Advances in Community-based Natural Resource Management in the Hindu Kush-Himalayan Region

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Abstract
The Hindu Kush-Himalayan region is among the most fragile and biodiversity-rich areas in the world. It is home to millions of poor and marginalised people who depend on its biological resources for their subsistence. In recent years, there has been unprecedented loss of biological resources as a result of land use change, change in tenure and management regimes, fragmentation of families, external market forces, and so on. The major challenge to the people living in the HKH region is to use these dwindling resources in a sustainable manner. Among the eminent community-based natural resource management practices that have evolved during the recent past are joint forest management in India and community forestry and leasehold forestry in Nepal. These are augmented by other approaches such as co-management of rangelands, enterprise-based, community-involved biodiversity conservation, and participatory transboundary landscape approaches to development and conservation. The notion that 'conservation and management of natural resources are impossible without people's participation' is now becoming a fundamental principle of CBNRM. Since the 1980s, decentralisation and devolution of authority for management of natural resources are being seen across the HKH region, with participatory management approaches evolving as a popular means of carrying forward this movement. CBNRM is increasingly recognised as a visible approach that enhances conservation and sustainable use. However, these initiatives are portrayed as islands of success without much effort to upscale them. The paper highlights some of the recent advances in community-based natural resource management in the HKH region.

Introduction

The Hindu Kush-Himalayan (HKH) region extends from west to east over Afghanistan, Pakistan, India, China, Nepal, Bhutan, Bangladesh, and Myanmar. Approximately, 39 per cent of the HKH region consists of pasture, 33 per cent is covered under protected area networks, 21 per cent is forest, and five per cent is agricultural land. It has an area of 4.3 million sq. km. that sustains about 150 million people and impacts the lives of three times as many people living downstream. In terms of natural resources, parts of the HKH region form one of the ten mega-centres of biodiversity in the world, endowed with a rich variety of gene pools, species, and ecosystems of global importance. The HKH region is not only important as a habitat for plant and animal species, it also harbours a large number of rare and endemic species and is the home of many historical ethnic communities such as the Wakhis, Tibetans, Sherpas, Kirats, Bhutias, Lepchas, and many others with diverse sociocultural values. The long history of human presence in this fragile ecosystem and maintenance of its fragility are indicators of compatibility between satisfaction of community needs through traditional practices and biodiversity conservation. Traditional natural resource management systems such

as Sokshing* in Bhutan; Dzumsa+ in Sikkim; nomadism amongst the Wakhis, Ladhakis, and Tibetans; and Kipat• systems amongst Kiratis and Limbuwans are among the effective traditional conservation measures that address 'sustainability'. This suggests that, in the past, there was a good balance between biological resources and human needs.

However, the ever-increasing population and its needs have imparted immense pressure on available resources. Despite the ecological and economic importance of the biological resources of the HKH, the region has been subject to severe stress and continues to face multiple threats (Brooks et al. 2002). In recent decades, combinations of forces – especially population growth, infrastructure and trade expansion, and technology change – have exerted increasing demands on natural resources. At the same time, nationalisation of natural resources and centralisation of resource management authorities – which caused a loss of arrangements for customary use – have failed to achieve sustainable management of natural resources, especially for common property resources such as forests, upland pastures, and water that are accessed and used by multiple users. The result has been a radical acceleration in degradation of natural resources and increased insecurity of rural livelihoods.

Ecosystems and economy are interlinked in mountain societies where people remain primarily dependent on natural resources. Broadly, five types of farming systems are operative in the HKH region. They are: 1) specialised pastoral systems in which livestock are the source of living; 2) mixed agro-pastoral systems with livestock and small-scale agriculture; 3) cereal-based hill farming systems; 4) shifting cultivation as subsistence farming; and 5) specialised commercial farming systems such as horticultural crops and tea (Sharma and Kerkhoff 2004). Integrated use of these major farming systems provides food, water, fibre, medicines, energy, housing, and cash-generating products upon which the mountain people depend for their survival. Moreover, the environmental services provided by these natural assets are the basis for the physical security of mountain people living in these areas and ensures the sustainability of their production systems into the future. However, sole dependency on these natural resources is mainly due to limited options. In recent years these resources have been facing tremendous pressure from a burgeoning population, with changes in lifestyle and land-use patterns and, most importantly, with changes in management regimes. For example, most of the productive pastures controlled by the community as common pool resources have turned into degraded and unproductive lands. Forests have been lost to different land-use types, often due to unsustainable levels and ways of exploitation. Therefore, depletion of natural resources has directly aggravated the pressures on rural livelihoods through shortage of natural resources such as fodder, firewood, and timber.

In recent years, there has been a growing concern for these dwindling natural resources. Numerous initiatives have been taken at local, national, and regional levels within the HKH countries. During the course of seeking solutions to these issues, two distinct outcomes (amongst many) were seen from local, regional, and global initiatives. They are a) appreciation of indigenous knowledge of natural resource management, and b) recognition of participatory community-based natural resource

* Sokshing management is an indigenous practice that has evolved over many years whereby rural agricultural households and communities maintain certain patches of village forest for collection of leaf litter to produce farm manure.

+ Institutional arrangements for natural resource management by the pipon (village head).

• Land inherited from one's forefathers with rights in Nepal.

management (CBNRM) practices involving local communities and giving due recognition to various forms of governance. Some eminent CBNRM models that have evolved during the recent past are joint forest management (JFM) in India and community forestry (CF) and leasehold forestry in Nepal (Sharma and Chettri 2003a, 2003b). These are augmented by co-management of rangelands, enterprise-based community-involved biodiversity conservation, and participatory transboundary landscape approaches in development and conservation. This paper highlights some recent advances in CBNRM practices in the HKH region that enhance our understanding and enable us to draw appropriate options for policies, technologies, and institutional arrangements for the development and conservation of natural resources.

Advances in CBNRM in the Hindu Kush-Himalayas

Participatory forest management

The notion 'conservation and management of natural resources are impossible without people's participation' is now becoming a fundamental principle of CBNRM. Since the 1980s, decentralisation and devolution of authority for management of natural resources are being seen in government efforts across the HKH region. In 1992, The United Nations Conference on Environment and Development (UNCED) placed a premium on people's participation and promotion of a conceptual shift in both natural resource management and conservation. In response, participatory forest management approaches evolved as popular means. Experiments in such approaches began as early as the 1970s. JFM in India, CF and leasehold forestry in Nepal, and CBNRM in Bhutan are often cited as successful examples of regeneration of degraded forests and effective management of existing natural resources. In all of these examples, community-based natural resource management was seen as an instrument that enhances conservation and sustainable use. Technologies and science for natural resource management are important, but sustainable harvesting processes and equitable distribution of benefits among the communities are more challenging and perhaps of greater importance.

The JFM approach that started in the early 1970s in Midinapur district of West Bengal was an important breakthrough in the management regime and has been widely accepted as a promising approach to resource management (Campbell 1992; Poffenberger and Singh; 1989; Sarin 1993). In essence, JFM involves formal partnerships between foresters, villagers, and government authorities through formation of forest protection committees for the protection and management of state forests. Although there are many variations of JFM, the core idea is that in exchange for their cooperation and assistance, villagers are given free access to non-timber forest products (NTFPs) and entitled to a share of profits from the sale of the regenerated trees when they are finally harvested. This practice received legal support when a national JFM resolution was adopted in 1990 by the Government of India. This new approach to forest management emphasised the shared responsibility for management and sharing of profits with local communities. JFM represents a significant policy shift and the changes are (a) from production for commercial marketing and to generate government revenue, to production to fulfil the needs of forest-dependent communities; (b) from an exclusive focus on timber to attention to NTFPs (firewood, fodder, grasses, leaves, medicinal plants, wild edibles, and others) that are important for the livelihoods of forest communities; (c) from monoculture single-layered forests (of commercially valuable species) to multi-layered mixed forests that include a diversity of trees species; (d) from plantations of a similar age (for ease in harvesting) to plantations of

diverse ages (for a sustained supply of timber and other products to meet community needs); and (e) from custodial management through policing to participatory management.

Information and data from West Bengal in India indicate that these changes have produced results. Forest cover has increased, timber production has increased, conflict between foresters and communities has decreased, and the yield of NTFPs has increased (Joshi 1999). Although JFM undoubtedly represents a change in the state's approach to forest management, there are still two sets of issues that need to be addressed (Saighal et al. 1996; Roy 1992; Saxena 1992). The first set is conceptual; for example, to what extent do communities have economic (as opposed to subsistence) rights to forest produce? The second set of issues relates to the practical problems of managing the JFM programme: assigning forest areas to communities, developing systems for conflict resolution, dealing with different administrative and forest boundaries, and increasing women's participation. JFM is more challenging in mountain areas, as experienced in the hills of North Bengal where growth of forests is much slower than elsewhere, thus testing the patience of communities who have to wait to share the economic benefits.

Community forestry in Nepal is one of the commonly-cited success stories where policy considers its intervention as a process that essentially involves handing over use rights of government-owned forests to indigenous groups of people who customarily hold the de facto use rights of such forests (Gilmour and Fisher 1991). Community forestry gained impetus after 1990 and now covers 9112 sq.km, is managed by 11,595 community forest user groups (CFUG), and benefits 1.3 million households. The area under community forestry in Nepal was 15.6% of the total forest area in 2002. Management by CFUGs of forests has resulted in recovery of the vegetation to form reasonable forests in the hills. This is a significant achievement, because, without forests, most of Nepal's rich biodiversity would have been lost. Local extinction of species has been prevented, habitat corridors created, and successive stages of forests developed. Wildlife sightings have increased, as have livestock and wildlife damage to fields. Although the CF approach has improved livelihoods in many cases, it still has its shortcomings; for example, in inclusion and full participation of traditional users and distribution of benefits to them. Key components of community forestry that affect people's livelihoods are forming the user group, making decisions, and distribution of benefits. Social equity refers to unequal power relations between the rich and poor, high and low castes, women and men, and so on, characterised by both cooperation and conflict. Community forestry should ideally address such power relations with respect to forest management and use as forest user groups gradually gain maturity and experience achieving sustainability. This has yet to happen in most of the community forestry areas.

As the CF programme matured and began progressing, the government of Nepal began other forestry development activities, including leasehold forestry. The 1993 Forest Act provided legal authority for leasehold forestry to assign forest land on a contractual basis to landless people. A project was designed to support the poor families of the mountain region of central Nepal where more than 40% of the population lived below the poverty line with less than 0.5 ha of land per capita for cultivation. The project was conceived to help poor communities by leasing forest lands and is being implemented with support from the International Fund for Agricultural Development (IFAD) and Dutch technical assistance through the Food and Agriculture Organization (FAO). While functioning in ten mountain districts as a project, it is now a national programme. Like

CF, leasehold forestry is contributing to forest development and management of the fragile mountain region by the communities. This is helping in greening the mountains, degradation has decreased considerably, areas are protected, and biological diversity has recovered (Joshi 2000).

All these approaches to participatory forest management are considered to be successes in many respects, especially in terms of evolving shared responsibility for management and in terms of sharing profits with local communities. Second-generation problems are evident in all these approaches, and these need careful handling as they mostly relate to equity in access and benefit-sharing issues. In all of the three approaches to participatory forest management, the planning and design do not specifically consider biodiversity assessment; therefore the impacts in terms of biodiversity are mostly by-products or consequences of community involvement in forestry programmes. Biodiversity maintenance and enrichment are visible in these community-managed, mountain forest areas.

Co-management of rangelands

Rangelands, pasture, and livestock directly or indirectly support the livelihoods of thousands of communities in the HKH region. Numerous ethnic groups – including nomadic and semi-nomadic communities – live in these rich but fragile ecosystems and depend on the pasture land and livestock for their subsistence, mainly because of limited agricultural options. However, acute water crises, limited foraging ground, fodder crises, spread of livestock disease, and livestock depredation by wildlife are limiting the livelihood options to a great extent. Sustainable use of these resources is of paramount interest not only to the sustenance of local communities but also for the conservation of rare flora and fauna, water and carbon sequestration, and preservation of cultural and natural landscapes. Such conditions depict the inexorable link between poverty and environmental degradation, each reinforcing the other. Thus, strengthening ecological coherence and resilience in this farming system through co-management operations is necessary for both conservation and sustainable use of resources. ICIMOD started a rangeland programme in 1996 with the main thrusts being to a) improve community-based rangeland management practices that balance grazing and other economic activities with biodiversity conservation on at least six sites of six regional member countries; b) improve policy frameworks for sustainable use and management of rangeland ecosystems, pastures, and livestock resources; and c) enhance the capacities of six lead partner institutions in participatory planning of rangeland, pastoral, and livestock development (Zhaoli 2004).

In the past four decades, rangeland science shifted its focus from livestock management to rangeland ecology and then to rangeland management. Livestock management is concerned with vegetation composition and grazing mechanisms and with promotion of plant succession for greater grazing opportunities. Rangeland ecology emphasises the importance of understanding rangeland ecosystem processes and environmental conservation while maintaining the goal of optimising livestock productivity on the rangelands. Nevertheless, despite the efforts and the healing of rangelands in some instances, rangeland depletion continued worldwide and, consequently, in the past decade, the focus shifted to rangeland co-management. During recent years, ICIMOD has been advocating a co-management concept to its member countries. Rangeland co-management recognises rangelands as a multiple-use resource rather than seeing it only as grazing land. Thus, all stakeholders – viz., livestock herders, nature conservationists, farm operators, NTFP collectors, and local and central governments – need to be involved in the management and use of the

goods and services that rangelands provide. At the same time, it recognises that the public and, more specifically, rangeland users are important players in decision-making about rangeland management. This concept includes people and their social systems and not just plants and animals. It is not an end point, but rather an approach concerned with social justice and equity, sustainable use of resources, and community-based and community-run initiatives. It is a process of learning by doing through which a multiplicity of different options compatible with both indigenous knowledge and scientific evidence are capable of meeting the needs of conservation and development. The co-management approach is now gaining importance in all the major rangeland areas of the HKH.

Re-assessment of shifting cultivation

Shifting cultivation is the most widely practised farming system in the sub-tropical and tropical zones of the Eastern Himalayan region. In the whole of South Asia, an estimated 10 million hectares of land are under shifting cultivation. Across Asia generally, more than 400 million people, most of them indigenous, are dependent on tropical forests and a majority of them practice shifting cultivation. This makes it the dominant land-use system across much of Northeast India, the Chittagong Hill Tracts of Bangladesh, Eastern Bhutan, Myanmar, Lao PDR, Cambodia, Northern Thailand, Vietnam, and some parts of China. Yet, in many of these places, property rights' regimes have made shifting cultivators illegal squatters on land that has been cropped by their ancestors for countless generations. There has been no concerted effort to address this dichotomy in the Eastern Himalayan region as a whole, despite individual country initiatives.

Shifting cultivation is an agricultural system mired in misunderstanding. It has been generally subjected to policies that are based on questionable perceptions of the ecological and livelihood realities of both the practice and the farmers involved. The great variety of land-use types, the cultural knowledge of the indigenous peoples, and the vast number of plant and tree species associated with shifting cultivation are too often ignored by policy-makers, governments, and analysts. Tenurial arrangements often undermine farmers' motivation for investing in longer term agricultural and forestry practices. For example, the laws and policies of many countries treat fallow areas as empty or unused land without valid ownership, despite the fact that these areas are an integral part of the shifting cultivation cycle.

Although, a wide variety of practices fall under the rubric of 'shifting cultivation', most are marked by a short 'cultivation phase' of one to two years followed by a relatively longer 'forestry phase', usually referred to as the 'fallow'. This traditional agroforestry system has long suffered from a bad reputation, largely because the fallow period was viewed as abandoned and unproductive. It was thus branded as wasteful, inefficient, and a leading cause of deforestation. State policies invariably viewed it as a primitive practice that needed to be stopped (Kerkhoff 2004).

The general opinions on shifting cultivation are 'primitive', 'bad for the environment', and 'not appropriate in the modern world'. Still, intensive and lengthy government efforts that have taken place throughout the region to do away with the practice have not been successful. A growing pool of consensus amongst scientists, policy-makers and well-wishers has recently shown that the condemnation of shifting cultivation as a whole and the perception of fallows as abandoned and unproductive land are largely undeserved – and that, far from being abandoned, fallows are often carefully managed by farmers to provide a wide range of economic products and environmental services.

Some, for example, transform their shifting cultivation fields into secondary forest gardens by planting them with economic trees that provide fruit, nuts, resins, fibre, medicinal herbs, and building materials. This forestry phase, thus, makes important contributions to household economies. Other farmers introduce soil-building trees into their fields which enhance the biological efficiency of the fallow so that soil fertility is rejuvenated, weeds suppressed, and other fallow functions achieved within a shorter time frame. This permits a shortening of the fallow phase without sending the system into a downward spiral of degradation. In turn, this intensified cultivation deflects agricultural pressure from expanding into nearby forests. Rather, forests can be excluded from the shifting cultivation cycle and preserved as community or state forests.

Regardless of whether trees are chosen for economic or biological purposes, or more likely a combination of both, all of these improved forest fallows play an important role in conserving biodiversity and deliver many of the same environmental services as primary tropical and sub-tropical forests. The fallow phase helps in species' regeneration, maintenance of biological richness of forest species, and continuing land coverage by healthy secondary tropical forests. There is, thus, a growing stream of thought that mechanisms should be devised to compensate forest-dwelling communities for the real services that they provide in managing tropical forests. Like farmers all over the world, shifting cultivators constantly try to modify their farming to address the modern needs of larger societies through an innovative process that is based on guiding principles derived from previous experiences, as well as prevailing values about what is appropriate. ICIMOD is playing a vital role in carrying out careful documentation and validation of these practices to demystify the common stereotype of shifting cultivators as farmers engaging in wanton destruction of forest ecosystems – and is portraying them more accurately as forest planters and managers. Through the combined efforts of farmers and policy-makers, a transition process is now visible (Kerkhoff and Sharma 2006).

Biodiversity-linked enterprises

Biodiversity management by the people becomes more evident when it has a utility value and communities benefit from it. The utility could be for subsistence: as, for example, NTFPs form the food security strategy for many indigenous people in the HKH region or for enterprise development that provides income generation opportunities for poor rural households. Some examples of enterprise development with community involvement through use of biodiversity can be seen in the HKH region, but they seem more like islands of success that are yet to receive scaling up efforts. There is great potential for enterprise development with NTFPs, particularly medicinal and aromatic plants; however, the forward linkages have not been properly studied. In general, problems with most of these NTFPs include unsustainable harvesting and lack of management of these resources in both government and community-managed forest and pasture areas. Only a few species are being cultivated on a small scale in private areas.

NTFPs form an important part of the economy of mountain people in the HKH region. They are the primary motivating factor for participating in forest management. These NTFPs are used as food, spices, herbal medicines, tannins, dyes, gums, resins, incense, oils, fibres, and construction materials, and around 200 species are traded in the region. NTFPs are harvested from national forests mainly by wild collection; the situation is not much better even in community-managed forests as NTFPs are open access resources. Specific plans for NTFP management in terms of sustainable harvesting have not been given enough attention in the region. NTFP development

needs more attention all along the value chain, and systematic efforts in backward, forward, and horizontal linkages are necessary (Sharma and Chettri 2003b).

Some successful examples of community involvement in enterprise development of biodiversity products are oak-silk in Garhwal (India); Jatamansi (*Nardostachys jatamansi*) in Humla (Nepal); traditional local paper from lokta (*Daphne* spp) and argeli (*Edgeworthia gardeneri*) in Nepal; and ecotourism in India (Sikkim) and Nepal (Annapurna Conservation Area). Sustainable harvesting of oak leaf for silk-making enhanced the regeneration of oak forests at the project sites in Garhwal Himalaya. Similarly, a medicinal plant enterprise with Jatamansi in Humla, organised through user groups' enhanced restoration and conservation of forests, resulted in increased income that generated interest in conservation. The user groups in Humla expanded the community forest area significantly (912 ha) and applied a sustainable harvesting system as per the operational plan (ANSAB 1999). There are sporadic examples of medicinal plant cultivation by individuals and communities on their private and community lands, *Swertia chirata* in Eastern Nepal is one example of communities developing indigenous technologies for regeneration, harvesting, and processing. These examples clearly indicate that enterprise development with established market linkages supported by local institutional mechanisms is successful.

Other examples are enterprises related to ecotourism that are linked with nature and biodiversity conservation. Two projects supported by the Biodiversity Conservation Network were (a) expansion of Chitwan National Park through community forestry and ecotourism development and (b) Sikkim Biodiversity and Ecotourism. Both projects had substantial impacts as demonstrated by the increased income of the communities and enhanced biodiversity conservation. The case of Sikkim Biodiversity and Ecotourism is given below as an example.

The Sikkim Biodiversity and Ecotourism Project was a collaborative initiative designed to conserve the biological diversity of key destinations. At the heart of the project were participatory approaches that link enterprise operation with conservation action, while merging traditional cultural practices. Working with communities, the private sector, and government, the project built upon their skills, interests, and knowledge to (a) increase community and private sector conservation, (b) increase economic returns from ecotourism services and enterprises, and (c) contribute to policies that meet ecotourism and conservation goals. Participants in community ecotourism plans, training courses, and conservation management used and developed new participatory learning tools that built upon the best practices and positive attributes of Sikkim's natural and cultural heritage. Using the same approach, the project exchanged experiences and expertise with mountain peoples and affiliated projects in Nepal and other parts of India. The achievements of the project are (a) participatory ecotourism planning and implementation in which all stakeholders in the community, business groups (both local and outside), researchers, development workers, and government were involved; (b) participatory conservation practices implemented at the project sites; (c) capacity and skill enhancement for both enterprise and conservation stakeholders increased the incomes of the locals and acted as an incentive for conservation; (d) contributions to tourism planning, policy, and legislation that promoted concepts of and action on environmentally friendly tourism; (e) the biodiversity status of the project site was recorded, baseline information generated, and the community became involved in monitoring to supplement scientific monitoring; and (f) a local NGO called Khangchendzonga Conservation Committee was established and has owned most of the activities started by the project, including the monitoring

of tourism activities, infrastructure, and biodiversity, followed by action on maintenance and improvement (Sharma et al. 2002).

Private sector partnership and CBNRM

Natural resources, such as NTFPs and especially medicinal and aromatic plants, have a great potential for increasing cash economies and markets within and between the countries of the HKH region. Research and development efforts in this sector often neglect the key business players, whereas, in light of the value chain, they are so important. Furthermore, they have often been limited to the national level, whereas the trade in medicinal and aromatic plants (both legal and illegal) is a typical bilateral or regional affair. The ICIMOD/IFAD collaboration with Dabur Nepal is an attempt to involve the corporate sector in research and development on enterprises based on medicinal and aromatic plants for poverty alleviation in the mountain areas of western Nepal (Sharma et al. 2004).

This initiative is part of the pre-implementation research for the 'Western Upland Poverty Alleviation Programme' supported by IFAD: other collaborators are Dabur-Nepal and the Development Project Service Centre in Humla and Jumla. The aim of the trials is to identify suitable medicinal and aromatic plants and their cultivation practices for rural enterprise development of leasehold forestry groups, based on agronomic, economic, and social feasibility – and to develop partnerships between government agencies and the private sector for promotion of NTFPs. One important feature is that Dabur Nepal Pvt. Ltd. is to guarantee buy-back of the produce at an agreed price. Working with the private sector, the following key issues were identified (after Sharma et al. 2004; Anil and Kerkhoff 2004).

Erratic supply and low quality – Despite the great potential, NTFP supplies in the market are erratic and of low quality due to unorganised and unsustainable collection methods. Cultivation could smoothen out supply lines, stabilise market prices, and reduce the market share of substitute products, hence increasing farmers' incomes.

Unreliable markets – The NTFP market is predominantly international, and India is the main hub for produce from Nepal. The Indian markets are speculative and controlled by cartels, and prices change over a short period of time. Companies are used to getting their raw materials at very low prices, and local collectors are not organised enough to exert significant bargaining power. Collective marketing and forest management as well as the availability of market information would strengthen the collectors' bargaining position.

Unsustainable harvesting – Figures estimate that at present almost 80% of the raw materials procured by the companies come from wild sources; and, for certain species, exploitation has brought them to the verge of extinction. High prices and urgent requests from traders sometimes cause the use of unacceptable harvesting methods, such as uprooting, which jeopardises future production. Cultivation would reduce the threat of extinction for certain species. Increased dependency on and benefit for farmers from NTFPs would encourage proper NTFP management and collection practices. Collective forest management could reduce premature collection and over-harvesting of high altitude resources.

Lack of know-how – Local farmers are interested in cultivating NTFPs, but they lack technical know-how and access to sufficient inputs. The most relevant government

organisations and non-government organisations (NGOs) do not have adequate technical capacity to facilitate the cultivation and sustainable harvesting of NTFPs. Additionally, for many NTFP species, cultivation has never been tried. With appropriate training and support, farmers will be able to cultivate NTFPs, particularly in areas with insignificant opportunity costs like leasehold or community forests.

Risk for the target group – Risks for farmers associated with NTFP cultivation have hardly been assessed. Crop failure as well as exposure to market forces and volatile prices can make farmers more vulnerable to food insecurity. Risk sharing between farmers and the company may become a possibility after trials on farmers' fields have been completed.

Policy gaps – Legislation banning the collection and trading of certain NTFPs is subject to frequent changes, and enforcement of bans is not consistent throughout the region. Bans do not serve to protect species, but rather cause illegal markets to open up, resulting in further exploitation of local producers. In general, only a small proportion of the collected NTFPs are reported and significant amounts of royalties and taxes are lost due to illegal practices. A regional policy and cooperation on trade seems a promising mechanism to address this issue.

Conservation on a landscape scale

Conventional protected area management, which has dominated conservation over the last 100-150 years, has tended to see people and nature as separate entities, often requiring the exclusion of human communities from areas of interest, prohibiting their use of natural resources, and seeing their concerns as incompatible with conservation. In recent years, it has been realised that most protected areas in the HKH region are scattered as conservation 'islands'. Many of them are transboundary in nature. Connectivity amongst these protected 'islands' and regional understanding and cooperation between two or more countries are necessary for effective transboundary biodiversity management.

All the eight countries of the HKH region are signatories to the Convention on Biological Diversity; the Conference of Parties (COP) of the convention in 2004 adopted 'Mountain Biodiversity' as a programme of work. These global conventions promote the ecosystem/landscape approach of conservation in the convention member countries. Through this international agreement, the HKH countries have committed themselves to establishing regional and transboundary collaboration, and this is a strong instrument for actual cooperation of the countries signatory to the Convention on Biological Diversity in managing the biodiversity of transboundary landscapes. Actions include strategies to promote integrated transboundary cooperation for sustainable activities in mountain ranges, through arrangements mutually agreed upon by the countries concerned. Regional and transboundary cooperation for research, adaptive management, and exchange of expertise and other resources are also to be promoted to strengthen and improve conservation and management of mountain biodiversity (Sharma and Chettri 2003b; Sharma and Acharya 2004).

An initiative in bilateral cooperation for transboundary conservation of the Mt. Everest Ecosystem between the Sagarmatha National Park in Nepal and the Qomolangma Nature Preserve in the Tibet Autonomous Region of China has grown over the past years through the facilitation of ICIMOD and The Mountain Institute. The four main transboundary issues that emerged for cooperation from the Everest experience are (a)

illegal poaching and trade in endangered species; (b) cross-border spread of forest fires; (c) cross-border spread of livestock disease; and (d) improving local livelihoods. ICIMOD is building on experiences from the Mount Everest Ecosystem and developing programmes for other transboundary landscapes. Through these experiences, it is realised that the existing parks and protected areas 'cannot exist in isolation as islands', neither within countries nor across national borders, if the speciation and evolutionary processes are to be naturally continued. Connecting protected areas by establishing conservation corridors and addressing conservation measures on a landscape level provides an opportunity for both vertical (altitudinal) and horizontal coverage of habitats, ensuring environmental goods and services in the Kangchenjunga landscape. Development and management of conservation corridors should ensure socioeconomic development of local communities. Enterprise-based biodiversity management by local communities shows great potential, as observed already in some instances in the region.

ICIMOD has identified five potential transboundary landscapes for cooperation and management in the HKH region. These landscapes are (a) the Pamir Landscape covering parts of Afghanistan, China, Pakistan, and Tajikistan; (b) the Kailash Landscape covering parts of India, Nepal, and China; (c) the Everest Landscape covering parts of the Tibet Autonomous Region of China and Nepal; (d) the Kangchenjunga Landscape covering parts of Bhutan, China, India, and Nepal; and (e) the Kawagebo-Namdapha-Hkakaborazi Landscape covering parts of China, India, and Myanmar.

In ICIMOD's Kangchenjunga transboundary initiative, an extensive consensus building process was undertaken with communities, conservation authorities, conservation experts, and organisations working in the landscape. Three national-level consultative workshops were organised in Nepal, India, and Bhutan where participation of policy-makers, government officials, academic and research institutions, NGOs, CBOs, and communities was ensured. During these consultations, six potential conservation corridors were identified for feasibility: (1) the buffer area on the Nepal side of Kangchenjunga Biosphere Reserve and Barsey Rhododendron Sanctuary of India; (2) the buffer area on the Nepal side to Singhalila National Park of India; (3) the corridor between Singhalila National Park and Senchel Wildlife Sanctuary in India; (4) the corridor between Senchel Wildlife Sanctuary and Mahananda Wildlife Sanctuary in India; (5) the corridor between Mahananda Wildlife Sanctuary and Neora Valley National Park in India; and (6) the corridor between Neora Valley National Park in India Toorsa Strict Nature Reserve that links up with Jigme Dorji National Park in Bhutan.
For the first time, conservation and development issues were traced down from the community perspective and placed together in a regional forum during the regional technical workshop. This process brought about awareness of the importance of regional cooperation among the member countries for long-term conservation activities of the landscape. As an outcome, India, Nepal, and Bhutan agreed on the landscape approach to biodiversity conservation through corridor development for this landscape where the corridor planning process had been initiated by each of these countries. Research results on natural resource-use patterns, potential micro-enterprises, and policy issues of land-tenure systems from the corridors identified in the three countries are used in corridor planning. Case studies on high-value medicinal plants, such as *Cordyceps* and the policy on it in Bhutan; potential micro-enterprise options and market channels; inventory of biodiversity within the identified corridors; land-use practices and land-tenure systems and traditional practices; and customary laws and their comparison with existing statutory laws, are studied and analysed to support the initiative (Sharma and Chettri 2005).

This initiative revealed that the conservation of biodiversity in ecosystems straddling international borders not only renders services to nature, but also constitutes an opportunity to strengthen processes of socioeconomic development in the border areas of the cooperating countries. Transboundary cooperation also helps countries to meet their obligations under international agreements such as the Convention on Migratory Species and the Convention on Biological Diversity. Hence, landscape-level conservation meets the objective of protecting biodiversity in shared ecosystems and of combining the resources and expertise of regional countries to achieve common goals.

Criteria for successful CBNRM

Community-based biodiversity management in the context of the HKH region is complex – resulting from diverse culture, ecological variations, differences in climatic regimes, and difficult terrain. Future action should focus on the following thematic areas and criteria for effective CBNRM (based on Kothari et al. 2000; Mikkola 2002).

Policies and law

- Take appropriate national policy and legal measures to facilitate community-based biodiversity management.
- Integrate the ability and willingness to tackle external forces of development, commerce, and politics.
- Provide clear linkages between local actors with national and international supporters and facilitators.
- Provide full access of the community to information regarding policies and programmes affecting community-based biodiversity management initiatives.

Institutions, management, and processes

- Build on local knowledge systems and customary practices relevant to conservation.
- Incorporate strong local leadership.
- Build on local community institutional structures, traditional and/or new.
- Ensure clarity and strength of tenurial arrangements with clear demarcated rights to resources.
- Internally generate core funding.
- Orient external institutions (e.g. governments, NGOs, donors) to become facilitators and supporters of local community processes.
- Support continuous capacity building of all stakeholders.

Community and equity

- Primary stakeholders should be clearly identified for decision-making and benefit sharing purposes.
- Ensure equitable decision-making and representation.
- Ensure equitable benefit-sharing and visible benefits (which create a clear link between conservation and local well-being).

Ecological sustainability

- Use conscious regulations based on local and larger ecological constraints, and on understanding of the ecological impacts of community-based biodiversity conservation.
- Undertake constant monitoring and evaluation and develop local indicators.
- Balance rights with strong responsibilities and duties towards conservation and equity.

Conclusions

The HKH region offers an array of natural products for the evolving market based on its rich resources. There are unprecedented opportunities to convert these riches to ensure biodiversity conservation and sustainable development. Conservation does not mean non-use but wise use of biological resources which contributes to sustainable development. However, applying effective management principles and achieving the objectives will only be feasible if a way can be found to translate these broad frameworks into appropriate actions on the ground. Therefore, global conservation initiatives should work more towards population control and poverty alleviation, applying co-management practices to natural resources to make conservation effective and realistic.

Promotion of CBNRM and promoting sustainable economic development at the same time are among the greatest challenges of our time. Ways to achieve these two goals are becoming the focus of increasing attention, particularly within the conservation and development communities. Formal conservation in most countries has, for the last century or more, been treated as the domain of centralised government agencies. The predominant focus has been on the protection of natural resources from the people. More recently, there has been increasing recognition of the value that local communities can bring to the process of conserving natural resources. This paradigm shift has seen the development and application of management models that are designed to integrate conservation and sustainable use.

Most of the initiatives were participatory in nature with institutional and legal support having long-term commitments. These initiatives revealed that biodiversity management by the people becomes more effective and recognisable when it has 'utility value' and communities benefit from it. This utility value was harnessed either for subsistence livelihoods through the consumptive use of resources or for enterprise development providing income generation opportunities for poor rural households. However, these examples represent 'islands' of success of effective management of biodiversity and efforts to replicate and scale them up have yet to be taken. Thus, CBNRM should be people-centred, livelihood-focused, and biodiversity enriching and based on a long-term vision of providing equitable access, a fair share of benefits to local people, and conservation through the sustainable use principle.

People's participation in natural resource management, conservation and development based on economic incentives, and an integrated landscape approach are promising for effective CBNRM. The emerging second generation problems in participatory management should receive focus in future strategies. The second generation issues to be addressed are (a) the extent of the communities' rights to economic benefits, especially in mountain areas, (b) assigning of forest areas to communities, (c) developing systems for conflict resolution, (d) dealing with different administrative and forest boundaries, (e) increasing women's participation, (f) inclusion and full participation of traditional users and equitable distribution of benefits, and (g) promoting social equity in the light of unequal power relations between the rich and the poor, high and low castes, women and men.

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