

Linking Conservation to Business and Local Communities: An Approach to Sustainable Management of *in situ* Biodiversity in Nepal¹

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Abstract

An emerging alternative approach to biodiversity conservation focuses exclusively on creating market-based incentives for participatory local conservation activities that complement the strict conservationist approach of traditional environmental organizations. The approach works from a community enterprise perspective on biodiversity conservation and sustainable resource use, instead of protected area management. Since 1994, ANSAB has been developing and testing this approach in biodiversity significant areas of Nepal in a participatory action research mode. This article highlights the approach and its strategies, outcomes, and lessons learned with a specific example of Humla, Nepal.

The strategies to address the challenges in linking conservation to local enterprises and communities are presented. The impacts of the strategies on biodiversity conservation in terms of improved management, threat reduction, and adoption of conservation practices are evaluated. The impacts of the enterprise and conservation activities on local communities are also documented.

Key words: *threats to biodiversity, sustainable use, participatory approach, community forestry, biodiversity conservation, enterprise development, monitoring, non-timber forest products, and Nepal*

Introduction

Since 1994, Asia Network for Small Scale Bioresources (ANSAB) has been developing and testing an alternative approach to biodiversity conservation in biodiversity significant areas of Nepal in a participatory action research mode. This approach focuses exclusively on creating market-based incentives for participatory local conservation activities. The approach differs from the strict protected area management concept followed by the traditional conservation organizations. The program is designed from a community enterprise perspective on sustainable resource use and biodiversity conservation.

Based on the action research, experience and lessons learned from the implementation of several projects, this paper highlights the approach of market-based participatory biodiversity conservation, its strategies and outcomes with a specific example from Humla, Nepal.

Background

While small in terms of surface area (147,181 square kilometer), Nepal is remarkably diverse in flora and fauna due to its mountainous topography. Numerous side ranges and shoulders extend in all directions from the main Himalayan chain, creating a complex mosaic of biologically isolated high altitude ridges and deep valleys. The complex vertical topography acts to restrict gene flow across the landscape. Nearly 7,000 species of higher plants are found in Nepal, out of an estimated 9,000 species found in the eastern Himalaya as a whole, 39% are endemic to this mountain range (Myers 1988; Myers 1990). Faunal diversity is also high, including some 800 species of birds.

Nepal's ethnic diversity is also noteworthy, with at least ten distinct ethnic groups present including Newars, Gurungs, Magars, Tamangs, Bhotias, Rais, Limbus, Sherpas and Indian and Tibetan migrants.

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Despite the enormous biological wealth of species found in the country, Nepal is one of the world's poorest nations. Per capita GNP is estimated at \$222 (1998/99). The population growth rate is approximately 2% per annum (1999 estimate for total population is 22,367,048), estimated life expectancy at birth is 58.3 years, adult literacy is estimated at 46% but only 29% among women, and the infant mortality rate is estimated as 67 per 1,000 live births (Central Bureau of Statistics, 1999).

Nepal does have a fairly extensive Protected Areas network covering nearly 18% of total land area (DNPWC, 1999). Even with the extensive Protected Areas network, Nepal's natural resources are being exploited above their sustainable capacity (WCMC 1992; Yonzon 1993). The biodiversity of Nepal faces a variety of pressures. Internally the local population continues to rely on the forest and pasture area of this region for fuel, fodder, timber, and a variety of non-timber forest products (NTFPs). The subsistence demand for these natural resources is increasing along with the population. At the same time demand from the outside markets for NTFPs without an internal system of sustainable harvesting has induced a more serious threat.

This demand has resulted in over harvesting of some species in order to supply to the markets of India and the developed world. Collectors of these products are generally the poorer sections of society and lack viable economic alternatives to uncontrolled collection. As demand from traders increases, so does the extraction of natural resources exerting an increase in pressure on local biodiversity. Preliminary indications have shown a decreasing supply of NTFPs in portions of this region. Because a vast area of this region is outside the Protected Area System, community-based conservation approach is the only option to slow the rate of biodiversity loss.

NTFPs are exported to India, Hong Kong, Singapore, Japan, as well as France, Germany, Switzerland, the Netherlands, the USA, and Canada. These products 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 ecosystem and plant resources that produce these products are significant to the society as a whole.

These products were previously an understudied and neglected resource in Nepal, despite their multi-million-dollar export earnings potential (Edward 1996; Subedi 1997), importance to poor populations, and significance to biodiversity conservation. But these resources are being overused and degraded (Edward 1996; Malla *et. al* 1995; Hertog 1995; Karki 1996; Sharma 1996).

Conceptual Framework

Market-based participatory biodiversity conservation approach recognizes NTFPs as a product group that has potential for local economic development as well as ecological conservation. Several factors are responsible for the cause of participatory conservation of these resources in a productive, sustainable and equitable manner.

Conserving biodiversity and promoting commercial use of NTFPs is a complex process that requires a diverse and risky technical activity. In a simplified conceptual framework (see Figure 1), three sets of indicators (dependent variables), namely ecological sustainability, economic efficiency and social equity are taken as a measure of superiority or inferiority of

the commercialized system with the assumption that the higher degree of conservation, higher productivity of economic benefits and their equitable distribution are desirable.

The state of these three variables is determined by both internal and external factors which intersect each other. Understanding the relationship of these factors to dependent variables provides us with ways to intervene in the system for desirable outcomes.

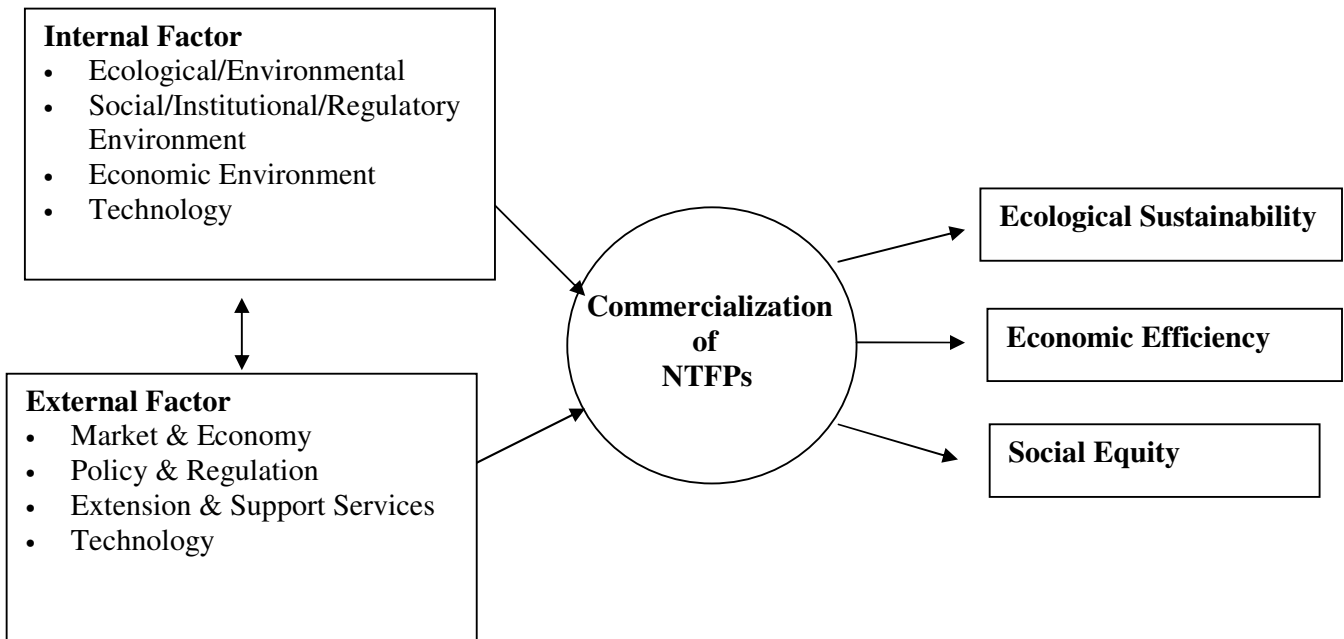


Figure 1. Conceptual Framework.

Strategic Actions for Conservation: A Case of Humla Project

Considering all the factors, as depicted in the conceptual framework, the approach is to create market-based incentives to local communities for biodiversity conservation. In the action, the approach is participatory, flexible and innovative, but clear in terms of achieving commonly agreed upon objectives. The main strategic actions that were undertaken together with local people and other stakeholders in Humla Community-Based Ecosystem Management Project in Nepal are presented below.

Site Assessment: Biological Resources and their Significance

Site assessment is the usually the first steps for initiating a conservation program. Our assessment of Humla site is summarized below. Situated in the high mountains and Himalaya of the Northwest corner of Nepal, Humla is one of the most remote and neglected districts of Nepal. Humla lies between the distinct botanical regions of the Eastern and Western Himalaya. Its geography, remoteness and isolation have created a region of high floral diversity, with distinctive vegetation, including many internationally traded plant species.

The main biological resources used in the project area are forests and alpine grasslands. The project's more than 51,000 hectares of forest, scrub and grassland, representing almost three-fifths of the total land area, are the natural habitats for about 1,500 species of plants.

These resources not only fulfill the subsistence needs of the local people but also help them generate cash income. These resources provide trees, shrubs, herbs, and a variety of products from them - timber for building houses, wood for making agricultural tools and implements, fuel-wood for cooking and heating, fodder for animals, and a variety of non-timber forest products (NTFPs) for medicine and trade. For local people, NTFPs are found more valuable than timber products from an economic as well as cultural point of view.

Stakeholders and Their Main Interests

The stakeholders who are involved in the forest management and utilization are the actors for any conservation action. So, the forestry stakeholders of the project area were identified and their interest in biodiversity management and use was also assessed. The identified stakeholders and their interest in biodiversity of the project area are given in the table below.

Stakeholders	Main interest
FUGs	<ul style="list-style-type: none"> • Control and manage their forest and pastures • Improve technical and social knowledge/skills for the sustainable utilization of local resources • Increase group revenue and community development activities
NTFP Collectors	<ul style="list-style-type: none"> • Maintain access to resources • Increase cash income in a sustainable way • Optimize collection and post harvest activities
District Forest Office	<ul style="list-style-type: none"> • Conserve and manage forest resources in a sustainable way
Local development bodies (VDC, DDC)	<ul style="list-style-type: none"> • Undertake community development activities • Manage resource conflicts
Local NGOs and Projects	<ul style="list-style-type: none"> • Assist in community development by mobilizing communities and their resources
Humla Oil Pvt. Ltd. (HOPL)	<ul style="list-style-type: none"> • Get sustainable supply of raw material at reasonable price • Maximize distribution of economic benefits to local shareholders • Optimize operations for long term stability

Note: HOPL is the enterprise that was developed to create an economic incentive to the collector community.

Threat Analysis – Identifying Opportunities and Challenges

The threats pertaining to the biodiversity were identified and ranked in the participation of the stakeholders. To encounter the threats and to increase the benefit from the biodiversity, opportunities available to the stakeholders and challenges associated were examined.

A participatory assessment in 1995 revealed that the complex ecosystem of Humla was threatened by over-harvesting of commercial plant species as well as overgrazing, slash-and-burn farming, uncontrolled burning of pasture and forests, and unmanaged harvesting of timber, fuel wood and fodder. These practices 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.

The main opportunities for biodiversity conservation were a) institutionalization of resource management system and recognition of local stewardship over the biodiversity, b) creation of economic incentives to the local stakeholders to conserve the biodiversity through sustainable use of it, c) increasing the resource management knowledge of local stakeholders. And the main challenges for the sustainable use of in situ biodiversity identified fall under (a) sustainable harvesting system, (b) policy, regulation and practices, (c) market system and marketing support services, and (d) science and technology.

After the analysis of these challenges and opportunities we concluded that proper support to forest user groups (FUGs) in including NTFPs in operational plans for the management, harvest and sale, along with the establishment of enterprises that use these products, can achieve the broad objectives of community development, income generation to rural poor, and conservation of biodiversity. It was expected that the additional benefits from the biodiversity resources would provide an incentive to local communities to identify and take action against both internal and external threats to biodiversity.

Primary Goal and Main Objectives Setting

To encounter the threats exploiting the available opportunities and addressing the challenges, goals and objectives were set. The primary goals set with the stakeholders were to a) conserve the natural resource base, b) commercially use the local natural products in a sustainable manner, and c) assure benefits are long lasting and equitably shared by the community.

To achieve the goals, the set main objectives were to a) support the commercial development of NTFPs through the creation of a local processing company, b) help institutionalize local natural resource management and conservation practices under Nepal's community forestry system, c) generate management information through biological and socio-economic research and monitoring, c) provide training, education, and extension support to strengthen the capacity of the stakeholders.

Enterprise Development as an Incentive for Conservation

Main sources of the threats to biodiversity were of socio-economic, especially the lack of clear incentive to and realization of biodiversity value by local stakeholders for conservation. As a natural resource-based enterprise could serve to address the sources of the threats, a viable enterprise development opportunity was explored. And an aromatic herb distilling enterprise was identified as a key entry point to provide an opportunity so that the local people see tangible value of biodiversity and realize the need of addressing the threats and also to provide economic incentive to them for conservation.

To match the enterprise objectives with the communities and to flow the enterprise revenues and profits to the resource managers and harvesters, the enterprise was established with the ownership of the local communities. The established enterprise was provided marketing and business development support services to make it competent in the market.

Institutionalization of Resource Management System

The biodiversity of the project area was facing threats of over-harvesting of commercial products, overgrazing, slash and burn farming, uncontrolled burning and unmanaged harvesting of timber, fuel, and fodder. To overcome the threats and benefit the stakeholders from the potentiality of the biodiversity, resource management system was to be adopted and the management system was to be sustained in the long run. In line with community forestry policy of Nepal, the threatened resource base areas were brought under the participatory management system. The system was institutionalized as the management responsibilities and use rights of forest resources were transferred to 24 community forest user groups (FUGs).

The FUGs were facilitated in selecting best management practices offering a range of options to choose for conserving and utilizing their more than 13,000 hectares of forest and pasture land. The capacity of the users was developed and strengthened to harvest, process and market their resources combining indigenous knowledge with external expertise and promoting linkages and coordination among the user groups. To support their innovative resource management and utilization plans, national level forum were used for policy formulation and implementation. Furthermore, integrated conservation education programs were undertaken with the conservation activities to raise the awareness in the communities.

Monitoring

A monitoring system was established to guide the conservation practices, enterprise operation and people's activities in the area. The integrated participatory monitoring system was to generate the biological information flow to aid in developing the community forest management operational plan and in improving resource harvesting practices. The community level monitoring system was very simple and was incorporated in the operational plans of the FUGs.

The FUGs as well as community-based enterprise participated in the data collection. The collected data were analyzed and the forest user groups used the information generated to improve their resource management activities.

Conservation Impacts and Socio-Economic Changes: A Case of Humla Project

The approach was tested in Humla under the BCN funded project. While implementing the concept, several strategies were developed and improved. The impacts of the project with this approach on the biological conservation and socio-economic condition were assessed and documented. The major conservation impacts and socio-economic changes documented through the biological study and socio-economic monitoring are as follows.

Areas Brought under Improved Management

There was no FUG in Humla before the project. People had not realized the importance of the biodiversity conservation and the scope of resource management. When the project initiated enterprise activities that provided them with the opportunity of generating economic incentives, communities were organized into FUGs to manage their resources. Within the project area, 24 FUGs, representing 1,966 households were formed. Small inputs of the project resulted in wide stride in resource management. In the short period of the project, over 10,000 ha of forest and pastureland was handed over to communities to bring under

improved management system. In Nepal, the Humla FUGs pioneered in incorporating NTFPs into forest management plans. The project impact out-flowed to have 15 FUGs formed outside the project area, making a total of 39 FUGs for the entire district of Humla (Subedi 1999a).

Communities significantly reduced pasture burning in the major NTFP collection areas, controlled fires in other forest areas, implemented rotational harvesting and enforced group collection practices at the village/settlement level. To enforce the conservation practices, they developed and implemented natural resource management and harvesting policies, rules and regulations at individual FUG level. The FUGs initiated biological and social monitoring of harvesting practices.

As a result, it was estimated in participatory way that 54% of threats was mitigated during the project period, using the very criteria that were used during the threat analysis (Subedi 1999a).

While designing and implementing the resource management and monitoring plans, community groups as well as other forestry stakeholders generated and documented quite useful information on management of resources for biodiversity conservation and economic development.

Changes in Socio-Economic Condition

Local capacity for natural resource management and community development activities was increased with the formation of FUGs, their federation and other local organizations. This resulted in increased literacy and conservation awareness.

With the establishment of a community owned processing company and improvement in marketing system, collectors became capable to tap the extra income from the NTFPs collected in a planned way. Collectors' selling price of a commercially valuable plant (*Jatamansi*) doubled and the total collectors' annual income from NTFPs tripled from Rs 2,665,436 (US \$39,783) to Rs 10,096,725 (US \$150,697).

The FUGs having forest areas formally handed over to them started receiving fees on the NTFPs collected from their forests. The FUGs of Humla collected a total of Rs 2,187,314 (US \$32,646) in the period of three years from 1996 to 1998 (Subedi 1999b).

This mechanism provided equitable returns to local collectors and community groups and hence created incentives for conserving their resource base. FUGs have been utilizing their fund for strengthening the capacity of their members on resource management, paying watchmen's salaries in order to protect forest areas from the illegal harvesting, improving infrastructure of their villages, and other natural resource management activities. Some of the FUGs that have generated funds have been discussing ways and exploring opportunities to make use of the funds (Subedi 1999b).

It was found from the socio-economic monitoring study that adult literacy increased by 47% in the project area because of awareness on and value of education created through the project. This increased literacy and institutionalized resource management system should make extension and expansion of the conservation practices further in the days to come (Subedi 1999b).

Conclusion

The approach of enterprise-based conservation can positively link enterprise to biodiversity conservation. Lessons learned through our extensive experience in Nepal, as well as other

Biodiversity Conservation Network projects in other countries (BCN 1997), confirm that community enterprises are effective at biodiversity conservation when directly linked to use of *in-situ* biodiversity, involve a community of stakeholders, generate short-term and long-term benefits, and link to an appropriate property rights system. Extraction and production models for biodiversity conservation are not effective when they promote more of the same activities and simply link producers to a market. It is important to establish enterprises that add value to the resources, change destructive practices, and allow communities to feel they are earning decent income.

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