relevant agency upon recommendation of the district forest officer.

**(III) Provisions relating to transportation of timber in private forests:**

1. Any person or institution desirous of having a registration of private forest shall submit an application in the format prescribed in Annex 24 of Forest Regulation 1995 to the concerned district forest office along with evidence to prove the ownership on the land.
2. In case the owner of a private forest wants to use the forest products of the private forest for his/her own purpose at the place where they are located, he/she may do so after notifying the District Forest Office (DFO) in writing either directly or through the relevant Area Forest Office (AFO) at least twenty four hours before such use, along with

the recommendation of a member of the concerned Village Development Committee (VDC) or Municipality explicitly mentioning the categories and quantities of such forest products.

3. The owner of a private forest may transport the forest products of the private forest by providing a written notice to the concerned DFO at least twenty four hours in advance along with the recommendation of a member of the concerned VDC or Municipality, explicitly mentioning the category and quantity of forest products and have the matter endorsed by the forest check posts located en route.
4. The owner of a private forest which is not registered shall submit an application to the DFO either directly or through the AFO to cut trees on his/her private forest. The DFO may conduct the necessary enquiries into the application and grant permission to cut trees.
5. Timber from a private forest mentioned in sub-rule (3) may be transported only after obtaining a release order from the concerned DFO and shall have the matter endorsed by the check posts located en route.
6. For the purpose of transportation the timber collected from the trees cut in a private forest before the commencement of this regulation, an application shall be submitted to the officer or committee specified by the government by publishing a notification in the Nepalese gazette. The timber shall be transported according to the decision taken by the officer or committee, specified after conducting the necessary enquires into such application.

### **C. Enterprise links and associations**

The Ministry of Forests and Soil Conservation (MFSC) and the four departments under it are the major government forestry institutions. MFSC is responsible for policy formulation in the forestry sector. It does that in close collaboration with the National Planning Commission for plans and programmes and the Ministry of Finance for the budget. It is also responsible for drafting forest legislation in close rapport with the Ministry of Law and Justice. The four departments under the MFSC are:

- Department of Forests
- Department of Soil Conservation
- Department of National Parks and Wildlife Conservation
- Department of Plant Resources

The ministry is also responsible for supervising the operations of the following parastatals and development boards:

- Nepal Rosin and Turpentine Industry
- Herb Production and Processing Company
- Forest Products Development Board
- Forest Research and Survey Centre Development Board

The Timber Corporation of Nepal (TCN) under the Ministry of Supplies is involved in the marketing of logs collected from the government forests. Forest User Groups (FUGs) also comprise a prominent institution in the use and management of the forest resource. A large number of NGOs, both national and international, are active in Nepal. Because of the extensive destruction and degradation of the forest resource in the country with an adverse impact on the supply of forest goods and services, many of them have incorporated tree planting and forest conservation in their agenda.

Likewise, a large number of bilateral and multilateral donors are providing technical and financial support to Nepal. The more important bilateral donors are: USAID, ODA, AusAid, DANIDA, FINNIDA, GTZ, SDC, JICA and SNV. The multilateral donor agencies are: World Bank, FAO, EU, IFAD, ADB and UNDP. Agencies like CARE and UMN are also involved in Nepal's forestry sector. Many other institutions are also closely associated with the forestry sector in Nepal. These include: Institute of Forestry, Tribhuvan University, professional societies such as Nepal Foresters Association, Association of Forest-based Industrialists, Ministry of Population and Environment and many environmental fora.

### **Key Opportunities and Threats**

It is a good source of income for poor and medium farmers that can support poverty alleviation among rural people. It is a useful multipurpose tree, producing fuel wood, timber and fodder, and it is the most widely used fodder species in Terai. Due to earlier, hazardous harvesting, lack of conservation and cultivation practices, Sissoo is declining in the natural habitat. For sustainable supply of Sissoo the wild source may not be sufficient. In order to make the supply sustainable, Sissoo should be cultivated in mass scale.

The price of goods in the Indian market nearby to Nepal's border makes goods in and out of Nepal increase their price either way. This is the case applied to forest productions, when the market price for Sissoo logs is higher in India than in the Terai, wood is often smuggled into India instead of banning the export of unfinished products.

Sissoo is one of the most potentially valuable species for income generation at lower altitudes, in the Terai, Bhabar and Duns. In large scale plantations it is out yielded by *Eucalypts* (though its lower volume yield is to some extent offset by the higher density and better quality of its wood), but for communal plantations it has the advantage of being easier to propagate. It is a useful multipurpose tree, producing fuel wood, timber and fodder.

It is a good source of cash income for the poor and medium farmers of Terai. Enterprises operate at the local level to meet the requirement of local people. The poor quality of the products reduces the ability to compete in the market. Very few have succeeded to extend their market to the district, at national and sometimes international level. A large number of such enterprises are neither recognized nor recorded, so they are not linked to proper a marketing chain/system and /or opportunities. They do not have logistics, technology or input supply.

## Comparison of six species/products

Here we compare the six species/products covered in the diagnostic study. The table below outlines the major strengths and weaknesses associated with them.

**Table 22. Comparison of the six species: strengths and weaknesses**

Species/product	Strengths/advantages	Weaknesses/disadvantages
Kurilo	<ul style="list-style-type: none"> <li>• Cultivation technology readily available</li> <li>• Commercial cultivation in place</li> <li>• Cultivation can be extended to a wider geographical area</li> <li>• Increasing demand in domestic and international market (e.g., listed as one of the top 30 most demanded NTFPs in India)</li> <li>• Price increasing</li> <li>• No ban or restrictions on collection, trade and export</li> <li>• Easy regeneration</li> <li>• Seedlings/saplings locally available on a commercial scale</li> <li>• Used in multiple Ayurvedic preparations/medicines, tonic and food supplement</li> </ul>	<ul style="list-style-type: none"> <li>• Confusion on varieties of <i>Asparagus</i></li> <li>• Cumbersome post-harvesting handling, e.g., roots have to be boiled, dried and cleaned</li> <li>• Limited use as raw materials within the country, i.e., export-dependent</li> <li>• Problem of distinguishing collections sourced from private versus national forests</li> </ul>
Jatamansi	<ul style="list-style-type: none"> <li>• High demand in both domestic and international market</li> <li>• Endemic to Nepal-limited competition in the market</li> <li>• Market price of essential oil is increasing</li> <li>• Local value addition as essential oil: distillation is simple</li> <li>• Multiple uses- in Ayurvedic formulations and aromatherapy</li> </ul>	<ul style="list-style-type: none"> <li>• Ban on export in crude form</li> <li>• Cultivation technology not available (and not practised)</li> <li>• Found in remote, mountain locations</li> <li>• Limited information on availability of the resource</li> <li>• Limited use as raw materials within the country, i.e., export-dependent</li> <li>• Collection is destructive; sustainable harvesting technique not developed</li> </ul>
Wintergreen	<ul style="list-style-type: none"> <li>• High demand in both domestic and international market</li> <li>• No ban or restrictions on collection, trade and export</li> <li>• Well-established international market for wintergreen oil</li> <li>• Local value addition as essential oil: distillation is simple</li> <li>• Multiple uses - in Ayurvedic formulations and aromatherapy</li> <li>• Collection is not destructive</li> <li>• Raw material easily available; good natural regeneration (no need for plantation)</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• High competition in the market</li> <li>• Limited use as raw materials within the country, i.e., export-dependent</li> </ul>

Species/product	Strengths/advantages	Weaknesses/disadvantages
Lokta	<ul style="list-style-type: none"> <li>• FSC certified products available</li> <li>• High international demand</li> <li>• Indigenous technique of papermaking available</li> <li>• Finished products are developed locally</li> <li>• Domestic demand for paper is high, used in legal documents</li> </ul>	<ul style="list-style-type: none"> <li>• Artificial regeneration confined to experimental level only</li> <li>• Consumes large quantity of fuel wood during papermaking</li> <li>• Quality papermaking requires highly-skilled labour work</li> <li>• Very high competition within country, product differentiation is lacking</li> </ul>
Chiraito	<ul style="list-style-type: none"> <li>• Whole plant is used in trade</li> <li>• Easy post-harvest handling- as whole plant is dried and sold</li> <li>• Nepali Chiraito from Eastern Nepal is valued as the best in the world</li> <li>• Cultivation technology readily available</li> <li>• Commercial cultivation in place- especially in Eastern Nepal</li> <li>• Increasing demand in domestic and international markets</li> <li>• No ban or restrictions on collection, trade and export</li> <li>• Relatively easy regeneration</li> <li>• Seedlings/saplings locally available on a commercial scale</li> </ul>	<ul style="list-style-type: none"> <li>• Adulteration of other varieties of Chiraito</li> <li>• Export-dependent</li> <li>• Problem of distinguishing collections sourced from private versus national forests</li> <li>• Limited local processing- i.e., sold in raw form</li> <li>• High-volume product: difficult for handling and high transport cost</li> </ul>
Sissoo	<ul style="list-style-type: none"> <li>• Fast growing timber</li> <li>• Fairly good quality but inexpensive timber</li> <li>• Great demand in furniture and sawmills industry</li> <li>• Can be grown in marginal, fallow lands</li> <li>• Seedlings/saplings easily available</li> <li>• Cultivation widely practised in private and community lands</li> </ul>	<ul style="list-style-type: none"> <li>• Susceptible to disease: high chance of crop failure</li> <li>• Texture of the wood from planted trees is considered inferior than wild</li> <li>• No export recorded- limited to domestic market</li> </ul>

## KEY OPPORTUNITIES AND CHALLENGES FOR SMFES

In this section we briefly survey the key opportunities and challenges for Nepal's small and medium forest enterprises (SMFES).

### OPPORTUNITIES

The following are some of the key opportunities that SMFES can take advantage of.

**Growing international and domestic market demand.** In recent years, there has been a trend according to which developing countries are the major producers and exporters of raw or semi-processed products and developed, industrialized countries are the major importers. Global markets for Nepal's NTFPs are large and the demand for these products is increasing as more and more people from developed countries are attracted to natural products. While timber products are used exclusively within the domestic market in Nepal, Nepal's NTFPs are exported to a large extent. Within Nepal also, mainly urban people are increasingly attracted to natural products, such as herbal tea, Ayurvedic medicines, and herbal body care products. Nepal's SMFES will need to capture these new market trends.

**Income and employment opportunities.** SMFES are generating valuable employment and earning revenues from crude, semi-processed, and finished products. These enterprises operate at the local level to meet the requirements of local people. Community based SMFES are providing a very important opportunity for rural economy in the hills of Nepal. For instance, most rural people depend on NTFPs and on the collection and selling of medicinal plants for cash income and livelihood generation.

**Availability of external support.** Nepal's Government bodies and several NGOs and projects provide technical and to some extent start-up capital funds to establish SMFES. Loans are being provided in order to establish SMFES under the banking programme, as Nepal Rashtra Bank (Central Bank) has issued directives to commercial (and development) banks to invest a certain portion of loans in the rural and underserved areas/sectors. Nepal's Tenth Five-Year Plan (2002–2007) also recognizes the potential for sustainable use of forest resources for poverty alleviation through the promotion of forest-based micro and small enterprises.

**Conducive forestry policies.** There is an equal opportunity for the private sector to take full advantage of the current policy provisions of leasehold, private forestry and community forest to invest in the area of SMFES and the establishment of better planting materials of NTFPs. These forestry programmes provide rights to local people over the forest resources. Wood-based enterprises like furniture, wood depots, agricultural tools manufacturing are also increasing in rural areas and local market centres in Nepal. Now there is an opportunity to materialize SMFES as a promising sector after the successes of community forestry and community-based natural resource management.

The small and medium forest enterprises (SMFEs) sector is the one with the highest potential for fast growing industrial sectors in Nepal. In least-developed countries like Nepal, SMFEs are one of the more viable opportunities to create employment and consequently to reduce poverty. Moreover, since Nepalese society is characterized by social exclusion, unequal development of such enterprises can address different social realities of women and men across varied classes, castes, ethnic and age groups, as well as locations.

## **CHALLENGES**

There are a number of challenges that SMFEs in Nepal have to face:

**Assuring product quality.** Nepal's SMFEs and forest product entrepreneurs in general have failed to ensure consistency as regards product quality and to supply a predictable and sufficient quantity to cover orders from foreign companies. The poor quality of the products reduces the ability to compete in the market. Very few have succeeded to extend their market to the district or to the national and sometimes international level.

**Market information.** There is a very limited flow of accurate information on the market of forest products: demand, supply, quality and quantity required by domestic and international markets. SMFEs possess inadequate knowledge of products and markets, causing lack of access to favourable markets and prices.

**Brand recognition.** There is very limited recognition of the brand by international market organizations as regards SMFEs in Nepal.

**Government policy and legislation.** The CFUG operational plans lack provisions of NTFP management and commercial harvesting of timber. Similarly there is stringent demand for environment-related compliances for SMFEs to start and operate. There are several other policy and regulatory challenges, which are already discussed in this report.

**Inadequate national priority.** Despite the policy rhetoric of poverty reduction and support to forest-based enterprises, SMFEs have not received an appropriate level of government support and encouragement. Forestry officials tend to discourage trade of forest products within the community as well as private forestry even when the existing legal framework allows it.



## CONCLUSION AND RECOMMENDATIONS

This report is an outcome of an agreement between the FAO and ANSAB that focused on small and medium forest enterprises (SMFEs) and their potential to contribute to poverty reduction and sustainability. This report in particular focused on outlining the SMFEs in Nepal and to present the current status of SMFEs in various aspects, including a discussion on the ownership and management structure of the SMFEs, raw materials sources, overall employment situation in Nepal, seasonality of the operations of the enterprises, use of technology and the market situation of forest products. The key challenges for forest-based enterprises were identified, and aspects of access to finance, labour issues, and broader governance issues were outlined. Six enterprises were identified: sawmilling, furniture industry, plywood, wooden handicraft, paper mills and non-timber forest products. An overall status of these enterprise types was also presented.

We also carried out a diagnostic study of six major non-timber and timber products from Nepal. In this report we identified five major NTFPs that are most commonly traded and cultivated: Kurilo, Chiraito, Jatamansi, Wintergreen and Lokta. Only one timber species, viz sissoo, was included in this report. For each species, we have included a fairly detailed account of biology, management issues, indigenous and commercial uses, socio-economic and policy issues and have also identified the linked opportunities and challenges. While a more comprehensive report could have been developed, our presentation has been economical due to lack of time and resources and lack of availability of data. This report is prepared mainly from ANSAB's previous works, field visits, meetings/workshops and drawing from secondary sources. The objective of this study was to gather background information, present key issues and identify research priorities. The report points to several aspects, especially pertaining to the establishment, operation and sustainability of forest-based enterprises, that would deserve further action in terms of research and development support.

### CONCLUSION

SMFEs in Nepal have the potential to create economic opportunities- income and employment- at local and national level. SMFEs contribute not only to the economy, but also strengthen the conservation of natural resources and biodiversity. SMFEs can be triggered by facilitating service delivery in some crucial aspects such as marketing, resource management, technology development and conducive policies. Local groups or individuals have the capacity to learn how to manage the various dimensions of enterprise activities. Several modality options allow for emergence in different contexts and for different goals to be focused.

Ownership structures and the nature of the linkages to natural resources are the two principle dimensions of SMFEs modalities in Nepal. We identified seven ownership types that include individual/family enterprises, CBO enterprises, CFUG network, CFUG/individual networks, network of individuals, government parastatals, and private

limited companies involving promoters and public shareholders. These enterprises have specific strengths and weaknesses in generating profits, benefiting the poor, and conserving natural resources. While companies and sole enterprises are efficient in creating profits, CFUGs and their consortium and co-operatives have scope for creating more favourable equity impacts. All have contributed to the conservation of natural resources though in varying degrees. All these issues, therefore, have to be assessed as part of the analysis for a SMFE. The enterprise modality, which is chosen, can respond very well to these kinds of issues but it needs to be selected judiciously. There is no blueprint for designing enterprises. They must be organized in such a way that the entrepreneurs can equally participate and respond to market forces and at the same time have ensured access and control over raw material supply.

There are certain factors that facilitate or hinder the operation and growth of enterprises. These include external inputs, marketing outlets, community characteristics, natural resource base, technology, and policy factors. External inputs in terms of awareness raising, technical assistance in resource management and enterprise development and operation, and finally support have determined the fate of enterprises. Market demand, marketing information, channels and marketing infrastructure together constitute marketing outlets that determine the successful operation of SMFEs. Community characteristics that influence the operation and growth of a SMFE include leadership, local institutions, entrepreneurship culture, economic objectives of the entrepreneurs, and others. Policy factors have crucial effects on SMFEs success. Implementation, distortion and rapid change in the policy environment has created added risks to enterprises, and in many cases severely impacted on the managerial, financial, economic, and ecological aspects of the enterprise operation.

SMFEs have several positive impacts on the local economy, social equity and natural resource base. We found an increase in income for entrepreneurs, not only as individual income but also in the form of savings in community funds of CFUGs. Men and women in the community have obtained employment opportunities as part-time or full-time jobs in enterprise management, raw material collection, processing and marketing. Creation of such opportunities at the local level has indicated a potential to reduce poverty. Similarly, SMFEs have benefited collectors and CFUG members, including the poor, the disadvantaged and women. Depending on the institutional context that the enterprise is bestowed with, the poor and women have been involved and have benefited from the enterprise significantly. Emergence and growth of SMFEs sometimes bypass local traders who may be affected adversely, but they still have an opportunity to be part of the enterprise itself. SMFEs can also contribute to natural resource conservation in a number of ways. As entrepreneurs became aware of the value of natural resources in their livelihoods and developed a sense of ownership, they have improved resource management plans, institutionalized sustainable harvesting practices and paid for the resource conservation activities.

## **RECOMMENDATIONS**

SMFEs have the potential for local economic development, ensuring social equity, and conserving natural resources. But this involves tremendous active efforts on the part of government, supporting agencies, and entrepreneur communities. This will actually

determine the establishment of the SMFEs and the impact they have. The following are the key recommendations that emerged from this study:

1. **Provide services in resource management, marketing, financing and technological development.** External inputs in institutional, technical, financial and marketing services have been the crucial factors for the success of SMFEs. An integrated delivery of such services through suitable service providers is recommended. While at the beginning such services may be subsidized, gradually these services should be delivered through private or NGO sectors on a cost recovery basis.
2. **Use market-driven strategies.** Market driven strategies should be adopted in the process of SMFEs development, from selecting products to designing enterprise modalities and activities. The important factors for such strategies include efficiency, product quality, production volume, promotional measures, and economies of scale.
3. **Provide forward linkages.** It is important to provide support to SMFEs for forward linkages with buyers, especially supporting communication, building up mutual confidence and, when necessary, facilitate buyer-seller agreements/contracts. It is necessary to create and facilitate the development of national level marketing enterprises to provide fair and equitable forward links to community-based enterprises.
4. **Ensure the sustainability of the resource base.** It is important not just to ensure a consistent supply of raw materials to SMFEs, but also wider conservation values, such as ecosystem services. SMFEs need to have mechanisms to check over-harvesting or improper harvesting and executable plans for countermeasures against habitat loss.
5. **Build up service provider capacity.** The type and extent of services required by SMFEs are many. Services are critical in areas such as providing market information, access to technology and financial support, quality control. Timber-based products with existing markets require relatively simple technology but a lot of management capacity building and advocacy support. Intermediaries that may include I/NGOs and the private sector should be encouraged to provide such services to SMFEs.
6. **Link with fair trade business.** Natural products and organically certified products are often tied to the international fair trading system. The ultimate buyers of most of the forest products are mainly outside the country. Understanding the preferences of foreign buyers and designing products to cater to their needs is not possible with the capacity of most SMFEs. Therefore a national programme needs to be in place that connects SMFEs to fair trade companies abroad.
7. **Provide incentives for SMFEs.** It is important on the part of the government to recognize SMFEs as a priority sector in investment and provide export concessions and tax rebates, so that they can compete fairly with bigger companies.
8. **Improve policy and regulatory environment.** The emergence and growth of SMFEs are constrained by lack of a conducive policy and a regulatory framework. They need to be revised to facilitate the delivery of the services required and remove unnecessary controls in collection, trade, and export.

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## **Forest Connect**

### **Reducing poverty by linking small and medium forest enterprises with national forest programmes, markets and service providers**

Forest Connect is an international alliance dedicated to tackling the isolation of small forest enterprises. Established in late 2007, its aims are to avoid deforestation and reduce poverty by better linking sustainable small forest enterprises to each other, to markets, to service providers and to policy processes such as National Forest Programmes (nfps).

It currently involves partner institutions in 12 countries: Burkina Faso, China, Ethiopia, Ghana, Guatemala, Guyana, Laos, Malawi, Mali, Mozambique, Nepal and recently also the Democratic Republic of Congo plus a broader network of supporters in > 60 countries linked by an international social networking site.

The Forest Connect alliance is co-managed by the Natural Resources Group within the International Institute for Environment and Development (IIED) and the Community-Based Forest Enterprise Development programme (CBED) of the Food and Agriculture Organization of the United Nations (FAO).

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Webpage small-scale forest based enterprises:

<http://www.fao.org/forestry/site/25491/en>

Forest Connect: <http://www.fao.org/forestry/site/42297/en>

International social networking site: <http://forestconnect.ning.com>

