

Participatory Utilization and Conservation of Medicinal and Aromatic Plants: A Case from Western Nepal Himalaya

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Abstract

Medicinal and aromatic plants in the Mountains of Nepal can contribute to the local economy and subsistence health needs while conserving the ecosystem and biodiversity of an area. This paper examines a range of conservation and development strategies in this sector for improving economic and environmental conditions for the benefit of local community members in a sustainable and equitable way. The data and information for this paper came from the studies conducted and experiences gained while working in the "Community Based Ecosystem Management Through Local Enterprise Development" project in Humla, Nepal from January 1995 to December 1997.

Starting with the theoretical base and contextual background at the initial period of the project, the utilization, harvesting and trade patterns of medicinal and aromatic plants of Humla are assessed. Over 100 species of medicinal and aromatic plants of three distinct but non-exclusive categories of use are identified along with their ecology as well as the existing utilization and management practices. Then, the integrated conservation and development strategies and their results are examined. The main strategies developed and tested are sub-sector analysis for determining enterprise options, local capacity building, and community based enterprise for additional incentives to collectors; strengthening community rights over resources; combining indigenous expertise with scientific knowledge; providing marketing and business support; promoting integrated conservation education; establishing linkages and coordination among user groups; and networking national level forums for proper policy formation and implementation support. It is emphasized that the integrated conservation and development approach that creates more direct incentives to local communities can have better conservation impact than the traditional one.

I. INTRODUCTION

Medicinal and aromatic plants (MAPs) are an important part of the Nepalese economy, with exports to India, Hong Kong, Singapore, Japan, as well as France, Germany, Switzerland, the Netherlands, the USA, and Canada. These plants have a potential for contributing to the local economy, subsistence health needs, and improved natural resource management, leading to the conservation of ecosystem and biodiversity of an area (Subedi 1997). Moreover, non-consumptive uses and functional services of the ecosystems that harbor these plants are significant to the society as a whole. MAPs were previously an understudied and neglected resource in Nepal, despite MAPs multi-million dollar export earnings potential (Edward 1996; Subedi 1997), importance to poor populations, and significance to biodiversity conservation. But these species are being overused and degraded (Edward 1996; Malla *et. al* 1995; Hertog 1995; Karki 1996; Sharma 1996). Recognizing these multiple functions of MAPs, a concept of integrated conservation and development project (ICDP) was developed to implement on a pilot scale.

After conducting a feasibility and planning exercise a project, "Community Based Ecosystem Management Through Local Enterprise Development" (Humla Project) was designed and has been implemented in Humla since 1994. The project is implemented by Asia Network for Small Scale Bioresources (ANSAB) along with its two partner NGOs, Appropriate Technology International (ATI) and Humla Conservation and Development Association (HCDA). Funding for the project is through grant administered by the Biodiversity Conservation Network (BCN). BCN is a program developed by the Biodiversity Support Program, a consortium of three

environmental NGOs: World Wildlife Fund, The Nature Conservancy, and the World Resources Institute. BCN is supported by the US Agency for International Development. The primary goal of the Humla Project is to conserve the natural resource base and unique biodiversity of Humla District while utilizing the commercially valued products of these resources in an equitable, efficient, and sustainable manner for the benefit of local community members.

The data and information for this paper came from the studies conducted and experiences gained while implementing the Humla Project during January 1995 through December 1997. Starting with the initial situation, this paper documents the biodiversity and MAPs of Humla along with their utilization, harvesting, and trade patterns. Then, the conservation and development strategies adopted by the Project are examined based on the observations and studies undertaken in the past three years. Finally, lessons are drawn that would be useful to share by others interested to support community based conservation of MAPs.

II. THE RESOURCE BASE AND INITIAL SITUATION

1. The Study Area and Its Biological Significance

Humla District is situated in the northwest corner of Nepal and is one of the most remote regions, with the nearest road in Nepal a two week journey by foot from Simikot, the District Center, to the road-head in the *Terai* (see the Map below). The project area covers eight Village Development Committees¹ (Bargaon, Chhipra, Kharpunath, Lali, Raya, Ripa, Rodikot and Thehe) of Humla with a total human population of 9,722 in 1,745 households, according to 1991 census. Approximately 86,000 hectares of the project area consists of over 29% of forest land and about the same size of grassland and scrubland combined.

Within its elevation range of 1800m to 6500m there are limited subtropical valleys in the southern margin although most of the area is ecologically temperate or highland. A cold, generally dry climate exists in the high alpine valleys just north of the southern arm of the Himalaya that cuts across the bottom of Humla. The region lies within the transition zone dividing the Western Himalaya (Holarctic biogeographic zone) from the Eastern Himalaya (Oriental biogeographic zone). This location (distance from markets, inaccessibility, and the unusual confluence of geologic, climatic and biological factors), and the area's orographic isolation, create a region of high floral diversity, with distinctive vegetation, as well as a high degree of endemism, including many valuable MAPs.

The area is not only rich in species biodiversity but also represents a broad range of habitat types. The major habitat and vegetation types inhabited from the lower elevations to the tree line in the project area are given in Table 1. The area also inhabits a number of wild fauna including the following eight protected and endangered species: Snow Leopard (*Panthera uncia*), Clouded Leopard (*Neofelis nebulosa*), Musk Deer (*Moschus moschiferous*), Wolf (*Canis lupus*), Leopard Cat (*Felis bengalensis*), Wild Yak (*Bos mutus*), as well as Impeyan Pheasant (*Lophophorus impejanus*), and Satyr Pheasant (*Tragopan satyra*).

¹The smallest politico-administrative unit in Nepal.

Table 1. Major Habitat and Vegetation Types Within the Project Area of Humla

A. TEMPERATE ZONE (2001 - 3000m)

1. Lower temperate forests

- a. Chir Pine (*Pinus roxburghii*) forest
- b. Blue Pine (*Pinus wallichiana*) forest
- c. Oak (*Quercus leucotrichophora*, *Q. floribunda*) forest
- d. Mixed broad-leaved forest (*Juglans*, *Acer*, *Populus*, *Alnus*)
- e. Riverine forest (*Aesculus indica*, *Juglans regia*, *Alnus nepalensis*)

2. Upper temperate forests

- a. *Quercus semecarpifolia* forest
- b. Mixed broad-leaved forest (*Acer* spp., *Rhododendron* spp.)
- c. Mixed Blue Pine -Oak (*Q. semecarpifolia*) forest
- d. Coniferous forest (*P. wallichiana*, *Abies spectabilis*, *A. Pindrow*, *Tsuga dumosa*, *Taxus baccata*, *Picea smithiana*, *Acer* spp. and very sparsely *Cedrus deodara*)

3. Burned areas

4. Rocky slopes

5. Grasslands

B. SUB-ALPINE ZONE (3001m - 4000m)

1. Subalpine forests

- a. *Quercus semecarpifolia* forest
- b. Fir (*Abies spectabilis*) forest
- c. Birch (*Betula utilis*) forest
- d. Rhododendron - Birch forest
- e. *Juniperus indica* steppe

2. Subalpine scrubs (*Rhododendron* and *Sorbus microphylla* shrubs)

3. Subalpine grassland

4. Burned areas

C. ALPINE and NIVAL ZONE (above 4000m)

1. Scrubland (*Rhododendron*, *Juniperus*)

2. Grassland (*Graminae*, *Cyperaceae*)

3. Rocky slopes (mat patches, scarcely vegetated rocks and screes)

4. Glacier and snow-covered land

2. Socio-Economic Pressure and Threats to Biodiversity

The project area is inhabited by mixed caste and ethnic groups of both Tibetan and Hindu communities including Bhramin, Thakuri, Chhetri, Lama, Byansi, Kami, and Sarki. Most of the people are illiterate (70%). Almost all households are farming crops and/or raising livestock as their main occupation(s). Thus, a majority of the population is predominantly agrarian and subsistence in nature. Their social, religious, and cultural practices, in one way or other, are linked with the natural resources.

Natural resources were being exploited above their sustainable capacity in order to meet the increasing needs of a rising human population. Transhumance (migratory herding system), terrace farming, collection of fodder, fuelwood and non-timber forest products (NTFPs), and slash-and-burn agriculture (locally called as *kurilla halne*) are

still in practice in Humla and many households of the District are keeping large herds of sheep, goats, cattle, mules, and horses.

Heavy use of these resources converted formerly diverse vegetation into homogenous strongholds of a few resilient species indicating the degradation and loss of biological diversity close to human settlements. Degraded areas were often taken over by resilient species such as *Urtica dioica*, *Girardinia diversifolia*, *Salvia moorcroftiana*, *Chenopodium album*, *Prinsepia utilis*, *Artemisia sieversiana*, *Rumex nepalensis*, *Berberis asiatica* and *B. aristata*. In the neighboring districts of Jumla and Mugu, native coniferous forests had largely been replaced by *Pinus wallichiana*, a frequent colonizer that follows ecological disturbances. In Humla, however, many of the side valleys still harbor stands of native coniferous forest (*Abies pindrow* and *Picea smithiana*).

With the increasing extraction of non-timber forest products (NTFPs) including MAPs for commercial purposes, the degradation trend of these resources was also increasing. The threats to these resources were linked to human activities such as uncontrolled harvesting (over harvesting, inappropriate timing and methods of harvest, etc.), over grazing, burning, shifting cultivation, poaching, and other activities that lead to deforestation and habitat loss. These human activities were the results of several socioeconomic factors such as poverty, immediate cash needs of local people, lack of alternative income generating opportunities, defective property rights, lack of incentive for conservation, limited knowledge on conservation, and increasing market demand for these products.

3. The MAPs of Humla and Their Utilization Patterns

a. A Large Number of MAPs with Different Categories of Uses

A large number of MAPs have been utilized in Nepal. Of the total number of known vascular plant species of Nepal (7,000) about 20% (1,400) are recorded as medicinal and aromatic plants (Shrestha and Tiwari, pers. communication). The project's more than 51,000 ha (forest, scrub and grassland), representing almost 60% of the total land, is the natural habitat for about 1500 species of plants including a large number of MAPs. These MAPs have a variety of uses in the project area. From the point of view of utilization and management, three distinct but mutually non-exclusive categories of MAPs were identified. These are:

- commercially traded;
- potential for trade; and
- locally used or traded for subsistence purpose.

Commercially traded species are those which are traded directly or through a series of traders to processing or manufacturing industries, or distributors. To have potential for trade a plant species must be found in a sizable volume, not be currently traded from Humla, but already be traded outside the District or Country, or have some prospect for processing at the local level. Thus, a species which is currently used only for subsistence purposes may enter into trade at any time when its outside market value is known or a commercial product is developed using its product(s).

Initially (in 1994) 70 species of MAPs were identified in the project area of which 6 were in trade commercially, 20 had potential to enter into trade, and 44 had

subsistence uses. Over the period an additional MAPs were identified for a total of 102. Ten of the potential species have since entered into the trade making 16 commercial and 31 potential for trade. Another 55, all the 16 commercial and 24 of the potential species for trade are being used for subsistence purposes. These 102 species of MAPs are listed by the utilization categories in Annex 1 along with the information on ecology, morphology, habitat and distribution, parts used, usage (current or potential commercial uses, or subsistence), and the season of collection.

Although the commercial exploitation of MAPs collected in Humla has been limited, according to key informants, several MAPs have been collected for fifty years or more. People from Jumla, especially those of the Sinja area, used to come into Humla to harvest *Kutki* (*Picrorhiza scrophulariiflora*), *Atis* (*Delphinium himalayai*), *Panchaunle* (*Dactylorhiza hatagirea*), *Guchche-chyau* (*Morchella conica*), and *Silajit* (organic exudate from rock). Traders also used to come from Sama Bargaon (Jajarkot district) to barter tools, grains and clothes for herbs like *Picrorhiza scrophulariiflora* and *Delphinium himalayai*. But the markets for most wild harvested plants from Humla have developed more recently. *Bhutkesh* (*Selinum tenuifolium*), *Lekh-Satuwa* (*Trillidium govanianum*), *Bhojpatra* (*Betula utilis*) and *Sugandhwal* (*Valeriana jatamansi*) have been harvested for just a few years and India's current demand for *Jatamansi* (*Nardostachys grandiflora*) dates back to less than two decades. The high value, low volume MAP species that were legally collected for established markets are: *Delphinium himalayai*, *Picrorhiza scrophulariiflora*, *Nardostachys grandiflora*, *Valeriana jatamansi*, and *Satuwa* (*Daiswa polyphylla* var. *intermedia*).

In addition to the trade for cash income, a large number of MAPs were used locally in the traditional health care system in Humla. Some commercially traded MAPs were also used for local medicine and incense making. The most notable products are *Kakarsingi* (insect gall on *Pistacia integerima*), and roots of *Picrorhiza scrophulariiflora* and *Nardostachys grandiflora*. These locally used MAPs were also found to be bartered for grains in Humla and its neighboring districts.

b. Traditional Practices of Harvesting and Trade

The communities of Humla have been harvesting a large number of MAPs from the government owned national forest and grasslands. Since these forest and grasslands were considered to be under the government property regime and not under the control of the communities, there was an incentive to harvest as much as possible before someone else got to it. At the same time, there was little or no awareness for conservation coupled with no alternative income generating opportunities that would change the unsustainable practices. Although there was little pressure on species that were collected for local use on a subsistence basis, the pressure on some of the commercial species has already resulted in overharvesting, and in some cases, immature and unscientific harvesting leading to the threat of extinction. The indigenous knowledge and traditional skill of limited individuals on harvesting MAPs at a subsistence use level were not enough or enforceable to apply to the harvesting of commercially demanded species. The same was true on production management, post harvest operations, processing, and marketing.

The market system, policy, legislation, and practices were not providing sufficient incentives to local collectors for improving their living standard and the conservation of the resource base. The existing legislation and their implementation system such as bans, collection permits, royalty payments, transport permits, and lack of knowledge

of laws, all contributed to the increased possibility of rent-seeking results of which are negative to collectors.

The traditional market and trade channels of most of the MAPs followed a general pattern of forest/meadow to village to roadhead or trade center, then on to larger trade centers or India. The MAPs harvested in remote areas of Humla were sold through a long marketing channel, which was inefficient and costly from the perspective of the collectors. In the existing trade channel, local collectors used to harvest the raw materials from national forest lands, carry them back to their houses where they were dried and then sold to a trader either at the village or the district airport. Traders regularly used to travel through the collecting areas of Humla before the harvesting season, placing orders with collectors for set volumes at an agreed upon price and usually provided an advance on the final payment. These traders then used to come back after collection was completed to finalize the purchase. Occasionally they would pay only a fraction of the agreed upon price and the collectors were forced to sell at a lower rate than they expected, as there were only a limited number of traders. Some collectors tried to market their products directly in Terai wholesale markets, but this became costly and risky. The market was operating for a number of decades but was imperfect, as there were only a limited number of wholesalers who controlled the price information (Subedi 1997).

c. Processing Capabilities and Local Enterprises

A survey made by ANSAB shows that the number of local processing and manufacturing industries is few, with the bulk of NTFPs still leaving Nepal in raw form (Subedi, 1997). Based on an average of 13 products traded from catchments in far-west, central and east Nepal, Edward (1995) found that harvesters of NTFPs receive only 32% of the final price in India.

Although the technology behind processing of many MAPs is relatively straightforward and a wide range of Ayurvedic preparations are already produced, the processing industry is in its infant stage in Nepal. The main difficulties are getting reliable information, processing technologies and access to market (Subedi, 1997).

There were neither enterprises for value-addition to MAPs raw materials nor many cottage industries in Humla. Some weaving of Allo (*Girardiana diversifolia*) and Hemp (*Cannabis sativa*) cloth and other fiber was going on but the work was difficult with the market being very limited. The weaving of nigalo for baskets, mats and other goods for daily, seasonal, and ceremonial uses was common in the lower parts of the district. Other small household level cottage industries practiced in Humla included dye making, honey production from bees, and *Bhutun* production (a sour juice concentrate locally made from the plant, *Pyrus pashia*). But no reliable market had been found for selling these products except at the local level. The MAP products from the project area were traded in raw form without any value addition, then exported (or smuggled out) to India for sale to traders and processors. The collectors of MAPs were not marketing their products, rather, they were selling the products to buyers. The collectors and local traders of the project area were only suppliers of raw materials for processors in other countries, forcing collectors to extract growing amounts of material to increase their revenue while returning little of the final value of the product to the local economy.

III. THE CONSERVATION AND DEVELOPMENT STRATEGIES AND THEIR RESULTS

1. The Approach

The Humla Project has adopted an integrated conservation and development project (ICDP) approach. The key feature of this approach is that it does not attempt to divide biodiversity-rich landscapes into areas formally reserved for biodiversity conservation versus areas for human populations. Rather, the program treats the landscape as an integrated whole, attempting to develop direct links between the biodiversity and the surrounding human populations. This approach is being implemented in Humla to test a hypothesis that if local communities are given control of their resources and the technical assistance to develop and manage them in an environmentally responsible way, then they will act to manage the resources in a sustainable manner. In other words, it is expected that the additional benefits from the biodiversity resources will provide an incentive to local communities to identify and take action against both internal and external threats to biodiversity.

A methodology was devised for the promotion of MAP commercialization as a strategy for biodiversity conservation and economic development. After a feasibility study and an analysis of the value-chain for essential oils, a local enterprise was established to process various plant products into essential oils. The project site was selected based on three criteria: feasible to demonstrate a direct link between the survival of the community enterprise and *in situ* management of the biodiversity upon which the enterprise depends; possible to create an enterprise that would generate economic, social and/or environmental benefits immediately for community stakeholders and that would have a high probability of remaining a sustainable source of revenue even after the end of the project funding; and chance of involving local communities in the enterprise substantially. The major activities undertaken in this endeavor include enterprise development, marketing, local capacity building, proper allocation of property rights, institutionalization of resource management systems, and monitoring and evaluation.

2. Initial Planning and Sub-Sector Analysis

The project activities started with the participatory planning with all major stakeholders including collectors, women's groups, local leaders, traders, and outside experts. The planning study collected and analyzed information on resource base, social, economic and institutional conditions, and collection, trade and marketing of non-timber forest products. The study also used the techniques borrowed from subsector analysis to explore potential enterprise options. Subsector analysis looks at all the functions, players, and potential hard and soft technologies associated with a given product, which are arrayed in relationship to market conditions. Opportunities and constraints were identified and the most promising enterprise option, distillation of medicinal and aromatic plants, was generated.

3. Local Capacity Building

Humla Conservation and Development Association (HCDA), a local community based organization (CBO) representing all stakeholders, was created during the planning exercise and was supported to build a sustainable institution that would

continue the project initiated activities after the project ends. HCDA staff capacity was strengthened through regular hands-on exercises during the course of the project implementation and action oriented training.

4. Community Based Enterprise for Additional Incentives to Collectors

Initial market system and value-chain analysis of non-timber forest products (NTFPs) identified a processing enterprise to produce essential oils by distilling a variety of MAPs. Humla Oil Pvt. Ltd. (HOPL) was established in 1994 and has been owned and operated by the local communities with technical and financial assistance from INGOs and NGOs. In 1996, the company expanded its processing ability by establishing the second distillation unit with a capacity to process up to 60 tons of herbs (rhizomes and roots of *Nardostachys grandiflora* and *Valeriana jatamansi*, leaves of *Rhododendron anthopogon*, berries of *Juniperus indica*, etc.) a year, using a simple water-cum-steam distillation technique.

In 1997, the CFUGs of Humla, HCDA, and HOPL staff decided to take over the full ownership of the company, manage it, and share the profit by themselves. This is not only seen as a successful handover of the project initiated activities to locals, but also as an indication of local capacity building to handle other new enterprises such as local co-operatives for improved marketing of NTFPs.

As a result of this enterprise, the collectors are getting competitive prices for the raw NTFPs and with the community forestry strategy (see below) communities are getting additional money from royalty payments. Previously, royalties went to the central government. Royalties received by communities have created incentives for collectors to organize into well defined user groups that harvest and manage their resources in a sustainable way. By taking collectors from being just suppliers of a raw material and helping them move to processors of raw materials, the collectors are now dependent on a long-term supply of the raw material to keep their factories operating.

5. Proper Allocation of Property Rights through Community Forestry

To address the problem of open access property rights situation in Humla, the project adopted a community forestry strategy utilizing the existing legislation of Nepal. The establishment of a Community Forest (CF) is a complex process involving the handing over of use rights and management responsibilities to the local people who are formed into community forest user groups (CFUGs), which are comprised of people who have traditionally used the forest and are prepared to take on its management. The Forest Act of 1993 and Forest Regulations of 1995 establish CFUGs as independent organizations with their own constitution. The CFUGs are required by law to operate under their constitutions and file operational plans with local District Forest Officers. Management prescriptions are worked out and written into the operational plan, which is submitted to the DFO for approval. After approval, the forest is handed over to the CFUG. These operational plans function as resource management and conservation plans for the designated CFs as well as contractual agreement between the Department of Forest and the CFUGs.

In Humla this approach took the form of support for HCDA and the communities they began working with in 1994. At that time no community forest existed in Humla District. Initial work was started with the formation of collector societies, informal village based groupings of people that already collected raw material for sale into

India unprocessed. The project used this as a launching point to introduce and implement formal community forest user groups and establish a company to add value to local natural resources. This was seen as a way to introduce sustainable conservation practices that were driven by the communities themselves.

Prior to implementing the CFUG strategy, communities were reluctant to go after legal recognition. It was easier to let the status quo prevail. But, in Humla, the Project wanted to test the CFUG process, as a methodology for accelerating community conservation by providing direct economic incentives. The economic incentive was the direct royalty payments for NTFPs promised to the CFUGs, which previously, as mandated by HMG, were paid only to the District Forest Offices across Nepal.

Communities, rightly so, were skeptical that the royalties would really materialize and that the hassles of completing the management plans and enforcing them would be worth the benefits they were promised through the CFUG mechanism. The first communities to participate had members trained in conflict resolution. This allowed the communities to have a tool to negotiate difficult boundary issues that had to be resolved before CFUG management plans could be put in place. Next, communities participated in developing their own conservation plans; technical assistance and biological monitoring training were provided by ANSAB. All this work was done in close cooperation with the District Forestry Officials who eventually had to sign off on the operational plan. Even after the first CFUGs were signed, neighboring communities were skeptical. It was not until royalties started to accrue to the CFUGs that other communities trusted that the process could bring them additional economic benefits while providing them with a mechanism to conserve their resources. This had never been done in Nepal, but it allowed communities across the country to collect a new source of revenue directly tied to taking part in the community forestry process.

As a result of this strategy, 24 CFUGs covering 13,829 hectares of forest and 2,153 households have organized, of which 9 CFUGs have had forest and pasture land handed over to them from the government, 9 are in the process of being handed over, and 6 are planned to be handed over in 1998. The CFUGs have been designing and implementing legally binding management plans that include a strong conservation component while benefiting both financially and socially through the continued existence of their natural resources.

6. Combining Indigenous Knowledge with External Expertise

With its participatory approach, the Project worked with local people for planning and implementing activities recognizing the indigenous knowledge, skills and practices. External expertise was provided only to complement the existing local knowledge and practices. All MAPs found in the project area are listed combining the knowledge of local with outside researcher (see Annex 1). However, in many cases, the existing practices and indigenous system of management were insufficient or even inappropriate to adopt in changing context for the management of commercial species. To assist existing and potential CFUGs in moving towards sustainable management of their community forests, general guidelines as well as specific profiles for each of the commercially most important species is prepared on the basis of both indigenous and scientific information available. The individual species profile covers biology (taxonomy, habitat and range, ecology, regeneration), resource management,

utilization, marketing, and socioeconomic and policy issues. A sample of the profiles is attached as Annex 2.

7. Marketing and Business Support Services

Another way to generate incentives for conservation is to obtain higher prices for the product and provide more equitable benefits to local community groups. This requires knowledge of markets and the means to reach them. Although there is an increasing demand for plant-based natural products in domestic as well as international markets, getting access to the market by small producers is quite often very difficult. Direct support to local people with the marketing information (current marketing channels, amount of each product, price variation, as well as future supply and demand of the products, processed product, product development and future price projections) was very helpful in this regard. The impact from the higher prices offered by HOPL for the raw material, based on the information from the initial market survey and business planning, was not only limited to the project area but throughout the country. Previously, the limited traders used to enjoy a huge margin by controlling the price information of the Indian market.

It is generally felt that local people in remote area as cheated by contractors or by other brokers. But we found that the role and services of brokers and middlemen (cash advances, transport, storage, risk-taking, etc.) are very important. Before moving on to replacing or improving the market channel, it is important not to forget middleman functions and services. Access to start-up and working capital as well as effective cash flow management is always important for the success of such a community managed enterprise. ATI and ANSAB arranged for much needed capital by establishing a revolving equity fund administered by the HCDA. The main objectives of the revolving equity fund are to assist the people of Humla (individually or in groups) and to establish businesses based on the collection and processing of NTFPs and other natural resources.

In addition, ANSAB and ATI are providing support in developing several marketing strategies. Notable among them are:

- 1) target markets that demand environmental, social equity, and high quality standards for the products;
- 2) search several possibilities for diversifying markets;
- 3) collaborate with other agencies for new product development;
- 4) identify and make agreements with distributors; and
- 5) coordinate with other producers to increase collective bargaining power.

8. Integrated Conservation Education

Starting with the basic literacy classes, a special conservation teaching module was designed and is being implemented to raise greater conservation awareness. These modules are being used to educate the members of CFUGs and provide them with basic guidelines for the sustainable management of their forest and pasture resources.

Conservation education together with direct facilitation by ANSAB forest rangers in community forestry activities is starting to show some preliminary outcomes. Several villages stopped burning the upper pastures in order to conserve NTFPs; rotational

harvesting has been adopted by most of the CFUGs; and villagers are interested in enrichment planting. To easily enforce the harvesting levels, CFUGs have also instituted a practice of collecting NTFPs in groups.

9. Creating Linkage and Coordination among User Groups

An assembly of all the registered CFUGs of Humla formed a district wide federation of CFUGs in November 1997. The purpose of the formation of the federation is: to strengthen the decentralized decision making power of CFUGs and increase the interaction among CFUGs of the district as well as outside Humla for exchanging ideas, experiences, and lessons learned; to increase the access to financial and technical resources to CFUGs through collaboration with other agencies; to promote conservation and explore income generating opportunities; to facilitate conflict resolution that may arise within and between CFUGs; and protect the rights of CFUGs by participating in the policy making process at local and national levels.

10. National Level Forum for Proper Policy Formation and Implementation

The coordination committee of the Nepal NTFP Network, which is represented by the Ministry of Forests and Soil Conservation, all its Departments, Community Forestry Division, research and training organizations, private companies and ANSAB, has been playing a key role in elevating the importance of NTFPs in community resource management and facilitating the formation and implementation of the policies that are conducive for the benefit of local people as well as for conservation. It is found that the ground breaking initiatives of including NTFPs in community forest management, and the hand over of rights and responsibilities of these government owned lands to CFUGs were greatly accelerated through the Network.

VI. CONCLUSIONS AND LESSONS LEARNED

Based on the findings discussed in this paper some conclusions are drawn, from which a number of lessons useful for the participatory conservation of MAPs can be learned.

1. Although Humla is rich in biodiversity and MAPs, the increasing national and international demands for them coupled with rural poverty, lack of income generating opportunities, demographic pressure, illiteracy, and traditional systems of harvesting and trade have resulted in the degradation of the resource base of these plants.
2. The impact of new commercial demand for medicinal and aromatic plant products, within the existing structure and functioning of the Nepalese social system, is negative to both the local communities as well as the natural ecosystem and biodiversity. Under such conditions, the traditional system of resource control and management is incapable of sustaining the natural ecosystem and biodiversity and the existing market system does not provide local people with the substantial benefits to improve their living standard.
3. The biodiversity and MAPs of an area, which are neither abundant or completely degraded, can be utilized more sustainably by promoting an integrated conservation and development approach which create more direct incentives to

local communities rather than imposing the government regulations that can never be enforced effectively.

4. Although MAPs are found and can be managed in all types of national (leasehold, religious, community, buffer zone, and government managed and protected forest) and private forests, there is a great scope for community forests in NTFP production.
5. As a motivational tool for helping communities realize the benefits of conservation, no other extension education could compare with the direct economic benefits from conservation activities, such as royalties from forest products.
6. Establishing a community enterprise that depends on biodiversity can be a strategy to provide more equitable returns to community groups and hence incentives for conserving the resource base.
7. As community groups move from being only a supplier of raw materials to processors of those raw materials, they become aware of, and promote the conservation of those resources to assure a sustainable supply for their commercial operation.
8. While much can be gained by improving the policy, legislation, and practices to increase the incentives to local people for conservation, external support to apply existing legislation for their benefits is necessary.
9. The participatory process of development can be more fruitful only when enough external support is provided to empower the local people to be able to get access to technology, information, and required resources. Just letting local people work in development is not enough without proper external support. Proper participation of outsiders is also equally necessary in the participatory development process.

VII. REFERENCES

- Biodiversity Conservation Network (BCN). 1997. *Annual Report 1996*. World Wildlife Fund, Washington, DC.
- District Forest Office, Gorkha and German Development Service, 1995. *Medicinal and Aromatic Plants: How to Promote their Utilization and Marketing*. Proceeding of the Seminar on MAPs in Gorkha District.
- Edwards, D.M. 1995. *The trade in non-timber forest products from Nepal: Institutions for local-level development*. Draft version 5. 18+2pp.
- Edwards, D.M., 1996. *Non-timber Forest Products from Nepal: Aspect of the Trade in Medicinal and Aromatic Plants*. FORESC Monograph 1/96, Forest Research and Survey Center, Ministry of Forests and Soil Conservation, Kathmandu.
- Hertog, W.D. 1995. *Trees and people in balance: Forest utilization in Salyan District*. SNV-Nepal.
- Karki, S. 1996. *Investigating non -timber forest products (NTFPs) opportunities in Nepal*. Nepal Australia Community Forestry Project. 16p.
- Malla, S.B., Shakya, P.R., Rajbhandari, K.R., Bhattarai, N.K. and Subedi, M.N. 1995. *Minor forest products (NTFPs) of Nepal: General status and trade*. FRIS Project Paper No. 4. HMG/FINNIDA. 27p+.

Sharma P. 1996. *Non-wood forest products and integrated mountain development : Observations from Nepal*. Business Seminar on Medicinal Herbs , Essential Oils and Other Non Timber Forest Products, held in Kathmandu, December 1996. DEG/NGCCI. 11pp.

Shrestha, K.K. and Tiwari, N. 1998. Personal Communication.

Subedi, B. 1997. *Utilization of Non - Timber Forest Products: Issues and strategies for environmental conservation and economic development*. Workshop theme paper presented in the Workshop on "The Utilization of NTFPs for Environmental Conservation and Economic Development in Nepal" organized by ANSAB on March 29, 1997 in Kathmandu.

