BioOne COMPLETE

A Typology of Economic Agents in the Himalayan Plant Trade

Authors: Olsen, Carsten Smith, and Bhattarai, Nirmal

Source: Mountain Research and Development, 25(1) : 37-43

Published By: International Mountain Society

URL: https://doi.org/10.1659/0276-4741(2005)025[0037:ATOEAI]2.0.CO;2

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

Downloaded From: https://bioone.org/journals/Mountain-Research-and-Development on 29 Mar 2024
Terms of Use: https://bioone.org/terms-of-use

Mountain Research and Development Vol 25 No 1 Feb 2005: 37–43

Carsten Smith Olsen and Nirmal Bhattarai

A Typology of Economic Agents in the Himalayan Plant Trade

Hundreds of plant species are harvested in the Himalaya and traded at local, regional, and international levels. Recent studies indicate that the annual trade in medicinal plants and related products from the Himalaya amounts to thousands of tons of roots, rhizomes, tubers, fruits, leaves, etc, with an annual value of millions of USD. It is difficult, however, to analyze and understand trade and markets on the basis of available studies, as these do not employ common terminology or methodology. The present paper aims to enhance understanding of the Himalayan plant trade by developing a typology of economic agents. The typology is based on fieldwork conducted in Nepal and India, including interviews with 639 harvesters, 149 traders and 143 wholesalers involved in trade with medicinal plants. These are the 3 main groups of economic agents distinguished. They are further divided into 6 sub-types and 13 specific types. Distinction among economic agents is made on the basis of key features. Basic data on agents are presented. The typology is developed to be applicable across the countries in the Himalayan range.

Keywords: *Medicinal plants; actors; marketing; market structure; terminology; Nepal; India.*

Peer-reviewed: *July 2004* ***Accepted:*** *September 2004*

Introduction

The volume of trade in plants across the Himalaya is enormous. Each year tens of thousands of tons composed of hundreds of species and products are traded (Murty 1993; Edwards 1996). A large part of this trade consists of medicinal and aromatic plants, encompassing those used medicinally in a narrow sense as well as those used for related and often overlapping purposes, such as food and cosmetics (Schippmann et al 2002). Recent studies have provided information on the medicinal plant trade from Pakistan to Bhutan and Arunachal Pradesh (eg Farooquee and Saxena 1996; Nawang 1996; Holley and Cherla 1998; Mulliken 2000; Olsen and Larsen 2003). Most of the trade is in raw materials, such as barks, leaves, tubers, roots, and fruits, though trade in semi-processed products, such as essential oils, also takes place.

The annual value of the trade runs to millions of USD. Products are gathered by rural harvesters in forests and from other types of vegetation in the mountains, and then traded along usually well-established marketing chains to the cities on the plains. The main market is India; wholesalers based there have suppliers throughout the sub-continent. They import products from all countries in the Himalayan range and distribute them to producers and retailers, mainly in India. A recent study found that more than 90% of traded medicinal plants harvested in Nepal go to India (Olsen in press). The trade has captured the interest of development institutions, both national and international, that see a potential for using medicinal plants to improve rural livelihoods while conserving biodiversity (eg Aumeeruddy-Thomas et al 2002; Subedi and Bhattarai 2002).

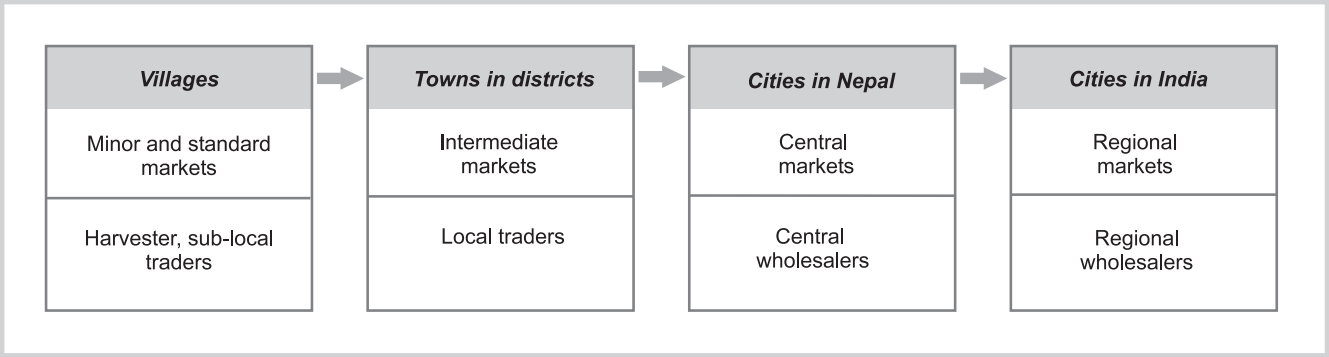
Available case studies do not employ common terms and concepts with which to distinguish between economic agents involved in the trade. For instance, use of unexplained vague terms such as “middlemen” or “intermediaries” is common. Thus it is difficult to make generalizations regarding economic agents, and consequently difficult to obtain an overview of the structure and function of markets for medicinal plants. To enable comparison between studies, it is necessary to develop a common terminology and methodology for trade studies. This article is concerned with the former, and aims to enhance understanding of the Himalayan plant trade by developing a typology of economic agents characterized by a set of key features. The typology has been developed on the basis of a nation-wide survey of medicinal plant trade originating in Nepal, and should be applicable to all countries in the Himalayan range. Data from this survey are used to present basic data on economic agents, such as annual income per harvester.

Methods and study area

Most studies of the plant trade in the Himalayas focus on medicinal plants; this trade was therefore chosen as the basis for developing the typology. Nepal was chosen as the case country, as this is where the majority of the studies have been undertaken. Although most studies are at the sub-district level, a few also investigate economic agents close to the end of the raw material marketing chain in India. The scope of the present work is limited to classifying and describing economic agents from the harvesting site to the main raw material wholesale markets; hence we are not concerned here with processors, retailers, and end users. The study is based on a review of literature and a nation-wide trade survey investigating the medicinal plant trade from Nepal to India and China (Tibet). Fieldwork was conducted from August 1998 to September 1999. The trade survey

Downloaded From: https://bioone.org/journals/Mountain-Research-and-Development on 29 Mar 2024
Terms of Use: https://bioone.org/terms-of-use

FIGURE 1 Simple generalized model of the flow of medicinal plants harvested in Nepal and exported to India: location, type of market, and dominant economic agents.



concentrated on a set of focal products and consisted of a district survey, a central wholesaler survey, and a regional wholesaler survey:

(i) *Focal products*. A set of 32 focal products was selected, based primarily on the work of Burbage (1981), Malla et al (1995), Edwards (1996), ANSAB (1997), Olsen and Helles (1997), and Olsen (1998). Criteria for selection were (a) the products must be traded along the same marketing chains, and (b) they must be important in terms of either value or volume at the development region level in Nepal.

(ii) *District survey*. Fifteen districts in Nepal were randomly selected for interviewing traders and harvesters. Criteria for selection were (a) 1 district in each of the 3 main physiographic zones in each of the 5 development regions; and (b) no 2 districts in the same physiographic region adjacent to each other. All traders purchasing medicinal plants and harvesters, met *en route*, were interviewed. In total, 149 traders (an average of 9.9 per district) in 28 districts, and 639 harvesters (an average of 42.6 per district) were interviewed.

(iii) *Central wholesaler survey*. A total of 90 central wholesalers who export products to India were interviewed in 24 districts in Nepal. This included all wholesalers in Nepal with exports to India in 1997–1998, the year of the case study.

(iv) *Regional wholesaler survey*. From these interviews, the 7 main cities in India importing medicinal plants from Nepal were identified: Delhi, Lucknow, Kanpur, Kannauj, Siliguri, Tanakpur, and Calcutta (Kolkata). These cities were visited, and 53 wholesalers importing medicinal plant products from Nepal were located and interviewed.

In all surveys, data were collected using standardized open-ended interviews. Data collection included questions on the profiles of economic agents at each node in the marketing chain (eg the age of central wholesalers).

A typology of economic agents

Literature review and fieldwork led to the identification of a generalized flow of medicinal plants, as well as identification of the dominant types of economic agents (Figure 1). The nomenclature for market types is according to Skinner (1964, 1965). In general, medicinal plants are gathered by rural harvesters in forests and from other types of vegetation. The harvested material is sold to local traders in the district of origin or surrounding districts; these traders are usually located beyond the road network in villages and smaller towns. Although there are thousands of these minor and standard markets in Nepal, there is usually only one or a few traders in each location. Thus markets are not the bustling, crowded marketplaces found elsewhere.

Trade usually takes place in private, as a negotiation between the trader and one or more harvesters (private treaty trading), most commonly at the trader's permanent location. The harvested material may also be sold to local traders based in district towns usually connected to the road network. There are hundreds of these intermediate markets in Nepal. Local traders in turn sell to central wholesalers based in the larger cities in the Nepalese Terai (and some middle hill cities, including Kathmandu), who then export to regional wholesalers in India. There is also small-scale trade with China (Tibet) in a few species. There are hundreds of thousands of harvesters, thousands of traders, and numerous wholesalers. Specific examples of the market chain structure can be found in Sharma (1995), Edwards (1996), Olsen and Helles (1997), and CECI (1999).

The general description of the medicinal plant marketing chain in Figure 1 identifies 3 economic agents: harvesters, traders, and wholesalers. Studies show that these are all involved in storage, processing, and transport to varying degrees (eg Edwards 1996; Olsen and Helles 1997). Each of the main groups is divided into 2 sub-types, for a total of 6 sub-types, which are again divided into a total of 13 specific types (Table 1). The table is used to develop nomenclature for the economic agents. Nomenclature is derived by reading from right

Downloaded From: https://bioone.org/journals/Mountain-Research-and-Development on 29 Mar 2024
Terms of Use: https://bioone.org/terms-of-use

to left, eg "generalist local trader." In some cases, the name of the type can be left out, eg "dedicated collector." An attempt has been made to develop terminology that is not specific to Nepal or India. Furthermore, each type, sub-type, and specific type in Table 1 is arranged according to increased capital intensity, eg domesticators require higher management input than collectors, and central wholesalers require more working capital than local traders. Types and sub-types are defined as follows:

Harvesters are people who gather medicinal plants for the purpose of selling to traders. Domesticators have integrated medicinal plants into agricultural land use patterns, eg through active cultivation in smallholder plantations or by planting desired species between fields. Collectors gather medicinal plants in the wild, usually in forests or alpine meadows.

Traders are agents involved in purchasing medicinal plants from harvesters: they consolidate large numbers of small sales into large lots for sale to wholesalers (bulking up). Sub-local traders are based in villages, usually beyond the road network. They are commonly known in the literature as village traders; however, their catchment area (the area from which they buy medicinal plants) usually extends to several Village Development Committees (the smallest local administrative unit). Local traders, commonly known as road head traders or district traders in Nepal, are stationed at the interface between porterage and road transport. Their catchment area usually covers 1–3 districts and they trade much larger amounts than sub-local traders. Traders generally do not export medicinal plant products.

Wholesalers are the agents who usually buy and sell wholesale. The central wholesalers buy from traders and sell to regional wholesalers; they are located in the Terai or in Kathmandu. They are often called Terai traders in Nepal. The regional wholesalers buy from central wholesalers and sell to intermediaries, such as producers of traditional medicine, or retailers mainly in India (bulk breaking); they are positioned in the Indian cities on the Gangetic plain.

The sub-types are divided into 13 specific types. The key features of the specific types are presented in Table 2.

Collectors are distinguished by the degree of collection intensity: their main purpose vs a sideline activity in connection to other work. Both dedicated and opportunistic collectors are common; the nature of collection depends on harvesting location and on the product.

Domesticators are distinguished by the degree of agricultural intensity: active cultivation vs more passive integration into existing agricultural patterns. The literature indicates that domesticators are becoming more common at lower and middle altitudes. Hertog and Wiersum (2000) provide a detailed case study of the development of community management of *Zanthoxylum armatum* DC in mid-western Nepal. It has been argued that the move from collection in the wild to some form of domestication is a local-level response to resource degradation and commercial opportunities (Olsen 1997; Hertog and Wiersum 2000).

TABLE 1 Typology of economic agents in medicinal plant trade in the Himalayas.

Type	Sub-type	Specific type
Harvester	Collector	Opportunistic
		Dedicated
	Domesticator	Adaptive
		Commercial
Trader	Sub-local	Itinerant
		Permanent
	Local	Specialist
		Generalist
Wholesaler	Central	Specialist
		Generalist
	Regional	Commission
		Ordinary
		Combined

Sub-local traders are distinguished by mobility. Most traders have a permanent presence in their catchment area, eg a shop or just their own house. The use of advance payments to harvesters is common in some parts of the country, while not found in other parts. Itinerant traders travel from village to village, and from district to district, usually beyond the road network. They are not common, and usually focus on purchasing products of very high value such as *Cordyceps sinensis* (Berk.) Sacc. Further distinction between sub-local traders is possible, eg on the basis of how they maintain relations with harvesters.

Local traders and *central wholesalers* can both be divided into 2 groups, according to the nature of their business: those dealing exclusively in medicinal plants, and those dealing with medicinal plants as part of a more diversified business. The latter is by far the most common. Both offer the same services.

Regional wholesalers are divided according to whether they act as commission agents or not. A third group is made up of wholesalers that do both or are vertically integrated with production companies, for example. Regional wholesalers are commonly known as Indian wholesalers in Nepal.

Downloaded From: https://bioone.org/journals/Mountain-Research-and-Development on 29 Mar 2024
Terms of Use: https://bioone.org/terms-of-use

TABLE 2 Key features of specific types of economic agents involved in Himalayan plant trade (divided by bold lines according to sub-types).

Specific type	Key features
Opportunistic collector	Undertakes collection along with other activities, eg high altitude herders.
Dedicated collector	Undertakes collection as specific main activity, eg in small groups traveling to remote areas with the primary purpose of collecting.
Adaptive domesticator	Plants or transfers natural regeneration, and protects medicinal plant species between agricultural fields. Usually at lower altitudes.
Commercial domesticator	Cultivates medicinal plant species on agricultural land in smallholder plantations or in home gardens. Only found at lower altitudes.
Itinerant sub-local trader	Moves from village to village beyond the road network; usually covers many districts. Often focused on selected high-value products. Harvesters always actively contacted. Rare.
Permanent sub-local trader	Permanent presence. May or may not receive or distribute advances; harvesters may be contacted actively or passively. May act as broker or commission agent. Common.
Specialist local trader	Located in or near district of origin; average catchment area of 1–3 districts. Trading exclusively in medicinal plants. Rare.
Generalist local trader	Located in or near district of origin; average catchment area of 1–3 districts. Trading a number of items besides medicinal plants. Common.
Specialist central wholesaler	Located in country of origin; average catchment area of 2–6 districts. Trading exclusively in medicinal plants. Rare.
Generalist central wholesaler	Located in country of origin; average catchment area of 2–6 districts. Trading a number of items besides medicinal plants. Common.
Commission regional wholesaler	Located in India; national level catchment area. Facilitates fee-based sale of central wholesalers' products.
Ordinary regional wholesaler	Located in India; national level catchment area. Buys products directly from central wholesalers.
Combined regional wholesaler	Located in India; national level catchment area. Acts as a combination of at least two of the following: ordinary wholesaler, commission wholesaler, wholesaler vertically integrated with production companies or retailers.

Basic data on economic agents

Holley and Cherla (1998), in their review of the medicinal plant sector in India, emphasize the need to investigate the social and economic profiles of the participating economic agents. No studies of this are available. Based on the nation-wide survey, basic characteristics are presented here for the harvester and trader types, and the central and regional wholesaler sub-types (Table 3).

Characteristics of harvesters

Almost one-fourth (23.5%) of the harvesters are female; women are involved in harvesting of commercial medicinal plants and participate in marketing of the household harvest. The average age of a harvester is 38.8 years, with very few above 50 years and a relatively small proportion of younger people below 30 years. On average, a harvester has gathered commercial medicinal plants for 7.9 years; and the average number of focal products harvested is 1.9. The average annual income from medicinal plant harvest and sale is USD 40.3 ± 23.5.

In addition, the mode of harvesting for the focal products was registered in 568 cases. The frequency of harvest in the wild was 75.9%, from domesticated plants 14.4%, and from both 9.2%. More than 90% of harvesting was discrete. The location of harvesting was also registered in the 568 cases; most harvesting was done on government land (74.1%), followed by private land (14.7%), both private and government land (9.4%), and communal land (2.2%). Finally, it was noted that the educational level of harvesters is low: literacy is only 36.9%, while the national average is 39.6% (CBS 1995).

Downloaded From: https://bioone.org/journals/Mountain-Research-and-Development on 29 Mar 2024
Terms of Use: https://bioone.org/terms-of-use

TABLE 3 Basic characteristics of economic agents in Himalayan plant trade.

Factor	Harvester (n=639)	Trader (n=149)	Wholesaler (n=143)	
			Central (n=90)	Regional (n=53)
Gender (%)				
Male	76.5	100.0	100.0	100.0
Female	23.5	0.0	0.0	0.0
Age (years)				
Average ± sd	38.8 ± 7.3	43.1 ± 7.9	44.9 ± 8.6	42.6 ± 8.0
≤ 30	15.7%	4.7%	5.6%	5.7%
31 – 40	43.1%	35.6%	25.6%	34.0%
41 – 50	37.0%	38.9%	40.0%	45.2%
> 50	4.2%	20.8%	28.9%	15.1%
Years of experience				
Average ± sd	7.9 ± 3.1	10.7 ± 6.9	12.7 ± 7.2	13.4 ± 4.1
≤ 2	1.3%	2.0%	0.0%	0.0%
3 – 5	19.0%	21.5%	5.9%	0.0%
6 – 10	61.4%	35.6%	47.1%	38.5%
> 10	18.3%	40.9%	47.1%	61.5%
Number of focal products	1.9 ± 0.3	7.1 ± 3.8	7.0 ± 4.1	9.8 ± 6.7
Average values[a] per agent	**Sales[b]**	**Purchases[c]**	**Purchases[c]**	**n.a.**
Mean ± sd	40.3 ± 23.5	10,050 ± 13,227	47,700 ± 51,898	
Min	4.4	382	882	
Max	124.6	95,588	336,250	
Skewness	1.18	3.17	3.08	
Concentration ratio[d] C_4	2.0%	17.7%	21.6%	n.a.

[a] All values in USD in case year 1997/98. USD 1 = approximately 68 Nepalese Rupees.
[b] Average annual income per harvester, n=588. Excludes two outlying values of 1147.1 and 622.1.
[c] Average annual expenditure per agent to purchase medicinal and aromatic plant products.
[d] The four firm concentration ratio, C_4, is an industry concentration benchmark measuring the percentage of market share captured by the four largest firms in an industry (Scherer and Ross 1990).

Characteristics of traders

All traders are male. The mean age is 43.1 years, and most have more than 10 years' experience in trading medicinal plants. The average number of focal products traded is 7.1. The level of involvement in the medicinal plant trade varies widely: the average annual expenditure to purchase these plants is USD 10,050 ± 13,227. The four firm concentration ratio indicates that some traders may have influential positions in the market. Furthermore, it was noted that a trader is supplied by between 25 and 4000 harvesters with an average of 355.4 ± 459.3 harvesters. Most traders have some basic education (87.9% have a primary or secondary education or a school-leaving certificate), while 10.7% have a university education.

Characteristics of wholesalers

Data collection provided information on both the central wholesaler and regional wholesaler sub-types.

Central wholesalers are all male. Age distribution is similar to that for traders. Most central wholesalers have

Downloaded From: https://bioone.org/journals/Mountain-Research-and-Development on 29 Mar 2024
Terms of Use: https://bioone.org/terms-of-use

been trading in medicinal plants for more than 12 years; only 5.9% have less than 6 years' experience. The average number of focal products traded is 7.0. The annual average expenditure varies widely: USD 47,700 ± 51,898, with the 4 largest traders covering almost 22% of total annual purchases. Many central wholesalers have no education (23.3%), although most have some basic education (58.9% primary, secondary or school-leaving certificate), and 17.8% a university education, usually a bachelor's degree. Also, 40.0% of the wholesalers registered their business as dealing in medicinal and aromatic herbs, 51.1% registered their firms as dealing with other goods (only a few firms deal exclusively with medicinal plants), and 8.9% were not registered at all. The average number of supplying districts was 4.3 ± 1.8.

Regional wholesalers are all male. The mean age and years of experience in trading medicinal plants are comparable to those for the central wholesalers. None of the regional wholesalers have less than 6 years' experience in trading medicinal plants, and 61.5% have more than 10 years' experience. As expected, given the larger catchment areas of regional wholesalers, the average number of traded focal species, 9.8, is higher than for the central wholesalers. Only 5.7% have no education, 9.4% have a school-leaving certificate, and 84.9% a university-level education. Only 1.9% function as ordinary regional wholesalers, 32.7% are commission regional wholesalers, and 65.4% are combined regional wholesalers. The latter can be divided into 4 groups: 61.8% are combined ordinary and commission wholesalers, 14.7% combined processor and commission wholesalers, 11.8% retailer and commission agents, and 11.8% processor, ordinary and commission wholesalers.

Discussion

The literature review clearly indicates the need for development of common terminology for description of the Himalayan plant trade. Holley and Cherla (1998) argue that there are 5 main categories of actors: collectors, petty traders, private agents, wholesale dealers, and finally consumers. As is obvious from the sections above, it is both possible and desirable to use empirical data to develop such classifications to make them more operational and accurate.

The typology developed describes key features of types, sub-types and specific types of economic agents involved in the Himalayan plant trade. This provides the basis for a common terminology that can be applied throughout the countries in the Himalayan range. The most frequent specific types of economic agents are dedicated collectors, permanent sub-local traders, generalist local traders, generalist central wholesalers, and combined regional wholesalers. However, it should be kept in mind that market structure, and thus economic agents, may be affected by a large number of impacts such as price or tenure changes. These impacts may be produced by both macro-level changes, such as producer countries joining the World Trade Organization, and micro-level changes, such as demand shifts due to new consumer preferences. For instance, it may be argued that a persistently high price for a product that is becoming increasingly scarce will lead to domestication initiatives and thus increase the number of adaptive domesticators. And this process would be enhanced if production were moved from open access and common property resources to private land. This would not lead to the emergence of new specific types, but rather shift trade and profits between existing specific types. Likewise, interventions in the trade, such as those proposed by Larsen et al (2000), would not lead to new types of economic agents. Therefore, the typology is evaluated as robust and hence useful, even in the longer term.

The typology should contribute to a more structured approach to investigating medicinal plant and non-timber forest product trade in the future. Besides the advantage of promoting comparable studies, it also serves to focus on specific types of economic agents—this will hopefully lead to increased understanding of agent dynamics. Examples of information that would increase the understanding of central wholesaler dynamics, if investigated systematically, are: reasons for being in the medicinal plant business, previous occupation, and primary income earning activity.

In general, it is possible to further develop the classification by providing more in-depth information on the economic agents. For instance, the above characteristics of central wholesalers can be expanded to include analysis of ethnicity. And analysis can be taken one step further by combining analysis of basic features with detailed information on the value and volume of trade at the level of individual agents. Much work remains to be done on developing the basic characteristics of economic agents at all levels, including economic agents excluded from this analysis, such as processors and end users. Furthermore, it would be possible to develop a complete typology for all actors—not just economic agents—with a stake in Himalayan plant trade by expanding the classification to include the actors identified by Larsen et al (2000), eg lower-level government staff.

Conclusions

The trade in plants from the Himalayas is huge and the number of trade studies in the region has increased rapidly in the past decade. However, due to lack of common terminology and methodology, it remains difficult, if not impossible, to compare studies. The present

Downloaded From: https://bioone.org/journals/Mountain-Research-and-Development on 29 Mar 2024
Terms of Use: https://bioone.org/terms-of-use

paper has presented a typology of economic agents that is expected to be applicable across the countries in the Himalayan range. The typology provides the basis for standardizing future trade studies, thus enabling comparisons between countries and products. Furthermore, the typology provides the foundation for constructing a typology that includes all actors related to the Himalayan plant trade; this could lead to a terminological framework that would enable comparison between non-trade studies, eg policy analyses. This would allow researchers to start painting a common picture of commercial plant utilization in the Himalayas.

AUTHORS

Carsten Smith Olsen
The Royal Veterinary and Agricultural University, Centre for Forest, Landscape and Planning, 1958 Frederiksberg C, Denmark.
cso@kvl.dk

Nirmal Bhattarai
Bhattarai Niwas, Ghattekulo Marga, Dillibazar, PO Box 20568, Kathmandu, Nepal.
mansa@ccsl.com.np

ACKNOWLEDGMENTS

The Council for Development Research of the Danish Ministry of Foreign Affairs financed this research. We thank the many harvesters, traders and wholesalers who participated in the study. Helle O. Larsen and Niels Strange at the Danish Centre for Forest, Landscape and Planning in Copenhagen and two anonymous referees are thanked for their comments on the draft manuscript.

REFERENCES

ANSAB [Asia Network for Sustainable Agriculture and Bioresources]. 1997. *Nepal NTFP Entrepreneurs' Directory.* Kathmandu, Nepal: ANSAB.

Aumeeruddy-Thomas Y, Lama YC, Ghimire SK. 2002. Health care development and medicinal plants conservation at Shey Phoksundo National Park, Nepal. *In:* Bhattarai NK, Karki M, editors. *Sharing Local and National Experience in Conservation of Medicinal and Aromatic Plants in South Asia.* Delhi, India: International Development Research Centre, pp 71–92.

Burbage MB. 1981. *Report on a Visit to Nepal: The Medicinal Plant Trade in the KHARDEP Area—A Study of the Development Potential.* London, UK: Natural Resources Institute.

CBS [Central Bureau of Statistics]. 1995. *Population Monograph of Nepal.* Kathmandu, Nepal: CBS.

CECI [Canadian Centre for International Studies and Cooperation]. 1999. *Sub-sector Analysis of High Altitude NTFPs in the Karnali Zone. Vol I: Main Report.* Kathmandu, Nepal: CECI.

Edwards DM. 1996. The trade in non-timber forest products from Nepal. *Mountain Research and Development* 16:383–394.

Farooquee NA, Saxena KG. 1996. Conservation and utilisation of medicinal plants in high hills of the central Himalayas. *Environmental Conservation* 23:75–80.

Hertog W, Wiersum KF. 2000. Timur (*Zanthoxylum armatum*) production in Nepal: Dynamics in non-timber forest resource management. *Mountain Research and Development* 20:136–145.

Holley J, Cherla K. 1998. *The Medicinal Plants Sector in India*. Delhi, India: The International Development Research Center, South Asia Regional Office, Medicinal and Aromatic Plants Programme in Asia.

Larsen HO, Olsen CS, Boon TE. 2000. The non-timber forest policy process in Nepal: Actors, objectives and power. *Forest Policy and Economics* 1:267–281.

Malla SB, Shakya PR, Rajbhandari KR, Bhattarai NK, Subedi MN. 1995. *Minor Forest Products of Nepal: General Status and Trade.* FRIS Project Paper No 4. Kathmandu, Nepal: Forest Resource Information System Project.

Mulliken TA. 2000. Implementing CITES for Himalayan medicinal plants *Nardostachys grandiflora* and *Picrorhiza kurrooa*. *TRAFFIC Bulletin* 18(2):63–72.

Murty TK. 1993. *Minor Forest Products of India.* Delhi, India: Oxford and IBH.

Nawang R. 1996. Medicinal plants. *In:* FAO [United Nations Food and Agriculture Organization], editor. *Non-wood Forest Products of Bhutan.* RAP Publication 1996/6. Bangkok, Thailand: FAO, pp 21–42. Also available at http://www.fao.org/docrep/X5335e/x5335e00.htm#Contents; accessed on 2 September 2004.

Olsen CS. 1997. *A Qualitative Assessment of the Sustainability of Commercial Non-timber Forest Product Collection in Nepal.* Forestry Discussion Paper 12. Copenhagen, Denmark: The Royal Veterinary and Agricultural University.

Olsen CS. 1998. The trade in medicinal and aromatic plants from central Nepal to northern India. *Economic Botany* 52:279–292.

Olsen CS. In press. Quantification of the trade in medicinal and aromatic plants in and from Nepal. *Acta Horticulturae*, 2004.

Olsen CS, Helles F. 1997. Medicinal plants, markets and margins in the Nepal Himalaya: Trouble in Paradise. *Mountain Research and Development* 17:363–374.

Olsen CS, Larsen HO. 2003. Alpine medicinal plant trade and Himalayan mountain livelihood strategies. *Geographical Journal* 169:243–254.

Scherer FM, Ross D. 1990. *Industrial market structure and economic performance*. Boston, MA: Houghton Mifflin.

Schippmann U, Leaman DJ, Cunningham AB. 2002. Impact of cultivation and gathering of medicinal plants on biodiversity: Global trends and issues. *In:* FAO [United Nations Food and Agriculture Organization], editor. *Biodiversity and the Ecosystem Approach in Agriculture, Forestry and Fisheries.* Rome, Italy: FAO.

Sharma P. 1995. Non-wood forest products and integrated mountain development: Observations from Nepal. *Non-Wood Forest Products* 3:157–166.

Skinner GW. 1964. Marketing and social structure in rural China. Part 1. *Journal of Asian Studies* 24:3–43.

Skinner GW. 1965. Marketing and social structure in rural China. Part 2. *Journal of Asian Studies* 24:195–228.

Subedi BP, Bhattarai NK. 2002. Community managed enterprise: Participation of rural people in medicinal and aromatic plants conservation and use. *In:* Anonymous, editor. *Medicinal Plants: A Global Heritage*. Delhi, India: International Development Research Centre, pp 251–257.

Downloaded From: https://bioone.org/journals/Mountain-Research-and-Development on 29 Mar 2024
Terms of Use: https://bioone.org/terms-of-use