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Source: Mountain Research and Development, 24(2) : 141-148

Published By: International Mountain Society

URL: https://doi.org/10.1659/0276-4741(2004)024[0141:SPOCMP]2.0.CO;2

Mountain Research and Development Vol 24 No 2 May 2004: 141–148

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Poverty and Resource Degradation

The present article reports the results of a survey on the views of persons involved in commercial alpine medicinal and aromatic plant (MAP) exploitation and conservation in Nepal. Open-ended questionnaires were administered face to face to 175 respondents in the following categories: 1) collectors, 2) traders, 3) district forest office staff, 4) staff at the departmental and ministerial levels in the Ministry of Forests and Soil Conservation, and 5) (I)NGOs and donors. The issues explored are related to striking a balance between poverty alleviation and halting MAP resource degradation. Stakeholder beliefs about the benefits derived from MAPs, the current state of the MAP resource, the tenure of MAP pastures, the effectiveness of government bans on collection and the possibility of community management, and the trade-off between collection and conservation are presented. Widespread misconceptions about collectors and local management are identified, and implications of differences in belief among stakeholder categories are discussed. The main findings show that collectors are seen as gaining important financial benefits from MAPs, but that 71% of non-collecting respondents believe the MAP resource to be degraded. Most stakeholders, other than district forest office staff, favor collection over conservation, and find that current collection bans are inefficient, indicating the potential for addressing village poverty by, for example, changing the present centrally-based regulation mechanisms and handing over some MAP resources for community management.

Keywords: *Medicinal plants; Himalaya; NTFPs; rural development; natural resource use; conservation; Nepal.*

Peer reviewed: *January 2004* ***Accepted:*** *February 2004*

Introduction

The present article is concerned with commercially collected high-altitude (above 3000 m) medicinal and aromatic plants (MAPs) from the Nepalese Himalayas. High-altitude MAPs are mainly collected from alpine meadows in remote areas of Nepal by local inhabitants, who sell their dried and cleaned products to registered contractors, typically within the district of origin (Figure 1). Products pass through several middlemen and about 90% end up in India, probably in the cosmetic and medicine industries (Edwards 1996a; Olsen and Helles 1997). Eight alpine and sub-alpine MAP species (*Aconitum heterophyllum* Wall. ex Royle, *Aconitum spicatum* (Brühl) Stapf, *Bergenia* spp., *Dioscorea deltoidea* Wall. ex Griseb., *Morchella* spp., *Nardostachys grandiflora* DC, *Neopicrorhiza scrophulariiflora* Pennel D.Y. Hong, and *Rheum australe* D. Don) and one mineral constitute the bulk of high-altitude exports from Nepal to India. In the Nepalese 1997–98 fiscal year, trade was estimated at 1620 tons, with an export value of US$ 2.3 million (Olsen and Larsen 2003).

Because of their contribution to the economy and their delicate ecology, MAPs are a priority area for research and policy. It is feared that growth and regeneration in alpine habitats are too slow to compensate for collection. In the beginning, research efforts were channeled towards plant and product identification (Singh et al 1979). Attention then turned to production potential and scrutiny of marketing channels (Pradhan and Maharjan 1994). Later, equity concerns entered the debate, reflecting the desire to alleviate poverty among poor collectors. It has been questioned whether the latter receive a fair share of the revenues accruing from MAPs sold to India (Edwards 1996a). As early as 1979, Nepalese scientists were concerned with the sustainability of commercial collection of plants from the wild (Singh et al 1979). The questions of resource degradation and poverty alleviation are among the most debated issues related to commercial MAP exploitation today (eg HMG 2002).

Current Nepalese MAP policies seek an equilibrium between conservation and utilization by focusing on sustainable collection through mandatory regulations. Since 1995, permits specifying species, quantities, and location have been required for commercial collection, and collection bans have been imposed on species considered particularly vulnerable (HMG 1995). There are, however, criticisms of the motives behind and the effectiveness of the current policy (Kanel 2000; Larsen et al 2000). New ideas about the use of community-based management are also being floated (Edwards 1996b). Understanding the extent and causes of MAP degradation, as well as the benefits and the dissemination of these benefits, is essential to choosing efficient policy tools.

Methodology

This study is a stakeholder analysis that seeks to gain understanding of MAP collection by exploring the views of key actors on aspects of poverty and resource degradation (Grimble and Chan 1995). It focuses on commercial collection of alpine MAPs, which often have a higher value per unit than MAPs at lower altitudes (Edwards 1996a). Information was collected from local-level stakeholders in the mid-western, western, and cen-

FIGURE 1 Collectors of alpine medicinal and aromatic plants (MAPs) in Gorkha District. (Photo by Carsten S. Olsen)

tral development regions of Nepal, and from individuals at the national and international levels in Kathmandu (Figure 2). Overall, 5 categories of stakeholders were identified on the basis of previous studies (Olsen and Helles 1997; Larsen et al 2000):

1. Collectors from 8 Village Development Committees (VDCs, the within-district administrative unit comprising 2000–15,000 inhabitants) of Gorkha District were approached in villages or on the road;
2. Road head and wholesale traders in Banke, Dang, Dhading, Gorkha, Kathmandu, and Palpa districts were identified through key informants and ANSAB (1997);
3. District forest office (DFO) staff in Baglung, Dhading, Gorkha, Kaski, Lamjung, Manang, and Myagdi districts were approached at or near their offices;
4. Staff at various departments and the ministerial level of the Ministry of Forests and Soil Conservation (MFSC) were approached at the department and ministry offices; and
5. International and national non-governmental organizations ([I]NGOs) and donors with an interest in MAP exploitation were identified on the basis of publications and key informants, and approached at their offices.

A total of 175 questionnaires, 35 in each stakeholder group, were administered. Because snowball sampling and key informant approaches were used in the selection of respondents within the 5 groups (Rea and Parker 1997), analytical rather than statistical generalizations are possible (Kvale 1996).

To enable comparison of views between different stakeholder groups, an open-ended questionnaire was administered to respondents individually, face to face. The main topics included were: state of the resource, collection, management, regulation, and conservation. When eliciting a respondent's perception of a topic, clarifying and reflecting questions were asked to validate the interpretation and improve the interviewer's understanding. Additional topics introduced by the respondents were included in analysis of the answers. The open-ended questionnaires therefore largely resembled semi-structured interviews (Kvale 1996).

A number of general issues may have shaped respondents' perceptions. The MAP trade in Nepal is renowned for its secrecy (Aryal 1993), and dealings along the market chain are said to be subject to rent-seeking (Kanel 2000). Therefore, respondents may have framed their answers in accordance with hidden agendas. In addition, respondents may have lacked personal

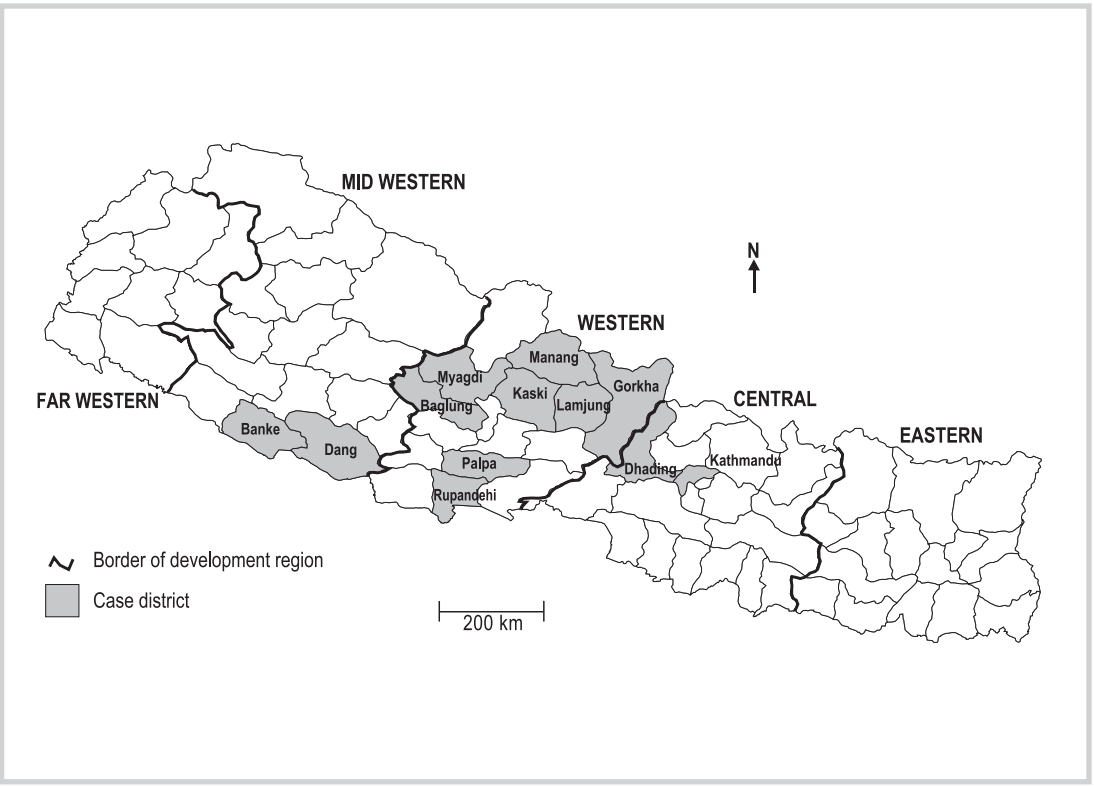

FIGURE 2 Map of study area. Questionnaires were administered in the districts marked with gray shading. (Map by Morten Christensen)

experience or accurate information on aspects of MAP utilization. In fact, given the lack of honest communication between different groups and the lack of scientific MAP data, many differences between respondents' perceptions can be explained by lack of specific knowledge and reliance on stereotypical beliefs about the nature of reality. This study does not seek to present "*the* truth" but rather the broad range of "truths" among stakeholders (Thompson et al 1990). The impacts of hidden agendas and differentiated knowledge are further explored in the concluding discussion. Although the number of respondents was relatively large, the study cannot claim to provide a full picture of perceptions on MAP collection, trade, and conservation. Collectors are especially diverse, and perceptions will vary according to the nature of the specific MAP resources being exploited, as well as other location-specific features.

Results

Poverty: What are the benefits of MAPs and who gets them?

Respondents were asked to enumerate the benefits of MAPs and to rank them according to importance. All stakeholders, except traders, saw the benefits of MAPs accruing primarily to the rural population. From the traders' point of view, the most important benefit was their own profit. Members of the other stakeholder categories thought medicine and local income were the 2 most important benefits, followed by biological values (eg biodiversity) (Table 1). MAPs were not widely perceived to be related to national income, or to cultural or religious issues.

Most inhabitants in all villages visited in Gorkha District collect MAPs for medicine, or make use of locally collected medicinal plants, and many households have at least 1 person collecting for income generation. Commercial collectors tend to be male, relatively young, and frequently shepherds. Villagers are reluctant to admit they collect MAPs: as one person said, "yes, *jaributi* [medicinal plants] are important, everybody here collects—but I don't really do it… shepherds collect." One reason for this reluctance to admit collecting is that collectors are unsure of official collection rules and fear punishment. Another reason is that MAP collection is not a prestigious activity—it is something done only by poorer village inhabitants; few of the wealthier families in a village collect.

The economic impacts of MAP collection vary. One person stated, "I use the money [from MAPs] to buy chili and sometimes salt. It is not rice money we get from *jaributi*, it is actually not much." Research from one village in Gorkha District shows that income from collection and sale of alpine MAPs ranges from 3 to 44% (on average US$ 46.00) of the annual cash income of households engaged in collection (Olsen and Larsen

TABLE 1 Questionnaire responses by stakeholder group and for all respondents.

Issue \ Respondents	Collectors	Traders	DFO staff	MFSC staff	(I)NGOs	All respondents
Benefits from MAPs (ranked by importance within stakeholder groups[a,b])						
Medicine	**1**	**3**[c]	**1**	**1**	**2**	
Local income	**2**	**2**[c]	**3**	**2**	**1**	
Biological diversity			2		3	
Culture				3	4	
National income			4	4		
Research					5	
Religion					6	
Traders' profit		1				
State of the MAP resource (% of stakeholder respondents[d])						
Degraded	43	**49**	**83**	**86**	**66**	**65**
Not degraded	**57**	**29**	6			18
Need more info				14	23	7
Location-specific		14			9	5
Don't know		9	11		3	5
MAP tenure (% of stakeholder respondents[d])						
Open-access		29	**86**	**83**	**51**	**50**
Local management	**100**	40	9	9	34	38
Location-specific		23			9	6
Don't know		9	6	9	6	6
Should the MAP resource be handed over as in the case of Community Forests? (% of stakeholder respondents[d])						
Yes	14	29	**49**	**91**	**89**	**54**
No	**40**	14	43	9	11	23
Don't know	46	57	9			22
MAP collection versus conservation (% of stakeholder respondents[d])						
Conservation	29	20	**71**	9	0	26
Collection	**71**	**57**	17	**57**	**51**	**51**
Cannot answer		23	11	34	49	23
Do bans work to protect the MAPs? (% of stakeholder respondents[d])						
Yes	6	9	20	17	17	14
No	**71**	**86**	**69**	**71**	**69**	**73**
Don't know	23	6	11	11	14	13

[a] Respondents ranked benefits in order of importance. Rank scores for each benefit were summed across all respondents in each category. The benefit with the highest sum in each category was given the value 1.

[b] Benefit categories were developed on the basis of respondents' answers.

[c] The benefit was only mentioned after probing by the interviewer.

[d] The sum of percentages for a stakeholder group may differ from 100 due to rounding off.

2003). Even considering this variation in benefit level, all stakeholders agree that MAP collection is one among few income-generating activities in the remote areas, and that this makes it extremely important from the perspective of rural livelihood. (I)NGO respondents also feel MAPs are an "intrinsic part of mountain livelihoods," with bearing on both culture and religion, and that benefits in terms of research must not be overlooked.

To sum up, the main benefits of the MAP resource mentioned by stakeholders were medicine and local income. Collection activities employ young men and help to reduce village poverty. This means that halting local harvesting in order to conserve MAPs might increase poverty. However, is reduced harvesting necessary? Are MAP resources degraded?

Degradation: What is known and what is believed about the state of the MAP resource?

Up to now no national-level inventory has estimated the stock of the Himalayan MAP resource, and the sampling designs of local inventories have been based on prior knowledge of plant presence in specific areas (CECI 1997; Airi et al 2000; Larsen 2002). Thus instead of relying on observational field data, policy making has generally been based on stakeholder perceptions of the state of the resource. In this study, respondents were asked how they assessed the availability of the MAP resource as compared to earlier. If the answer indicated a decrease, this was classified as "degraded." A majority of the respondents (65%) said the resource was degraded, 18% said that it was not degraded, and 17% said that degradation depends on location and species, that they need more information to form an opinion, or that they do not know (Table 1).

Forty-three percent of the collectors consulted felt the resource was degraded, although their beliefs about the extent of degradation varied. Most older collectors who no longer collect say the resource is degraded today as compared to earlier: "When I used to collect you could find *panchaunle* [*Dactylorhiza hatagirea*, a valuable MAP species of which collection is banned due to fear of extinction] everywhere; we used to collect 2 *dharni* [about 5 kg] in one day… Today there is nothing, it is all gone." The people who collect MAPs today say that they can collect as much today as in previous years, but that in some cases they have to spend more time to collect the same amount, and that in future there may be scarcity if many more people start to collect in the same places. Fifty-seven percent of the collectors consulted believe the MAP resource is no more degraded than it was earlier, but both old and young collectors share the fear of future degradation.

Most of the DFO, MFSC, and (I)NGO respondents believe the MAP resource is degraded. The DFO staff is convinced that this is so, as no management is taking place: "Technically we can say there is no management, people just collect, then definitely there is degradation." The need for government regulations also implies degradation: "Yes, the *jaributi* resource is definitely degraded. I am not directly involved but I know some species are banned, and that means there is degradation when government puts such bans."

None of the DFO respondents consulted had visited alpine collection areas to get a first-hand impression. About 20% of MFSC respondents, and 40% of (I)NGO respondents, had visited the alpine collection areas. Often these two groups base their belief in general degradation on "collectors' unscientific harvesting methods" and evidence of increasing Indian export of plant-based products, and hence increasing demand for raw materials. Opinions among MFSC and (I)NGO respondents are more qualified than among other respondent categories, some of the former arguing that insufficient information is available on which to base conclusions. Six percent of the DFO staff and 29% of the traders are the only stakeholders besides collectors who say that the MAP resource is not declining, but none of these had visited the collection areas.

Degradation is thought by all respondents to be a result of collectors' over-exploitation. Collectors are said to collect before seed maturation and to collect all individuals of a given plant population. These harmful practices are said to be induced by lack of property rights, ignorance, or poverty. Degradation is also blamed on the government, which is said to be inefficient in management and monitoring; on the DFO staff, who are said not to teach collectors how to collect sustainably; on traders, who demand large amounts of MAPs without consideration of how products are collected; on (I)NGOs and donors, who encourage collection beyond biological capacities; on grazing pressure; and on the lack of a "scientific management system." Scientific management is often mentioned by the DFO, MFSC and (I)NGOs, by which they mean collection methods and intensities allowing for regeneration of the resource in the wild, cultivation, and ex situ conservation.

Degradation: Are MAPs open-access?

It is well documented that users of a common pool resource can organize to manage it sustainably, but that among other things this requires clearly defined boundaries in terms of both resource and user group (Ostrom 1990; Bromley 1992). In Nepal communal forest management has been recognized as a viable alternative to centralized management, and institutionalized under the Community Forestry scheme (Gilmour and Fisher 1991). Alpine MAPs, on the other hand, are generally considered an open-access resource subject to uncontrolled collection (Pandit and Thapa 2003; HMG 2002).

The collectors themselves say they have control over access. All collectors in Gorkha District say that each VDC has its own alpine area for grazing and MAP collection. The origins of these rights are not remembered; collectors say they came before the *panchayat* system, and they are not always based on the official boundaries. (*Panchayats* were administrative units under the previous political system from 1960 to 1990. VDCs were introduced in 1990 and generally have the same boundaries as *panchayats*.) The boundaries of the alpine areas are well defined. A collector typically knows the boundaries of his own and at least the neighboring VDCs. If a person from one VDC wishes to collect MAPs in the alpine area of another, he has to pay a royalty, depending on the amount collected. Although monitoring of the large alpine area is difficult due to the limited presence of people, if clandestine collectors are caught they are fined and the collected MAPs are confiscated. People from other VDCs can also pay to bring their sheep to VDCs with larger alpine grazing areas, and it is suspected that the shepherds collect MAPs without notifying the host. Despite this potential problem, collectors claim to have a system of MAP property rights which works well, given the intrinsic difficulty of monitoring a remote resource.

Traders are divided on the issue of tenure, but most believe that MAPs are open-access resources. The basis for this opinion is considered weak. Traders say that they do not ask collectors where the products come from, and that they have not really thought about this. The DFO and MFSC staff, and about half of the (I)NGO respondents, also say that MAPs are an open-access resource. The former two say that alpine MAPs grow on land classified as national forest, and, because no hand-over has taken place, there must be no local management. There is a clear feeling that management has to be endorsed by the DFO to be valid, as stated by an MFSC respondent: "In some places there is extra-legal local management of access rights." The (I)NGO respondents generally believe that any local management that may have once existed has succumbed to rapidly increasing market demand and the right of the district forest officer to issue collection permits on national land without consulting the rural population. The relatively few DFO, MFSC, and (I)NGO respondents (17%) who said that local institutions regulate access to the alpine areas were often born or had worked in remote areas of Nepal. They also emphasized that local institutions only regulate access, not collection practices. Other respondents said that since MAP collection is a very old undertaking, some local regulation must have emerged.

It is noteworthy that although 50% of all stakeholders believe that alpine pastures are an open-access resource today, more than half also believe handing over the resource under the Community Forestry scheme would be a good idea, in order to pursue both development and conservation (Table 1). Among all stakeholders, collectors are the ones most in doubt about the benefits of legally endorsed community management. In their opinion they have de facto control over the MAP resource now. They prefer to keep contact with authorities to a minimum, and generally fail to see any benefits from involving the DFO in their MAP exploitation. Forty-three percent of the DFO respondents oppose the idea of handing over the MAP resource, as they believe collectors are not able to manage it sustainably. MFSC and (I)NGO respondents are largely in favor of legalizing community management, believing that if collection is not sustainable now, it will become so when an incentive is provided in terms of tenure.

Perhaps one reason for the support of formal communal management by MFSC and (I)NGO respondents is the widespread sentiment (73% of all respondents) that collection bans have failed. At the time of the survey, the Nepalese government had instituted bans on collection of the MAPs *Dactylorhiza hatagirea* (D. Don) Soo and *Cordyceps sinensis* (Berk.) Sacc. (a fungus parasitizing a caterpillar), as well as on the unprocessed export of a number of MAPs, eg *Nardostachys grandiflora* DC. The evidence for the ineffectiveness of these bans is that respondents say they either collect, trade, or have knowledge of collection and trade of these species taking place. Some explain that they think this occurs because people collect what they can sell, and it is difficult for the DFO staff to prevent it.

The lack of results from collection bans and the existence of local MAP tenure systems may explain the support for handover to community management. However, the mere presence of local institutions is not thought to guarantee sustainable management, as the widespread fear of present or future resource degradation mentioned above illustrates. Harvesting, whether as part of a closed- or open-access resource, is seen as the principal cause of degradation. This raises the central dilemma of much natural resource management: the relative importance of harvesting, which is a poverty alleviation concern, versus protection, which is a degradation concern.

Poverty versus degradation: The ideal balance between protection and harvesting of MAPs

Stakeholders were asked to choose between collection and conservation in a hypothetical case. Where collectors had to collect MAPs to earn their livelihood, resource destruction was sure to follow from collection, and conservation could be successfully carried out by strict government control of the resource. Most of the respondents from all stakeholder categories other than DFO staff gave priority to collection over conservation

(59%) or said they could not answer (26%). In particular, (I)NGOs and MFSC often prefer not to answer, arguing that a complex situation cannot be reduced to a choice between two alternatives. A common assumption of those favoring collection is that they think total resource destruction unlikely because there would be alternate harvesting locations. Others simply say the economic needs of the poor must override all other considerations, as an MFSC respondent stated: "It is easy to argue preservation from the office; if I have to eat I certainly don't care!" In contrast, most DFO respondents favor conservation (71%): "Once it is destroyed it is gone forever." Some DFO respondents said that collection would always degrade the resource, whereas others saw the theoretical possibility of sustainable collection, but said that collector greed and ignorance currently make this impossible.

Discussion and conclusions

This study resulted in a number of clear findings:

1. All stakeholders agreed that MAPs provide supplementary income and local medicines for many rural people.
2. All stakeholders except some traders, and half of the collectors, felt that the MAP resource was degraded by comparison with the past as a result of collecting. However, all were concerned about future degradation. Worries about degradation were linked by some to perceptions of the MAP resource as subject to open access. This study found no support for such linkage, as a functioning indigenous system which controls access was reported from Gorkha District. As opposed to rural collectors, most non-collectors have never visited the alpine pastures where the plants grow. (I)NGOs engaged in field activities can be expected to have a general idea of the situation, but most DFO and MFSC staff, and traders residing in the Terai, do not. These individuals probably form their opinions on the basis of hearsay, conjecture, and literature, combined with their own ideology and organizational culture—leading to inaccurate perceptions of alpine pasture tenure systems. This study illustrates that location-specific information is important, and that blanket statements about the state and management of the MAP resources are inappropriate.
3. Regardless of the perceived causes of degradation, all stakeholders except DFO staff claimed to give priority to collection over conservation if it was necessary for the livelihoods of the rural poor.
4. There was widespread agreement that collection bans do not work to protect the MAP resource. This opinion is very likely to be well-founded in reality, as all stakeholders, with the possible exception of some MFSC and (I)NGO staff without field experience, had first-hand experience with collection, control, and trade of banned products.

This study therefore indicates that new forms of management must be sought.

The findings in this study must be understood in relation to the possible hidden agendas of stakeholders. It can be argued that collectors and traders could have an interest in portraying the MAP resource as unspoiled to avoid further restrictions on collection. DFO and MFSC staff might be interested in portraying the MAP resource as degraded to justify central control, and therefore give answers that picture rural collectors as irrational and greedy, incapable of building institutions of any kind to regulate access to the MAP resource. In contrast, (I)NGO respondents may view rural collectors as rational but ignorant people who, once taught the proper harvesting techniques by (I)NGOs, are the best persons to manage the resource. This obviously would provide these organizations with a rationale for their work.

Perhaps the only way to address differing perceptions like these is through more contact between stakeholders and more field experience. Additional research into the state of resource degradation, collector knowledge, and indigenous management may also help ensure that policy is based on real field situations. In fact, one of the greatest challenges facing the creation of field-based MAP policies is that the state of the resource and its production potential are not objectively known, since there are no inventories from which meaningful generalizations can be made. Some important reasons for this are that such inventories are methodologically difficult compared to forest inventories, that they are very labor- and time-consuming, and that MAP inventories do not seem to receive the high national priority that would be needed to overcome such serious obstacles. Because the information is not likely to be available in the near future, the issue at hand is: what are the consequences of one line of action compared to another? Should the precautionary principle be applied (a conservationist approach)? Should rural livelihoods be prioritized (allowing free collection)? Or can a combination of the two be designed that will address both satisfactorily?

This study suggests that the answer to these questions is a combination that emphasizes livelihoods. Achieving this balance between conservation and collection will require active participation by collectors, possibly through involvement in formalized community management. Handing over alpine pastures entails a number of problems not discussed here, but this study shows that stakeholders are generally positively inclined

towards the idea. This option could satisfy both the collectors' wish to continue their de facto execution of control over access and the wish of authorities to endorse management.

The remote nature of MAP resources means that rural collectors must police themselves and conservation measures must fit within their management systems to succeed. Because DFO staff implement new rules on the ground, their concerns for conservation must also be addressed. Rules that specify the desired weighting between conservation and collection will be required to make sure all stakeholder needs are included and addressed in on-the-ground implementation by DFO staff.

ACKNOWLEDGMENTS

We wish to thank all the respondents for their willingness to contribute to this study. We also thank Palden Lama, our untiring research assistant and interpreter. In addition, we are grateful to the students from the Institute of Forestry, Pokhara, for testing the questionnaire; to participants in the WWF/IOF workshop on Community-based Approaches to Conservation of Medicinal and Aromatic Plants in Nepal: A National Workshop in Applied Ethnobotany, 9–12 October 2001, for valuable input to preliminary conclusions; and to 3 anonymous reviewers, as well as Carsten Smith Olsen, Nico Hjortsø, and Stig Møller Christensen at the Unit of Forestry, Royal Veterinary and Agricultural University, Copenhagen, for comments on the paper. The Council for Development Research of the Danish Ministry of Foreign Affairs and the Royal Veterinary and Agricultural University kindly provided funding.

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