

# Chapter 11

## Commercialisation of Natural Resources for Sustainable Livelihoods: the Case of Forest Products

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### 11.1 Introduction

Mountain communities in South Asia, especially those who live in the Hindu Kush-Himalayan region, are characterised as marginalised communities in terms of their access to capital, technology, and decision-making authority; fragile in terms of the health of the ecosystems they live in; and vulnerable in terms of their overwhelming dependence on natural resources. The region is facing greater and more difficult challenges than ever before in achieving balanced economic growth, alleviating poverty, and sustainably managing their renewable natural resources. People's dependence on forest and related natural resources is historic, cultural, and inevitable as other viable alternatives for earning a living have been few and far between. As the economies of the predominantly mountainous countries in the region are gradually liberalised and a wave of consumerism is setting in, the income needs of the people have been steadily growing. The consequence of this trend has been the commercialisation of forest products, mainly non-timber forest products (NTFPs). Among the NTFPs, the preference for a particular commodity is generally guided by the prevailing market forces, and these are of both a traditional and economic nature.

Medicinal and aromatic plants, rattan, wildlife products, and different types of food supplements dominate the list, as they are relatively high-value and low-volume commodities. The timber trade, which used to be strong in some areas during the early fifties and sixties, has been rapidly losing ground, and almost all the South Asian countries are now net importers of timber and timber products.

### **Value of forest resources**

The Hindu Kush-Himalayan (HKH) region is rich in natural resources such as forests, rangeland, rugged but awe-inspiring snow-clad mountains, and marginal lands. It is estimated that only around 20% of the total landscape of the region is forested. However, the remaining 55% of wild lands are classified as shrub lands and rangelands, most with more than 30% slopes, and these are also rich in related natural resources (Myint 1998). Together these lands are home to more than 140 million people and a large number of domesticated and wild animals (ICIMOD 1998).

The role of forest resources in meeting increasing human needs and the deteriorating plight of mountain forests during the past four decades have caused intense national and international debates and raised concerns in the Himalayan region. However, attention and interventions have so far focused mainly on resource degradation, loss of biodiversity, and the effects of loss of forest cover on the regional and global climates. Inadequate attention has been paid locally, nationally, and internationally to the serious implications of diminishing forest resources for local people who depend on forests for their livelihoods.

Despite the number of bilateral and multilateral programmes and projects designed and implemented during the last three decades in most of the countries of the HKH region, the forest-dependent communities remain among the poorest. In recent years, the community and participatory forestry programmes being implemented under various names in most of the countries in the HKH region have somewhat enhanced the access to forest resources by local communities as well as raising greater awareness regarding their rights over and responsibilities towards the protection and management of the forests. Yet, as the forest areas are not uniformly distributed across the population regions and the quality thereof is not similar, there remains a built-in inequity in access to and benefit from the forest resources. Most of the public forest lands in the HKH region are located in remote areas where transportation facilities are either non-existent or difficult, markets are distant, and public services such as schools, health care, telephone, and extension services are limited. Employment opportunities are severely limited as the mainstay of the economy is agriculture, and this in itself is subsistence oriented, the main reason being the unsuitability of predominantly sloping lands for intensive agriculture. These conditions severely limit villagers' livelihood opportunities. To make the situation worse for local communities, because of their ethnic, geographic, and economic marginality, they also have become marginalised politically, lacking a forceful voice and proper representation in the seats of power. In such a situation,

local communities have developed their security strategies based on forest resources, and especially on non-timber forest resources.

### **Recent initiatives**

In recent years, as part of a move to empower the local communities, a number of political, legislative, and development initiatives has been launched for the benefit of the local communities of the HKH countries. The 73<sup>rd</sup> and 74<sup>th</sup> amendments to the Constitution of India, establishment of an autonomous Chittagong Hill Tract Autonomous Council in Bangladesh, implementation of a Decentralisation Act in Nepal, and ongoing moves to form district-level governments in Pakistan are some of the examples of serious efforts to delegate resource management authority to local self-government. These efforts auger well for the sustainable management of forest resources, as among the best incentives for better management of open access resources are assignation of legal and administrative ownership to the actual stakeholders and exclusion of free riders. However, assigning the management authority for and usufruct rights over the forests to local communities, which in most cases lack financial resources, technical know-how, managerial expertise, and information infrastructure, is fraught with danger. Communities with a shorter planning horizon and a propensity to develop cash-oriented management systems may end up in a trap of unsustainable commercialisation of their forest resources , as witnessed in the case of some FUG-managed forests in Nepal.

As mentioned above, the main purpose of this paper is to highlight the importance of commercialisation of forest products to the peoples of South Asia, especially NTFPs; the increasing risks and danger of unmanaged commercialisation in the HKH region; the diversity of cases prevalent in the region; lessons learned for the countries of South Asia; and possible follow-up activities that can arise from these experiences.

The paper argues that devolution of forest management authority to local communities in the HKH region , on the one hand, does provide a good opportunity to improve the living standards of the poor; however, on the other hand, it may lead to an increase in exploitation of resources in order to raise the incomes of local people. In addition, to create sustainable means of earning a living, the commercialisation process has to be well planned, designed, and monitored. Above all, the people at the collection and production levels need to understand and participate in the process in order to reap an equitable benefit from it. It is also argued that commercialisation of forest products is inevitable in the HKH region, which is not only known to be one of the 12 biodiversity 'hot-spots' in the world but is also an area beset with extreme poverty and deprivation. Governments, NGOs, and the private sector need to plan the commercialisation process to meet basic human needs, achieve high literacy rates, improve access to education and health care facilities, improve the quality of life, and provide a clean and safe environment. Before discussing the strategies, the role of the forest in supporting livelihoods is discussed.

## **11.2 The Forest and Sustainable Livelihoods**

### **Sustainable livelihoods**

Livelihood implies capabilities, assets (resources, infrastructure, claims, and access), and activities required to earn a living. A sustainable livelihood is one that can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide opportunities for future generations (Chambers and Conway 1992, cited by IFAD 1999). Forest and allied resources in the HKH region are highly suited to secure the livelihoods of local people, and this is due to reasons that will be discussed later in the paper.

### **Forest dependent livelihoods**

Mountain people earn their living from the forests in many ways: 1) earning cash income; 2) satisfying their needs for fuel, medicine, shelter, and supplementary food; 3) using traditional agricultural inputs such as leaf litter, fodder, small tools, and water; and 4) cultivating land inside the forest boundaries as forest encroachers. Because of the physical remoteness, the linkage between the local community and forestry is traditional, and they are economically and ecologically inseparable from each other. Dependency on forest resources is both historic and cultural — so much so that it is an integral component of the forest ecosystem of the region. The forest and many tribal groups in the northeastern Himalayas are inseparable and, therefore, very rightly, they consider the forest as their nourishing mother. Some of the distinct items on which the communities in the HKH region are dependent on forests for their livelihoods are described in the following passages.

### **Sources of food**

Forests and trees contribute to household food security and family nutrition through a variety of mechanisms. Hill and mountain communities, especially those in remote areas, are found to use forest products in a significant proportion of their regular diet. In predominantly subsistence economies in South Asia, many forest and tree foods make important contributions to household nutrition. Tree foods are comprised mainly of fruit and seeds, nectars and saps, stems and tubers, and leaves, twigs, and mushrooms. In Yunnan Province in China, the middle hills of Nepal, and the northeastern region of India, bamboo shoots are commonly used as fresh or preserved vegetables. Producers in China, Northeast India, and Nepal export these to domestic and international markets.

### **Sources of fuelwood**

Fuelwood from the forests forms a critical component of the food security of the people, since, without fuelwood, food consumption or meal frequency may decrease, and this contravenes the cultural practice of mountain communities. In mid-hill regions of the Himalayas, fuelwood has become scarce and, as a result, women spend more time collecting it, leaving less time for food production, food preparation, income generation, child care, and personal rest. Lack of fuelwood in sufficient

quantity and quality is also having a serious impact on the quality of nutrient intakes by mountain people.

### **Sources of medicine**

Wild or domesticated plants constitute the main medicinal sources in most mountain societies in the HKH region. Mountain communities use them to treat most common ailments and correct micro-nutrient deficiency. Many animal diseases are also treated with herbal medicines. By preventing and treating diseases, medicinal herbs not only improve the effective biological use of food but also improve the nutritional status of the family. A large number of mountain communities also collect and sell medicinal plants in their raw form, including through barter trade. This trade is mostly trans-border and is based on traditional trade channels and networks that, in this age of information technology, work against their interests and the outside traders mostly exploit them.

### **Sources of employment**

Forests provide one of the good avenues for employment in the HKH region. Collection and sale of medicinal plants and other NTFPs alone are considered to be one of the biggest sources of seasonal employment (three to four months a year) for the mountain communities of the HKH region. Bamboo and rattan are another group of NTFPs providing large-scale employment to the artisans and village craftsmen. In order to ensure year-round employment and a better income for the collectors, integration of other development activities with NTFP conservation and use is necessary.

### **Sources of cash income**

Although, large amounts of NTFPs are collected by the mountain communities in the HKH area, no comprehensive study on the amount collected, number of people (especially women) engaged in collection and trading, and the marketing chain involved has been carried out to date. However, several case studies (Edwards 1993; Bajaj 1996; Karki et al. 1997; and Karki and Karki 1997) have been carried out to highlight the importance of NTFPs in sustaining the local economy and supporting livelihoods.

According to Bajaj (1996), collectors in Jan and Bahraini villages of Kullu district in Himachal Pradesh (HP), India, earned an average annual income of INR 6,000 and 18,250 per annum respectively. Karki and Karki (1997) estimated a monthly family income of INR 4,960 from making bamboo furniture in a study conducted in eastern Nepal. In North Cachar district of Assam, India, the contribution of NTFPs to the annual household income of the family is 25-30% (Myrbo et al. 1995). Thus, the commercialisation of forest products in South Asia has already started, especially in forest rich areas like the mountains. There is, however, a wide variation in the nature, process, and impact of commercialisation in the region.

### 11.3 Forces of Commercialisation

#### Dwindling importance of timber products

Until some years ago, forests were known to be a source of timber and other 'minor forest products' (MFPs). The actual and potential roles of the multiple products and environmental services offered by forests were virtually ignored (Ruiz and Byron 1998). Since the early eighties, MFPs have been given greater recognition both in name and content and are known as non-timber or non-wood forest products (NTFPs or NWFPs). Today, forest products invariably refer to NTFPs, especially in relatively inaccessible and mountainous regions such as the HKH. In the HKH region, although subsistence and economic values of both timber and NTFPs can be substantial and, by managing a judicious mix of both, it may be possible to ensure a continuous flow of diverse products and income to local community members, it can be safely argued still that, in the context of mountain economies, NTFPs have greater potential to contribute to achieving sustainable livelihoods (FAO 1996). NTFPs play a vital economic role for at least 25% (or around 30 million) of the people living in and around forests and rangelands in the HKH region who still depend for food, medicine, and shelter on these products. Table 11.1 below indicates the dependency of typical hill communities on NTFPs for their livelihoods and Annex A, Table 11.1 gives the contribution of NTFPs to the rural economy in north-eastern India.

Table 11.1: Extent of household dependency on NTFPs in the HKH Region

Country/Region	% of HHs Engaged in Collection	Av. Income by % of HHs	Remarks
Humla, Nepal <sup>1</sup>	52.5%	< Rs. 2000-06-21 (18.6%) > Rs. 2000 (53.6%)	Between 1990 and 1998 the % of HHs collection of NTFPs rose from 2 to 72%
H.P. India <sup>2</sup>	100%	Rs. 5125 (100%)	Data based on a total of 359 HHs in Kullu dist.
Assam and Meghalaya India <sup>3</sup>	5-100%	Rs. 1500-3000	

Sources: SEEP/ANSAB 1999  
Bajaj 1996  
Myrboh et al. 1995  
North East Council (See Annex A Table 1)

#### Growing potential of NTFPs

NTFPs have a number of advantages for people in the mountain region: the products are small in volume and production is often household based; they often involve a diversity of products; they are generally seasonal in nature providing food and supplementary income often during periods of food shortage (Campbell et al. 1996). As well, they are labour intensive, use simple technologies, provide direct benefits to the local people, and, most importantly, they are accessible to low income and

socially disadvantaged groups; and to women especially. In the hills and mountains where, in general, poverty is rampant and inequity pervasive, NTFP-based forest management is likely to distribute benefits more equitably within communities and families targeting women and landless people.

There is also an ecological reason for the increase in promoting commercialisation of NTFPs. In contrast to ‘timber-only’ harvesting regimes, many NTFP-based activities involve the harvesting of annually renewable plant parts and products. If the extraction rate is at par with annual growth, harvesting forests for NTFPs could be an ecologically benign and economically sustainable activity.

In the context of commercialisation of forest products, NTFPs have been, therefore, selected for discussion in this paper. It is argued that NTFPs play a vital economic role for the people living in the remotest areas of the HKH, not to mention the vast majority of the population who still depend, to some extent, on forest-based traditional medicinal products such as the Ayurvedic, Unani, Tibetan, and folk medicine systems.

Small-scale, forest-based enterprises, many of them based on NTFPs, especially bamboo and rattan, provide significant employment and income sources for poor people in the region. In Bangladesh, about 0.3 million in the hills are employed as part-time labourers harvesting, processing, and transporting bamboo from the forests (Banik 1997). In Nepal, bamboo and rattan provide employment to an estimated 0.1 million people (Karki and Karki 1997) and in India the figure is 40 million days of employment in the medicinal plants’ sub-sector only (GOI 2000). However, in the mountain regions of South Asia, medicinal and aromatic plants play by far the most important role in providing a secure living, especially for food and medicinal products and cash for emergencies.

### **Medicinal plants as keystone products**

Of all the NTFPs, medicinal plants are the most significant products from the point of view of their potential for economic development and creation of sustainable livelihoods. Medicinal plants provide the bulk of the raw materials for preparation of formulae used in traditional systems of medicine such as the Ayurvedic, Tibetan, Unani, and folk systems of health care that are extensive throughout the HKH region. The growing popularity of natural product-based medicines both nationally and internationally, has increased commercial demand for plant materials, putting additional pressure on limited resources<sup>1</sup>. Large volumes of medicinal and aromatic plants (MAPs) are collected and traded through legal and illegal channels. India is at the centre of the HKH region’s export trade in MAPs. Taking advantage of its size, well-developed trading networks, and relaxed border controls with Nepal, Bhutan, and Myanmar, Indian traders are able to obtain raw materials easily and regularly.

<sup>1</sup> In India, the Ayurvedic drug market alone is worth over IRs. 25 billion, while the export earnings in 1998/99 were estimated to be around IRs. 4.463 billion (GOI 2000; CHEMEXCIL 1999).

As the conservation status of several medicinal plant species continues to worsen, the Indian government has put an export ban on 54 medicinal plant species (Appendix B, Table 11.1) and is proposing to include several native medicinal plant species in the appendices of the Convention on International Trade in Endangered Species (CITES). Nepal has also banned 10 species (Appendix B, Table 11.2) - eight for export in raw form and two for collection, use, sale, transport, and export (Kanel 1999). However, policy mechanisms that aim to control harvesting and trade of threatened species are often ineffective because of the weak and faulty enforcement measures adopted by regulating agencies, and collection and trade of these species continues illegally. Indeed, the traders often prefer banned species as the economic margins are greater than those for species that are not banned due to the increased difficulty of obtaining and transporting these species. The experience of NTFP trade between India and Nepal can help to improve understanding of the issues of cross-border trade between other countries in the HKH region.

### **Unsustainable exploitation of wild resources**

Although both wild populations and cultivated crops provide the raw materials needed for commercial production of medicinal plant products, the supplies from wild sources are preferred because of their perceived high potency and low prices. Economically poor and landless collectors rely on the cheap, readily available, wild populations, often engaging in unsustainable harvesting practices in order to meet their daily needs and, in part, unaware of the potential negative consequences of their practices. It is estimated that more than 90% of the raw materials used for commercial purposes originate in the wild, and this has caused growing environmental concern, especially about the rapid erosion of genetic resources.

## **11.4 Risks and Dangers of Commercialisation**

### **Pitfalls and dangers**

Commercialisation of NTFPs poses a number of pitfalls and dangers. As most of the NTFPs are common property (open access) goods, they have the potential for exploitation as public goods. Thus, unregulated commercialisation can wipe out valuable biodiversity resources completely within a short period of time, for example, *Taxus baccata* in Himachal Pradesh and *Swertia chiraita* in the Eastern Himalayas have been harvested unsustainably due to their high market demand. As a result, the latter is no longer found in India and is imported from Nepal. Rattan in Nepal is another example of a product that has been subjected to unsustainable commercialisation, and this has led to its near extinction from natural habitats.

An unplanned, poorly implemented, and unmonitored commercialisation process can be damaging to the environment as well as to the communities involved, as it may lead to mining of forest land for raw materials and its use as a sink for waste and pollution. It may also degrade and erode hilly slopes by over-harvesting and unsustainably consuming the forest products. Many multinational companies,

especially those involved in the pharmaceutical and timber trade, have been accused of operating in developing countries, often using unscrupulous means of extracting natural resources in the most unsustainable ways. The commercialisation of forest products is certainly a controversial and sensitive issue in the HKH region, although it is increasingly becoming an economic necessity for both the countries and the people, especially those living in marginalised areas.

### **Resource depletion through unsustainable use**

The increasing use of medicinal plants for health care can help conserve the environment, fostering a consciousness of the value of biodiversity, but their increased demand can also destroy local ecosystems and push threatened plants to the brink of extinction. The traditional uses of medicinal plants may also decline as a result of increasing commercialisation of the medicinal plant sector and diversion of raw materials for sale on the market. Indigenous communities in northeast India had traditionally used *Mishmi Tita* or *Coptis teeta*, a bitter root, for treating various ailments. With practically all the supplies being exported today, it has been replaced by a poor substitute, i.e., opium, the use of which has greatly increased among local communities endangering their health and welfare (Aryal 1993). Secondly, the gatherers and local traders are themselves put at risk because of the unsustainable extraction practices which is fuelled by their desire to earn more cash in a short period of time. This tendency arises if the local community does own the resources. Therefore, the second danger of commercialisation of forest products is its potential to destroy the natural resource base permanently and leave the poor people worse off than ever before, unless, of course, it is strategically planned, carefully regulated, and pragmatically supported.

The lack of resources has also led to rampant adulteration, of both raw materials and formulas. Popular name brand traditional drugs such as ‘Chavanprasha’ are generally believed to lack the full complement of ingredients or to have one or more major ingredients missing or replaced by substitutes (Narayan 1998). Plant parts, such as stems, roots, and leaves, that resemble genuine medicinal plants are sold and used widely to prepare spurious formulations (CSE 1997). This has raised serious health concerns because of the poor and unknown safety and efficacy parameters of these formulas and highlights the need to address issues of standardisation and quality control in the commercialisation of plant-based drugs. Legislative and regulatory mechanisms must be developed to ensure that herbal products are safe and efficacious for the consumers, most of whom are unaware of the minimum quality and efficacy parameters.

### **Threat to traditional knowledge systems**

Many rural and tribal women and men have specific knowledge and skills about the use and management of medicinal plants that pharmaceutical companies and other industries rely on for the development of new pharmaceutical products and treatments. Some 30% of pharmaceutical drugs have been developed through examination of

the use of these plants in traditional medicine (Tempesta and King 1994). It is claimed that, by referring to indigenous knowledge and consulting indigenous peoples, the success rate from bio-prospecting can be increased from approximately one in 10,000 to one in four (Holley and Cherla 1998), although this figure can be disputed given the very wide range.

However, local people generally receive little or no compensation for their indigenous knowledge in the current process of commercialisation. A comprehensive understanding of the application of intellectual property rights' regimes and establishment of alternative mechanisms are needed to ensure a more equitable system of recognising the value of local and indigenous knowledge. Similarly, there is a clear need to develop working mechanisms to create frameworks for sustainable partnership between industry and rural communities to enhance both the sustainable uses of medicinal plants as well as the economic development of rural communities. According to several studies (Olsen Smith 1997; CECI 1999; ANSAB 1999), although the main participants in the trading activities of NTFPs are the collectors, presently the bulk of the market return from NTFPs is earned by private traders who practice non-transparent systems of trading and exploit local collectors, often paying them less than the equivalent of the normal wage for their labour. In some states of India, NTFPs have been nationalised, ostensibly to increase the benefits to collectors. However, this has merely shifted the exploitative roles from traders to the government and quasi-government agencies. In the hills of the Western Himalayas, the government of Uttar Pradesh has established district cooperatives to promote sustainable harvesting of medicinal plants and to provide market guarantees for produce collected. However, the district-level Medicinal Plants' Committee, which issues licenses and area permits for collection and trading, controls the process by distributing the permits evenly between two government-run cooperatives, viz., Bheshaj Sangh in Kumaon and Garhwal Vikas Mandal Nigam in Garhwal. The poor gatherers still work as labourers, although at supposedly fair wage rates provided by these cooperatives. Marginalised communities, in general, lack information regarding the official procedures and are therefore often prevented from receiving the benefits due from the entire NTFP collection and trade.

## **11.5 Status of Commercialisation of NTFPs in the Region**

### **Multiplicity of stakeholders**

Commercialisation of NTFPs has been receiving fervent attention in recent years from both government and private sectors alike, because of the increasing demand for natural products, especially products related to food and health, in the national and international markets. As there is a growing demand for phyto-medicines and dietary supplements in the western market and traders from the HKH region have a comparative advantage in terms of cost and resource endowment, they might be able to dominate the market in countries such as the USA and Germany for certain products such as *Taxus baccata*. Other reasons for such high stakes being attached to the

commercialisation of NTFPs arise from their habitats being in the biodiversity hot spots of the world: rainforests in the tropics, cold deserts in the Himalayas, and dry deciduous forests in the hilly regions. Various international covenants, such as the Convention on Biological Diversity (CBD), Trade Related Intellectual Property Rights (TRIPS), and World Trade Organisation (WTO), have also highlighted a close linkage between commercialisation of NTFPs and misuse of indigenous knowledge, thereby making a close link between protection of Intellectual Property Rights (IPR) and unregulated commercialisation of NTFPs. Several studies have been carried out, therefore, on commercialisation of NTFPs (Karki and Holley 1998; Subedi and Bhattarai 1999; and Vedanand 1998) highlighting the need for a more comprehensive and pragmatic approach.

Studies have shown that, despite the overall economic importance of NTFPs, the proportion of the final sale price that small-scale collectors, producers, or processors are able to get is only a fraction of the actual price paid by the consumers (Boaz 1999). Although the incomes from NTFP activities are competitive with other income-generating activities in the HKH region, the share of the collectors from total gain in commercialisation is only a fraction of the actual return. The main reason for the exploitative nature of the trade is the lack of information on market prices for collectors and the oligopolistic or monopsonic nature of buying strategies practised by the wholesalers. For example, in the Gorkha district of Nepal, the margin earned by the collector is 46.6%, by the road-head trader 12.3%, and by the wholesaler 41.1%, and this appears to be unfair to both the road-head trader and the collector (Olsen Smith 1997). In Himachal Pradesh (HP), the difference between the final prices and village prices was found to be between 1.2 and 3.5 times (Bajaj 1997). Collection of NTFPs in many countries of the HKH region is not an illegal activity in itself. However, trade in a number of medicinal and aromatic plants is regulated by the government by imposing complete or partial bans on their sale, processing, and trading outside the local area. Unscrupulous traders take advantage of these ineffective regulations to exploit the collectors and local traders (See Tables 11.2 and 11.3 under case study No. 1 on pages 280-281).

### **Common problems in commercialisation**

Common problems facing commercialisation include difficulties in gathering NTFPs from the wild in adequate quantity and quality, domestication of endangered species to augment supplies, lack of skills for primary processing and marketing at the local level, and need for various product transformations beyond the original forms and constituents at the end-use level. Some of the specific issues common in the HKH region are as follow.

- Lack of basic infrastructure in the hilly and mountainous areas making access to market difficult and costly
- Low and erratic volume of raw materials supplied due to seasonal production
- Poor or variable quality of products

- Poor reliability and continuity in maintaining supplies due to lack of professionalism and business ethics
- Lack of an organised information system to benefit collectors and the producers
- Poor handling and storage facilities at the collectors' end
- Limited knowledge of products among consumers and products not meeting consumers' tastes, preferences, and values
- Archaic rules and regulations causing innumerable legal and administrative hindrances to the free movement of tradeable goods
- Lack of government support for credit facilities, godowns, and minimum price support

## **11.6 Lessons Learned and Future Directions**

### **Micro impact of globalisation**

In an increasingly interdependent world, commercialisation of goods and services is one of the most important factors determining a region's or a country's prospects for development. With continued decline in foreign aid to poor countries and of central budgets to poorer regions within a country during the past few years, trade and enterprise activities based on local resources are becoming increasingly important sources of livelihood. Neo-liberal economic theory states that trade allows for economic growth by creating new market opportunities, the generation of wealth, and increase in efficiency by maximising output for a given input of resources (Brack 1995; Cho 1995). However, in the context of a developing region such as the HKH, how the commercialisation of forest products can address the basic livelihood issues by creating new economic opportunities is a topic that needs redefining and redesigning in terms of development models with the aim of creating sustainable livelihoods.

### **Growing roles of civil society and the private sector**

In the HKH region, because of the combined forces of democratisation and liberalisation, governments are shifting environmental monitoring action and management to civil society groups and CBOs. Also, because of the decrease in government funding of public goods, CBOs, NGOs, and the private sector are taking on more and more responsibility for forest protection and management. Given these and a number of other factors, the role of the state in regulating commercialisation is becoming less important or is in the process of redefinition. The vacuum is increasingly being filled by CBOs, NGOs, and INGOs that play the role of facilitators, honest brokers, and monitors of the commercialisation process to ensure equity, fairness, and simple business ethics.

### **Move towards sustainable forest management**

In order to successfully embrace the trend of decentralised management of forest resources, it is imperative that both local governments and commercial companies

understand the magnitude of the resource crisis and the need to develop partnerships integrating socioeconomic and environmental criteria at both the policy and operational levels. They will also need to devise and implement a regime of sustainable management criteria and indicators to extract the raw materials sustainably. For example, international consumers are influenced increasingly by green labels such as 'fair trade', 'organic products', and 'sustainably managed' on the consumer products in making decisions related to consumption of one product over another. This trend will hopefully lead to a process that can be called 'sustainable commercialisation', which, incidentally, may be easier to establish in poorly developed areas of the HKH that is believed to have greater biodiversity enriched with rare medicinal plants, diverse foods, and other valuable flora and fauna than found in industrialised regions, as there is less infrastructure to transform and less resistance to changing the status quo.

### **Conservation and livelihood-oriented commercialisation**

Working towards sustainable commercialisation will require integration of trading practices with biodiversity conservation activities. The key question is how to operationalise the all-encompassing concepts of community-based conservation and livelihood security together. While there may be political pressure and a local constituency to promote domestic markets and subsistence use, in the increasingly globalised markets commercialisation cannot be sustainable without ensuring national, regional, and global connectivity and networking. This is more so with respect to products that thrive in niche markets and/or for which there is a poor or no domestic market. A case in point is the marketing of raw medicinal plant materials from western Nepal (see later as a case study). However, reaching the export markets will require development of standards; good collection, processing, and manufacturing practices; and labelling and packaging compatible with national and international standards.

### **Social responsibility of industry**

Trade and industry concerns especially multinational companies (MNCs) that can and will play a central role in developing sustainable policies and guidelines for promoting commercialisation strategies for NTFPs. Their widespread market linkages, global networking, and expanding economic power and influence are certainly unquestionable. It is logical that government organisations, civil society groups, and community-based organisations work in partnership with them to ensure that the commercialisation of NTFPs can also help promote sustainable livelihoods for poor communities. Although making the MNCs work as an equal partner in social cum business development is a challenging task, there is a need to determine the most appropriate mechanisms/structures to bring them into the picture to reconcile conservation of NTFPs and development of sustainable production and consumption systems - the twin pillar of sustainable livelihood systems in natural resource dependent societies.

### **11.7 Prerequisites for Sustainable Commercialisation**

Campbell (1996) listed a number of criteria on which to base analysis of products for commercialisation in the South Asian context. These are given below.

- Adequate availability of raw material (NTFP) in terms of quantity, quality, and regularity of supply
- Level of market demand, market accessibility, and scope for market promotion: international, regional, national, and local
- Possibility of augmenting raw material supplies through domestication and cultivation
- Access to processing technology, availability of skilled labour, infrastructure, and capital
- Potential for decentralised production and thereby downstreaming benefits to the local people
- Economic viability of raw material collection, downstreamed processing, and marketing
- Availability of a reliable market offering a buyback guarantee to collectors
- Availability of support services, e.g., credit, extension, and market information

#### **Need for an integrated approach**

In order to achieve sustainable livelihoods in the HKH region through commercialisation of forest products, support to integration of locally-based trade and commercial activities in NTFPs with national, regional, and global trade and a commercial network is essential. Local-level commercial ventures will remain marginalised and vulnerable unless they operate beyond niche markets and participate in the broad-based production to consumption chain with a regional and global span. The communities and trading partners need facilitation in developing partnerships with commercial agencies, but the partnership should be based on the philosophy of business responsibility towards the environment and local community (Karki and Holley 1998). Creation of small and medium enterprises based on NTFPs might be one of the strategies that can improve a secure means of livelihood. Finding an appropriate type, size, and scale of small and micro-enterprises (SMEs) should be guided by the economic feasibility and amount of resources available. There is, however, debate concerning the determination of an appropriate type and scale of enterprise in inaccessible areas such as in the higher areas of the HKH region. Experience to date indicates that small enterprises based on primary processing of NTFPs may be an appropriate choice. However, some of the experiments carried out by research and development agencies (ANSAB 1999) indicate that guarantee of readily available buyers, if not an outright buyback guarantee in the initial phase, is necessary to stabilise the enterprise. The enterprises have to be community-based, i.e., participation by a large number of stakeholders in designing, managing, and operating the venture is a prerequisite. This will be possible if the commercialisation

process is built on the concept of a production-to-consumption system , giving it a holistic approach to commercialisation.

### **Production-to-consumption and marketing (PCM) approach**

The HKH region is characterised by problems of inaccessibility, marginality, fragility, and seasonality; and in such a case, linking collectors and producers to end users is indeed a challenge and only a holistic approach can meet this challenge. The PCM approach helps us gain a more comprehensive understanding of the factors, players, and processes that link production to consumption and marketing networks. This process is holistic, as it has a built-in mechanism for making the system dynamic in linking the producers to consumers through a mutually dependent and beneficial mechanism.

Given the vast list of forest products, the different channels or routes of product transformation and movement within a particular PCM chain can be many. Some of the possible strategies for working towards sustainable and equitable commercialisation of NTFPs are as follow (Courville 1997).

1. Multinational best practices that incorporate social and environmental considerations such as sustainable harvesting and ethical business practices on the part of trading partners
2. Alternative trade linkages that rely on eco-labelling such as ‘fair trade’ and ‘sustainable management’ and ‘organic’ certification that links good practices to markets
3. A ‘social contract’ concept developing business and community relationships that mandate minimum environmental and performance criteria for both parties
4. Benchmark approach - in this approach, conventional public companies or private companies can be decided as benchmark standards to be achieved by others

### **11.8 Case Studies**

Two case studies are being presented to describe the scope and potential benefits of applying the production-to-consumption and marketing chain approach (PCMCA) to the commercialisation of NTFPs in the HKH region

#### **Case No. 1: Commercialisation of MAPs from Karnali Zone, Nepal (CECI 1999)**

Approximately 2,000 tonnes of medicinal and aromatic plants valued at about USD two million are harvested from the Karnali Zone of Nepal annually. Among the products marketed, ‘jatamansi’ (spikenard) or *Nardostychnus jatamansi* is the most important in terms of both volume and value (CECI 1999). Almost 95% of the trade is channelled through India. It should be remembered that this species is banned for export in raw form from Nepal, although export of its derivatives are banned from India.

Trade in NTFPs is the most important source of cash income in the Karnali Zone. The harvesting and collection are very difficult and arduous tasks and are undertaken only by the poorest, illiterate people. These people also belong to the lowest castes on the Hindu hierarchy which makes them vulnerable to rampant exploitation by commission agents. Medicinal plants have a small local market as well, as most communities depend on traditional medicine based on these plants. However, only local healers can prepare and use these herbs to provide health care.

### **Trade patterns**

Appendix C, Table 11.1 presents a trade channel in medicinal plants involving five species: (*Picrorhiza kurroa*), Atis (*Delphinium himalayans*), Padamchal (*Rheum australe*), Bhutkesh (*Selinium tenuifolium*), and Kaladana (*Eulophia spp*). The village traders, who are mainly from Jumla but also from Kalikot, Mugu, and Dolpa districts, collect the products and sell to the airport traders in Jumla. Airport traders arrange the necessary permits, tax clearance certificates, and the cargo planes and ship the materials by plane to Nepalganj. These traders usually have some prior price information and fixed buyers before shipping the consignments. Nepalganj traders in turn negotiate with traders in Lucknow and Delhi in India to pay the export duties at the border and transport the products to a predetermined destination. Indian traders (known as Pansari) then bulk the materials in to a mixture and sell them to Ayurvedic drug manufacturing companies such as Dabur, Vaidyanath, Himalaya, and Zandu in India. The drug manufacturing companies produce the drugs based on the traditional formulas or on their own pharmacological innovations and sell the drugs to retailers. Many of the drugs do come back to Nepal for local consumption. The tables below indicate the profit margin for different traders in the case of Kutki (*Picrorhiza scrophulariflora*) and Jatamansi roots (*Nardostachys jatamansi*).

From the above tables, it is clear that in the case of legally permitted products such as *Kutki* roots (Table 11.2), village traders and airport traders make the most profit (19% and 43% respectively). However, in the case of banned products such as *Jatamansi* roots (Table 11.3), Nepalganj traders make the most profit. The traders

**Table 11.2: Profit margin for Kutki roots from Karnali Zone, Nepal**

Participants	Buying Price, NRs/kg	Royalty NRs/kg	Product & Market Cost NRs/kg	Selling Price, NRs/kg	Margin NRs/kg	Margin %	Profit to Sale Ratio %
Collectors	n/a	n/a	45	55	10	11	18
Village Traders	55	n/a	3	75	17	19	23
Airport Traders	75	10	27	150	38	43	25
Nepalganj Traders	150	n/a	10	170	10	12	6
Indian Traders	170	n/a	10	193	13	15	7
Total	--	--	98	--	88	100	--

Source: CECI 1999

Table 11.3: Profit margin for Jatamansi roots from Karnali Zone, Nepal

Participants	Buying Price, NRs/kg	Royalty NRs/kg	Product & Market Cost NRs/kg	Selling Price, NRs/kg	Margin NRs/kg	Margin %	Profit to Sale Ratio%
Collectors	n/a	n/a	34	40	6	7	15
Village Traders	40	n/a	3	45	2	3	4
Airport Traders	45	15	27	105	18	22	17
Nepalganj Traders	105	n/a	25	172	42	52	24
Indian Traders	172	n/a	10	195	13	16	7
Total	--	--	99	--	81	100	--

Source: CECI 1999

also practise an oligopolistic strategy by forcing the airport traders to negotiate the price on their terms. Since these traders are also knowledgeable about the forward linkages, i.e., markets in India through their network of family members and business connections, it is very difficult for small traders, such as airport traders, to enter this illegal business (CECI 1999).

### ***Critical findings***

CECI (1999) in its analysis concludes that for products for which export is legal, the trade risks are less and the trade is therefore less controlled by Nepalganj traders with more benefit flowing to local traders than is the case for illegal products. The poor collectors seem to receive somewhat better returns than in illegal trading. The researchers also indicate a recent trend of increased competition between local traders and airport traders due to the presence of local processors. Perhaps the increased profit margin enjoyed by the Nepalganj traders is due to the paucity of competition. Recommendations for improvement in the medicinal plant sub-sector are given in the following section.

- i) Increase the bargaining power and marketing capacity of local users by organising them into collectors' or traders' associations in order to increase market efficiency.
- ii) Limit risks by providing them with working capital and storage facilities at both Jumla airport and in Nepalganj. This will increase their bargaining power with wholesalers, decrease risks of deterioration in stock, and prevent distress selling.
- iii) Increase competition in Nepalganj and other towns in the Terai by making appropriate legal changes, and these should include a review of the ban on species and making the trade more transparent.
- iv) Explore the possibilities of increasing technical efficiency by establishing primary processing units in socioeconomically and environmentally feasible locations.

## **Case No. 2: China Bamboo Sector - A Case Study of an Intensive Production to Consumption System in Anji County, China (based on Maogong et al. 1996, cited by Belcher 1998)**

### ***Commercialisation process***

Bamboo is one of the most important forest resources in China. There is a long history of bamboo plantation in the country, especially in the mountain regions and on degraded lands. Beginning in the 1980s, a series of economic policy reforms led to a great increase in bamboo-based industries triggering unprecedented activities related to trade and commerce. The case study looked at a thriving bamboo sector in Anji county of Zhejiang Province in China. With only 0.054 ha of per capita arable land, agriculture is of a subsistence nature. Rural people have a high dependence on forest products which are dominated by bamboo, occupying 30% of the forest area and accounting for 51% of the total production. Bamboo culm production reached 30,000 tonnes in 1995, along with 3,200 tonnes of bamboo shoots and 6-8,000 tonnes of bamboo by-products. Bamboo industry outputs contribute 50-80% of the total industrial production of the townships and earn 30% of the county's revenue.

The key market participants in the market trade are farmers, traders, product manufacturers, sub-contractors, domestic wholesalers, and foreign trade companies. The PCM system is very dynamic. Triggered by the incentive-oriented policy changes that lifted the land ceiling and production quotas in China, levels of production and productivity of culms, shoots, and by-products have increased rapidly over the past 15 years. Processing industries have expanded rapidly as a result of the infusion of cash and technology from expatriate Chinese families and the favourable market response from domestic and international markets.

### ***Critical findings***

The lessons learned from this case study are many. First of all, farmers were allowed to capture a 100% productivity increase above the land rent which was set low based on the historical trend. The result was startling, as bamboo production rose from 9.5 million culms in 1981 to 17.3 million in 1995. Secondly, an open market policy removed price and trade control and monopoly marketing. This led to a fundamental change in the market. In 1983, less than two million bamboo culms were traded privately; by 1994 the figure had risen to 16 million culms. In 1984, the policy was changed permitting private, collective, and joint investment in the bamboo sub-sector. In 1985, there were 154 bamboo-based enterprises, of which 43 were privately run. By 1995, there were 527, 61% of which were privately run, with 18 with joint venture companies. The joint ventures have been especially important in introducing new technologies and products. The collaboration between domestic and foreign companies was crucial for access to new technologies and capital in the trade.

The rapid expansion of the volume of production was matched by dramatic improvement in quality as well. Production shifted from agricultural tools aimed at low-end markets to consumer goods meant for a high-end export market. Products

such as mats, panel boards, floorboards, and good quality handicrafts now dominate the sector along with a range of processed bamboo shoot products. In 1994, export of bamboo products earned USD 117 million for the county. Since 1990, exports have grown by 320%. Among the problems faced by the sector is scarcity of raw materials, the prices for which have increased by more than 250% in real terms since 1980. Manufacturers, especially of bamboo shoots, run below capacity because of insufficient raw materials. Harvesting of bamboo has been regulated to promote sustainable management, and this has led to drastic fluctuations in the prices of raw materials. Institutional solutions are emerging, with factories buying in advance to guarantee raw material supplies and prices. Some factories have diversified and others have modified technologies, operating round-the-clock during bamboo shoot seasons and later using canned shoots for further processing.

## **11.9 Conclusion and Recommendations**

### **Policy and institutional frameworks**

The commercialisation of forest products, especially NTFPs, in the HKH region needs to be carried out using a holistic, pragmatic, and participatory approach. It is absolutely necessary that gatherers and producers are directly involved in the collection, production, primary processing, and trading of the NTFPs to strengthen the PCM chain. This will require an enlightened forest policy - a policy that is informed by the local collectors, community leaders, professionals, and civil society groups. An issue of equal importance is the need to change the mindset of all three key stakeholders: i) relevant government agencies; ii) local people who have the usufructs rights; and iii) commercial agencies involved in NTFP-based trade and industry. Governments need to be made aware of the amount of goods and services the rural people draw from the forests, as well as the real value of NTFP resources to their national economies. The people also need to realise that, like trees, NTFPs also need serious management inputs of both a technical and socioeconomic nature if instability in the supply and processing systems is to be avoided.

The goal of achieving sustainable livelihoods in the hills, valleys, and mountains of the HKH region will require changes at different levels. At the policy level, there is a need to understand the multifaceted nature of products that have the potential to trigger off rural development provided right incentives are provided to key players such as collectors and local traders. Imposing an outright ban on the collection and trading of endangered species is definitely not an answer to the problem of species' depletion. Giving forest stewardship to the community and making them aware of the value of the forest is a better policy. Value-added benefits should be given priority over increasing collection and harvesting rates for raw materials. Attention should be paid to improving quality, standardising harvesting practices, developing storage technologies, and improving marketing. Product diversification and upgrading technology should be regular features of small enterprises to ward off price fluctuations and change in consumer interest. The key point is that development of reliable and

equitable markets is the basic condition for investment in sustainable management systems for NTFPs.

### **Application of the PCM approach**

The PCM approach provides a framework within which many issues pertaining to commercialisation of forest products can be organised. It focuses on greater understanding of various marketing and processing options, with emphasis on the linkages between different transformation points and among firms at any particular transformation point. The PCM approach also introduces the dimension of product intensity to address the aspects of system dynamics. This is particularly important in forest product development, especially at the level of raw material production, because domestication and commercialisation have to be carried out by maintaining a number of conservation oriented trade-offs and compromises. The PCM approach considers the various participants in the system and their functions in three dimensional forms: vertical linkages, horizontal linkages, and product intensity (Belcher 1998). This is quite relevant to the process of NTFP commercialisation in the HKH region as currently there is an acute lack of backward and forward linkages in the production and trading practices.

### **Development and implementation of market information systems**

One of the main reasons for lack of commensurate local-level benefits from the ongoing commercial activities in the NTFP sub-sector in the HKH region is due to lack of information, especially market-related, for local collectors and traders. There is also lack of technical knowledge among the local people about the actual and potential uses of different NTFPs, their national and global markets, and processing technologies in the PCM chain. Knowledge and correct information illuminate every economic transaction, revealing preferences, giving clarity to exchanges, and informing markets. Lack of knowledge causes markets to collapse, or never to come into being. Loss of 'prior' knowledge, traditional knowledge in the case of medicinal plants, will also result in the loss of an age-old practice or an economic use in the furtherance of human welfare. A commercialisation process for NTFPs can also benefit from the new possibilities afforded by the ongoing revolution in information and communication technologies, provided the extension agencies, including the NGOs, facilitate the right kind of information flow and promote equitable dissemination among all the collectors and traders.

### **Key recommendations**

Recommendations for improving the sub-sector are as follow.

- i) Intensive management of NTFPs to increase production as currently only a fraction of forests are properly managed.
- ii) A shift to a household responsibility from a community responsibility system and introduction of family or individual leases to enterprising members of the community with a lease duration of at least 20 to 30 years.

- iii) Finding means to address the volatility of the raw material market; e.g., farmers should form marketing associations to build and retain bargaining and negotiating powers.
- iv) Government and NGOs should provide support to build marketing infrastructure such as godowns and transport networks in order to reduce the transport costs and distress selling.
- v) Private sector agencies in partnership with NGOs should support information networking, especially to disseminate market and price-related information to collectors and producers.
- vi) Manufacturing industries should diversify their products and markets to their optimum capacity.
- vii) Research should be promoted to increase NTFP productivity in both raw materials and key constituents; for example, in bamboo, both shoot and culm production should be increased so that a sustained yield can be maintained

To sum up, commercialisation of forest products, especially NTFPs, has great promise for promoting economic growth in the poverty-stricken areas of South Asia. However, the current process is highly inequitable and unsustainable. The forestry sector, especially the NTFP sub-sector, needs to be given the requisite recognition by governments and industry by formulating policy and institutional changes to decentralise production-related decisions, provide necessary incentives, and develop partnerships between industry and community groups such as Forest User Groups, Forest Protection Committees, and local government bodies. A holistic approach based on the production to consumption and marketing system (PCMS) is recommended as appropriate and should be applied by the relevant government and commercial agencies to lead the NTFP sub-sector towards sustained growth and development. Lessons learned from the case studies described on medicinal plants and bamboo have important lessons for future commercialisation plans and programmes in the HKH region. It can be safely argued that commercialisation, if managed properly, has the potential to increase income, enhance social equity, and strengthen the security of a large number of poor people in the HKH region.

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Table 11.1: Non-timber forest products in the rural households economy in the north-east region of India

Items	North Cachan Hills Assam	Karbianglong, Assam	West Khasi Hills Meghalaya	West Gano Hills, Meghalaya
<b>% of HHs Involved in Extraction</b>				
<i>Bamboo</i>				
- Subsistence Uses	50-60	45-50	100	100
- Commercial Uses	2-3	3-4	0.5	0.7
<i>Cane</i>				
- Subsistence Uses	10-12	12-15	-	-
- Commercial Uses	3-4	5-6	0.15	-
<i>Others</i>				
- Subsistence Uses	-	-	45	-
- Commercial Uses	-	-	0.3	1
<b>Quantity Used/Sold</b>				
<i>Bamboo</i>				
- Subsistence	0.25 t/yr	0.25 t/yr	0.45 t/yr	0.3 t/yr.
- Commercial	20-30 t/day	35-40 t/day	3-4 t/day	30-40 t/day
<i>Cane</i>				
- Subsistence	12-15 kg.	10-15 kg.	5-10 k/yr	-
- Commercial	120-150kg.	215 kg/yr.	225 kg/ear	-
<i>Others</i>				
- Subsistence			5 kg/yr	70-75 kg/yr
- Commercial				
<b>Contribution to HH Economy</b>				
- Bamboo	25-30 %	25-30%	15-20%	50-60%
- Cane	25-30%	30-35%	15-20%	-
- Others	10-15%	15-20%	55-70%	30-35%

Source: North-Eastern Hill University, Shillong

Key : HHs - Households

Table 11.2: List of plant species banned for export by the Government of India

(Vide Government of India, Ministry of Commerce; Public Notice No. 47 (PN)/92-97

New Delhi: Dated 30<sup>th</sup> March, 1994)

- |  |   |
|--|---|
| 1. <i>Acontinum</i> species                            | 29. <i>Ephedra</i> species                                  |
| 2. <i>Atropa</i> species                               | 30. <i>Gynocardia odorata</i> (Chaulmogri)                  |
| 3. <i>Aristolochia</i> species                         | 31. <i>Hydnocarpus</i> species                              |
| 4. <i>Angiopteris</i> species                          | 32. <i>Hyoscyamus niger</i> (Broseword)                     |
| 5. <i>Arunadinaria</i> Jaunasarensia                   | 33. <i>Strychnos potatorum</i> (Nirmali)                    |
| 6. <i>Balanophora</i> species                          | 34. <i>Swertia chirata</i> (Charayatah)                     |
| 7. <i>Colchicum luteum</i> (Hirantutya)                | 35. <i>Urginea</i> species                                  |
| 8. <i>Commiphora whightii</i>                          | 36. <i>Beddomes cycad</i> (Charayatah)                      |
| 9. <i>Coptis</i> species                               | 37. ( <i>Vanda Coerulea</i> ) Blue vanda                    |
| 10. <i>Drosera</i> species                             | 38. ( <i>Saussurea Lappa</i> ) Kuth                         |
| 11. <i>Gentiana kurroo</i> (Kuri, Kutki)               | 39. Ladies slipper orchid ( <i>Paphiopedilium species</i> ) |
| 12. <i>Gloriosa superba</i>                            | 40. Pitcher Plant ( <i>Nepenthes khasiana</i> )             |
| 13. <i>Gnetum</i> species                              | 41. Red Vanda ( <i>Renanthera imschootiana</i> )            |
| 14. <i>Iphignia indica</i>                             | 42. <i>Rauvolifa serpentina</i> (Sarpagandha)               |
| 15. <i>Meconopsis betonicifolia</i>                    | 43. <i>Ceropegia</i> species                                |
| 16. <i>Nardostachys species</i> (Jatamansi)            | 44. <i>Frerea indica</i> (Shindal Mankundi)                 |
| 17. <i>Osmunda</i> species                             | 45. <i>Araucarta araucana</i> (Monkey-puzzle tree)          |
| 18. <i>Rhododendron</i> species                        | 46. <i>Podophyllum hexandrum</i> (emodi Indian Podophyllum) |
| 19. <i>Physochliana praealta</i> (Bajarbang)           | 47. <i>Cactacea</i> species                                 |
| 20. <i>Praltia serpumilia</i>                          | 48. <i>Cyathea</i> species (Tree Ferns)                     |
| 21. <i>Rheum emodi</i> (Dolu)                          | 49. <i>Cycadacea</i> species (Cycads)                       |
| 22. <i>Berberis aristata</i> (Indian barberry; Rasvat) | 50. <i>Dioscoreae</i> species (Elephant's foot)             |
| 23. <i>Acorus</i> species                              | 51. <i>Euphorbia</i> species (Euphorbias)                   |
| 24. <i>Artemisia</i> species                           | 52. <i>Aloe</i> species (Aloes)                             |
| 25. <i>Coscinium fenestratum</i> (Calumba wood)        | 53. <i>Orchidaceae</i> species (Orchids)                    |
| 26. <i>Costus speciosas</i> (Keu, Kust)                | 54. <i>Pterocarpus santalinus</i> (Red sanders)             |
| 27. <i>Didymocarpus pedicellata</i>                    |   |
| 28. <i>Dolomiaea pedicellata</i>                       |   |

Table 11.3: List of notified medicinal plant species of Nepal

***Banned for Export in Raw Form***

*Nardostachys jatamansi* DC.

*Rauvolfia serpentina* (L.) Benth. Ex Kurtz

*Cinnmomum galucescens* DC.

*Valerina jatamansi* Jones,

*Abies spectabilis* (D. Don)

*Usnea barbata* Hoffm.

*Parmaia nepalensis* L.

*Taxus baccata* L. subsp. *wallichiana* (Zucc.)

***Banned for Collection, Use, Sale, Transport and Export***

*Dactylorhiza hatagirea* (D. Don) Soo

*Cordyseps sinensis* (Berc.) Sacc.

***CITES List*** (Appendix II)

*Picrorhiza scrophulariiflora* Pennell,

*Panax pseudo-ginseng* Wall.

*Dioscorea deltoidea* Wall. ex Griseb.,

*Podophyllum hexandrum* Royle

*Brachycorythis obcordata* (Lindl.) Summerh.

***Species in Red Data Sheets***

*Dendrobium longicornu* Lindl.

*Nardostachys grandiflora* DC.

*Aconitum ferox* Wall. Ex Seringe

*Picrorhiza scrophulariiflora* Pennell,

*Dioscorea deltoidea* Wall. ex Griseb

Table 11.4: Sub-sector channels-map of medicinal plant trading in western Nepal

Functions	Participants
Manufacturing/Retailing in India	Indian Retailers
Processing in India	Indian Processors
Wholesaling in India	Indian Traders
Trade in India	Nepalganj Traders
Storage	Nepalganj Traders
Trade to Nepalganj	Airport Traders
Certificates of Origin	Dept. of Plant Resources, KTM
Product Certification	Dept. of Plant Resources
Transport to Nepalganj	Airport Traders
Storage & Packaging	Airport Traders
Collection & Transport Permit	Dist. Forest Officer
Airport Trade (Buying)	Airport Traders
Local processing	Local processors
Village Trading	Village Traders
Cleaning & Drying	Collectors
Collection & harvesting	Collectors
Financing for collection	Traders (both Nepalganj & Airports)
Forest Management	Forest users group and district forest officer
Research	Govt. & NGOs

Source: CECI 1999