

# **Utilization of Non-Timber Forest Products:**

## **Issues and Strategies for Environmental Conservation & Economic Development**

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**Workshop Theme Paper for  
the Workshop on the Utilization of NTFPs for Environmental Conservation and  
Economic Development in Nepal**

**March 29, 1997**

**Asia Network for Small Scale Scale Agricultural Bioresources  
Kathmandu, Nepal**

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# Utilization of Non-Timber Forest Products: Issues and Strategies for Environmental Conservation & Economic Development

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## 1. INTRODUCTION

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Development of local economy while conserving the environmental resources has become an integral part of sustainable development policy. Non-timber forest products (NTFPs) are one category of resources that have a potential for contributing to the local economy and improved natural resource management, leading to conservation of the ecosystem and biodiversity of an area.

This paper examines a range of issues and strategies in the NTFP sector for improving economic and environmental conditions for the benefit of local community members in a sustainable and equitable way. The first and foremost factor is the conservation of the resource base, ecosystem and biodiversity, from which NTFPs are harvested. This is dependent upon the sustainable harvesting and management. This, in turn, requires sufficient incentives to collectors for conservation by countering the threats. The paper starts with the current role and status of NTFPs in Nepal. Then important issues are pointed out and strategies are presented for discussion. The main issues include the improved production management, institutionalization of management system, development of enterprises for value-addition locally, and improved marketing and trade.

## 2. ROLE AND CURRENT STATUS OF NTFPs

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NTFPs are also known as minor forest products and non-wood forest products. There is no uniformity in the use of term. Some define it very broadly, to include all forest products except timber, while many others have been using the term narrowly to focus on certain groups of forest products. For the purpose of this paper, NTFPs include all goods of biological origin other than timber, fuelwood and fodder as well as services derived from forest, grassland or any land under similar uses. Examples of NTFPs include bamboo and rattan, medicinal and aromatic plants (MAPs), nuts, fruits, tubers and berries, grasses and leaves, resins, insect and insect providers, and wild animals and birds. This paper concentrates primarily on plant species.

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The local use and trade of NTFPs in and from Nepal has been a little recognized but necessary component of the subsistence lifestyles of many Nepalese people. About 100 plant species are already in trade and some 800 additional species find subsistence uses in Nepal. These goods provide needed medicines, foods, oils, fibers, dyes, tannins, gums, resins, incenses, building materials, etc. as well as financial income to many, usually poor individuals and families. The country's wide range of climates and varied topography have resulted in many different forest and grassland communities. These contain many species of valuable plants, some in large amounts. The people of the many different ethnic groups living in Nepal have made and still do make, in many similar and different ways, use of these plants.

ANSAB made a survey of producers, traders and processors of NTFPs operating in roadheads and town centers along the Tarai from the eastern border to the mid western town of Nepalgunj, Nepal during September to December, 1996. We learned that approximately 42 thousand tons, consisting of more than 100 different NTFP items were handled by about 100 entrepreneurs in 1995. This amounted to more than 1.5 billion Nepali Rupees (\$26,785,700) in 1995. Even this conservative estimate shows that commerce involving NTFPs is contributing significantly to the Nepali economy.

The problem is that in many areas it is known, and in most other areas suspected, that the diversity, quality, and availability of many species of NTFPs are decreasing. This situation has serious consequences for both the people who need these plants and the biodiversity of the many forest and grassland ecosystems.

From the experiences gained while working and interacting with collectors, producers, traders, processors, manufacturers as well as with policy makers, implementators, promoters and researchers of NTFPs in Nepal, we learned that there are several major issues on the development of NTFPs that must be considered for improving the economy and environment for the benefit of local communities. These issues are addressed in the coming pages.

### **3. ISSUES AND STRATEGIES**

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Of the important issues on NTFPs that have been identified, four crucial issues related to the community based enterprise approach are considered here for discussion. These issues are closely interlinked with one another and a careful consideration and handling of all these issues is a requisite for a successful NTFP based enterprise that is sustainable environmentally, economically and socially. Specifically these issues are:

#### **3.1 Production and Harvesting Management**

The current practice of NTFP utilization involves only harvesting during certain period that is convenient to the collectors. The management options for increasing production while making it sustainable, are not found in practice in most of the areas.

Therefore, there is a need to consider several possible options for production management depending upon the property rights, institutional arrangements and commercial opportunities. The key for the sustainable benefit is the reconciliation of biological sustainability with commercial viability. There are several possibilities to increase the NTFP production in a sustainable way: improving production from the wild, through domestication and improving harvesting technologies.

### **3.1.1 Improving Production from the Wild on a Sustainable Basis**

This involves the management of natural regeneration of NTFP species. To manage NTFPs in national forests and community forest natural regeneration management option would be the first consideration. It is appropriate where there is enough resource base in wild ecosystem, limited knowledge and skills for propagation and cultivation techniques, and difficult to get viable seeds. In Nepal, there is still a vast scope for the natural regeneration management, especially for NTFPs of high mountain areas. Again depending upon the size of human population, demand of NTFPs and their abundance a range of options can be considered such as no management, controlled harvesting, and intensive management (see Box 1).

#### **(Begin Box) Box 1. Management Options for Improving Production from the Wild**

##### **1. No Management**

Just utilization of NTFPs without any control and management was sustainable when NTFPs were used occasionally for domestic purpose by a limited population and demand for trade was very low. This option does not deteriorate the resource base in the condition where the extraction of resources does not exceed the production capacity of the resource base. But management system needs to be applied to increase the production of NTFPs.

##### **2. Controlled Harvesting**

Collection of harvestable NTFPs while retaining enough individuals for natural regeneration is a suitable strategy to initiate for an improved production system that is sustainable. The controlled harvesting technique, is a simple, easy and inexpensive management system to implement by community forest user groups (CFUGs) for natural regeneration of NTFPs in forest or pasture land. This option ensures the natural regeneration in the controlled area and checks the over exploitation of NTFPs.

Controlled harvesting can be enforced by applying one or more of the following options: rotational harvesting, fixed quantity of NTFPs harvesting, and selective harvesting.

##### **Rotational harvesting**

This is the most common and popular option that has been adopted by CFUGs who are managing NTFPs. A good example is found in Humla, where CFUGs have been managing *Nardostachys grandiflora*, *Picrorhiza scrophulariiflora*, and several other commercial NTFP species through rotational harvesting. This system can be based on indigenous knowledge of collectors even if the appropriate rotational period is not known scientifically.

Specific care is required to manage different NTFP species of different rotational cycle either by getting an average rotation period or by treating them separately.

##### **Fixed quantity of NTFPs harvesting**

This method can be applied for managing NTFPs in national forests or extractive reserves. In this, certain forest area is allocated for certain quantity of NTFPs yield. For this technique, quantity of yield from an ecosystem has to be assessed for every species of NTFPs so that a permit can be issued for a fixed quantity that does not

exceed the annual recruitment rate of the species. A potential limitation of this method is that a certain part of the forest may be heavily exploited especially those that are near and easily accessible to collectors.

#### Selective harvesting

This measure is applicable for the NTFPs that have specific harvesting requirements. Some NTFP species have a certain time or condition which is better for harvesting. For instance, pine trees of certain range of diameter are selected for resin tapping. Mature products which are going to waste could be used by selecting for harvesting. This measure is beneficial when the same species have different properties or different products.

### **3. Intensive Management**

Except some initiative from the government's departments as a research activity (Edward 1996a) there is no application of intensive management to date. In this option, the focus is not only on harvesting but also on other stages of production. For example, natural propagation of NTFPs can be maintained by cleaning the site, providing light, space, etc. Other management applications such as thinning, coppicing, etc. as needed can be maintained to ensure the high yields. It is useful for high quality and high production but is costly, tedious, and impracticable in large areas of natural forest land. It is also difficult to apply for all species due to the lack of knowledge about appropriate management techniques. At the initial stage, village collectors and users, not being exposed to the techniques could have difficulty implementing this option. But there is scope to gradually apply these techniques to the management of high value NTFPs.

#### **End Box**

#### **3.1.2 Domestication**

In Nepal, NTFP producing species are almost non-domesticated. The domestication of promising, under-exploited species in private farm land, community forest land and leasehold forest land can contribute a lot in this sector. The existing forest law also gives permission for the production of NTFPs on community forest land provided the practice does not deteriorate the condition of forest. It is more appropriate in marginal land where cultivation of crops could not fetch the cost of production and in degraded community forest land.

Some NTFPs that are now only gathered have to be domesticated if they are to survive in appreciable quantities. There seems to be a general trend that when a NTFP become commercial it is converted to a farm crop. For example, oil palm (*Elaeis guineensis*) and rubber (*Hevea brasiliensis*) are strongly supported by commercial plantation after they become industrial crops.

In Nepal, some efforts have been made by individuals and groups to domesticate some exotic as well as indigenous NTFP species. But there are several stages of scientific efforts, as discussed by Leaky and Newton (1994) which needs to be addressed during the domestication process. Some important stages among them are characterization, germplasm exploration, vegetative propagation, genetic selection, and incorporation into a sustainable land-use system.

Agroforestry offers a flexible technology system, often indigenous, by which NTFPs can be domesticated gradually, in a way that is adapted to local conditions and practices.

For important plant species, strategies for more intensive and systematic domestication might include (FAO 1995):

- screening of candidate species through species trials on farmland in collaboration with farm households;
- identification of preferred characteristics of chosen species;
- seed collection and distribution;
- study of interactions between genotype and environment; and
- establishment of seed orchard.

### **3.1.3 Improving Harvesting Technologies & Reducing Post Harvest Losses**

While the improved production measures can bring some increase in supply in a sustainable way, an increased gain is possible by improving harvesting technologies and reducing losses in harvesting, storage and transport operations.

There is mismatch in the biological maturity and present harvesting period for several NTFPs. For example, *Swertia chirayita* propagates only from seed which get matured and is shed during October-November but because of high competition and cash need during Dashain collectors usually harvest this plant during July -August, before its biological maturity.

A number of social and technical management tools and technologies can be applied. A good plan for harvest regarding quantity, timing and methods is important for biological as well as economic sustainability. There is a gap in knowledge regarding the biology and technical options for species as well as methods of harvest. Use of indigenous knowledge and further research can be very useful to improve efficiency in harvesting technologies.

Furthermore, there is a significant loss during post harvest operations. Again research studies can provide information about the storage conditions (temperature, airflow, moisture, etc.) and ways of handling during transportation to reduce spoilage.

## **3.2 Property Rights & Institutionalization of Management System**

### **3.2.1 Proper Allocation of Property Rights**

Most of the NTFPs of Nepal come from the collection in wild. Sometimes they are over-harvested because of an uncontrolled system of harvesting from the government owned and controlled forests. These areas often have limited enforcement mechanism to control over harvesting. There are discrepancies between the formal stated rules and observed behaviors regarding the rights, responsibilities and sanctions pertinent to NTFPs.

It is not to say which property rights arrangement is better over another but there needs to be clearly defined property rights. Property rights system where NTFPs are controlled and utilized is very complex with a layer of overlapping rights, responsibilities and sanctions. This can be done by properly and clearly distributing the rights,

responsibilities and sanctions over the resources. As a matter of fact, NTFPs can be properly managed in any of the following three types of property right arrangements:

- extractive reserves/national forests;
- community forests/pasture land; and
- private land.

Many types of NTFPs are found within national forests and protected areas. For many people these protected areas contain resources once used for subsistence and trade. The government has tried to control harvesting through permits and prohibitions, but these have not been effective solutions to conserve the resources. For several reasons the collection of many species of plants is going on irrespective of the government regulations. Because of the impractical and sometimes unclear property rights at present, there is little incentive to collectors for conservation.

Therefore, there is a need to reassess the rules laid down by His Majesty's Government (HMG) and other organizations, like the Annapurna Conservation Area Project, in national parks, wildlife sanctuaries, hunting preserves and other protected areas with respect to local use rights. Providing regulated access may do more to protect the resources than what is currently taking place.

Several studies report that certain NTFP species or groups of species are being overused and degraded (Edward 1994, 1996a, 1996b; Malla *et. al* 1995; Hertog 1995; Karki 1996; Sharma 1996). The reasons for this overuse and degradation are complex but include the lack of local control over these resources, rural poverty, and social and cultural traditions. Many forest users expressed a desire to gain formal control of their resources and initiate activities to gain financially from harvesting and processing the NTFPs (Maharjan 1994; Hertog 1995; Edward and Maharjan 1994; Edward 1996a; Karki 1996). Therefore, it is important to help forest users gain or retain, in a formalized manner, control of the forests and pasture lands they use. A strong case can be made for supporting Forest User Groups (FUG) as they work to organize and develop operational plans for their forests and pasture lands, so that these resources can be handed over to the FUG by HMG.

Efforts have been made to cultivate some NTFPs on private land, where land tenure is not a problem, but these efforts also face technical constraints.

### **3.2.2 Conservation Education and Training Activities**

Part of the reason NTFP resources are degraded is due to a lack of awareness on the part of forest users as to the consequences of their actions. Moreover, most extension workers and forest users are unaware of the options for conserving while managing NTFP economic activities for the benefit of local people. Providing conservation education in conjunction with technical assistance may be a way to reach forest users in order to help them see their resource situation from a different perspective. Similarly, there is a need to provide training and conduct educational activities on NTFP for extension workers and forest users.



### **3.3 Local Value Addition**

The collected or produced NTFPs from forest or cultivated land can be sold in different forms -- crude raw materials, improved raw materials or processed raw materials -- through different market channels.

There is an increasing demand for plant-based natural products in domestic as well as international markets. Proposals for NTFP commercialization that include local interests have been initiated, but on-the-ground progress is not satisfactory. 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. Based on an average for 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.

The value of Nepal's NTFPs is large, but the potential of value-adding opportunities is unrealized. Community control of NTFPs and more equitable returns to the collectors who are the only ones who have a direct impact on resource conservation is also underdeveloped. The improved raw material generally fetch higher price than crude raw material and processed raw material fetch more than the improved raw material. An improved market channel could bring out more value than a primitive one. Value addition intends to make the same products more valuable. So it plays a greater role in the local economy. First, the products will be transformed and can fetch a better price than crude. Secondly, it creates employment for local people and help to uplift their living standard. The employment so generated through value addition can add to the income generation opportunities for local people.

Realizing this fact the government has made the rules for exports of NTFPs; some selected NTFPs can only be exported after processing. These laws restrict the export of crude NTFPs from Nepal to other nation as an attempt to ensure income generation nationally.

Value addition can be made in a number of ways by increasing the efficiency in each stage of the value-chain. Improvement to raw materials and processing are two common examples of value addition that can be done by local communities.

#### **3.3.1 Improvement to Raw Materials**

With the present trade scenario with Indian buyers, collectors perceive a little incentive for them to improve raw materials where traders do not distinguish the quality of materials and pay by weight, regardless of quality. But there are markets that do have quality requirements. The traders has started to offer different prices for different grade of materials. The maintenance of quality is also important from a point of view of sustainable trade with some partners.

Simple operation such as cleaning and assured grading can add a significant value by reducing transportation costs and establishing quality standards in trade. In cleaning, waste material is separated from raw material but in grading, the product is divided into grades based on quality as determined by the buyers in the market.

#### **3.3.2 Processing**

Although the technology behind processing of many NTFPs 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.

Local processing is an important step to redirect the returns from NTFPs to the people of product origin. The processed raw material is reduced in size and quantity and hence it reduces the cost of transportation. At the same time it makes the product many times valuable. The same quantity of products after processing can fetch more value than sold in crude.

Establishing an enterprise for processing NTFPs that links with the biodiversity conservation can be a strategy to provide more equitable returns to community groups and hence incentives for conserving the resource base (see Box 2). As community groups move from being only a supplier of raw materials to processors of those raw materials, they become aware, and promote the conservation of those resources to assure a sustainable supply for their commercial operation.

### **Box 2. Community Based Processing Enterprise in Humla, Nepal**

Humla Oil Pvt. Ltd. (HOPL) was established in 1994 to process non-timber forest products in Humla in order to capture additional value for the communities that use and maintain the natural resources. HOPL is community owned and operated with technical and financial assistance provided by the Biodiversity Conservation Network (BCN), Asia Network for Small Scale Agricultural Bioresources (ANSAB) and Appropriate Technology International (ATI) through the Humla based NGO, Humla Conservation and Development Association (HCDA). HOPL is processing selected NTFPs into essential oils using simple distillation (water-cum-steam). This year, the company expanded its processing ability by establishing a second distillation unit with a capacity to process up to 60 tons of herbs (rhizomes and roots of *Nardostachys grandiflora*, *Valeriana jatamansi*, leaves of *Rhododendron anthopogon*, Juniper berries, etc.).

In addition to processing, HOPL also:

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

All attempts are made to assure that operation of Humla Oil Pvt. Ltd. is sustainable from a biological stand point. The company was established within the context of biological, socio-economic, and enterprise goals set out in the Biodiversity Conservation Network (BCN) program. Sustainable harvesting practices have been put in place through the institutionalization of community resource management systems in most of the areas from which NTFPs are collected. The collectors are getting competitive prices for the raw NTFPs and communities are getting additional money from royalty payments once they finalize their Community Forestry User Group (CFUG) management plans. Previously, royalties went to the central government. Royalties received by community have created incentives for collectors to organize into well defined user groups that harvest and manage their resources in a sustainable way.

Another strategy adapted by the company for promoting sustainable harvesting is through targeting markets that demand environmental, social equity, and high quality

standards for products. With assistance from ATI and ANSAB the company is exploring sales deals with several Indian and European buyers that put a premium on eco-friendly products. HOPL has also established a distribution arrangement with an American company, who will act as the exclusive U.S. distributor of HOPL's essential oil product line, providing valuable market access for HOPL and quickly responding to sales orders from U.S. buyers. These targeted essential oil buyers promote environmental sustainability and equitable distribution of business benefits within communities.

Another issue affecting sustainable operations of local community managed enterprise is access to working capital and effective cash flow management. For such an enterprise, there is always a problem of cash flow as it needs a significant sum of working capital to purchasing raw materials. 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) to establish businesses based on the collection and processing of NTFPs and other natural resources. **End**

### **3.4 Market, Marketing and Trade**

Another issues to generate incentives for conservation by providing more equitable benefits to local community groups is to obtain higher prices for the product. This requires knowledge of markets and the means to reach them. In Nepal, NTFPs are sold in local, urban, national, regional and international markets. There is market for NTFPs, but existence of market does not assure the access to the market, which is quite often very difficult to get for NTFPs.

At present, the market and trade channels of most of the NTFPs follow a general pattern of forest/meadow to village to roadhead or trade center, then on to larger trade centers or India. The NTFPs produced in remote areas are sold through a long marketing channel which is inefficient and costly from the perspective of the collectors. The present trade channel is not providing the fair share of profits to collectors. The market is operating for a number of decades but is imperfect, still having only a limited number of wholesalers. To improve the market a number of strategies can be developed.

Improvement in communication about markets, prices and other concerns to collectors and traders can help to increase income of collectors. Lack of information and mis-information seems to be major reasons for not getting a fair price of their goods.

It is generally felt that local people in remote area are cheated by contractors or by other brokers. But it is important to recognize the role of brokers and middlemen, they are not necessarily a bad element of trade. In fact, they have to take a great risk in NTFP trade and without them trade would be very difficult. But establishment of village cooperative and reducing the number of intermediaries can increase the efficiency in trade (see Box 2).

Another strategy that can be adapted by local company is to target markets that demand environmental, social equity, and high quality standards for the products. This strategy has been followed by the Humla Oil Pvt. Ltd., while searching other possibilities and diversifying its market.

The Humla Oil Pvt. Ltd., initially, focused its marketing efforts in South Asia maintaining the quality and environmental concerns differentiating its products from the bulk of

Indian essential oils, which dominate the market by stressing the quality and eco-sensitivity of the oils. Later, the company attempted to access the environmentally aware customers (see Box 2).

These targeted essential oil buyers promote environmental sustainability and equitable distribution of business benefits within communities. The buyers, therefore, not only have a moral obligation, but marketing commitment to help ensure that the raw and semi-processed materials that go into their products are harvested in a sustainable manner and that the generated revenues are equitably distributed.

## 4. CONCLUSION

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This paper has provided an overview of current conditions on production, management, and utilization on NTFPs in Nepal. Some major issues have been identified and a range of alternative strategies proposed.

Nepal is still rich in a variety of NTFPs. The use and trade of these products remains a necessary part of many people living in rural Nepal. These resources however, and the environmental base they depend upon, are deteriorating.

The experiences gained from the field implementation of a verity of projects provide an indication that it is possible to promote NTFPs for both economic development and biodiversity conservation if a careful link is made between an enterprise and the biodiversity resource. Providing needed technical supports to local user groups is necessary at the beginning to create this link and make it viable.

From the careful analysis of the prevailing situation a number of issues and problems has been raised. This forum of NTFPs stakeholders is requested to provide further guidance on the major issues -- production and harvesting management, property rights and institutionalization of management system, local value addition, and marketing and trade -- by pinpointing the future strategies for addressing problems related to policy and legislation, research, the technology and information gap, extension and other supports for the utilization of NTFPs for environmental conservation and economic development for the greater benefit of local people.

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