

From the arid west to the humid east, from the Gangetic plains to the Tibetan Plateau, the Hindu Kush-Himalayas (HKH) present a diversity of biological resources, unrivalled in the world. Numerous species of plants and animals are found only in this region and this high level of endemism places a lot of responsibility on governments, NGOs, and individuals from the countries of the HKH.

Through signing and ratification of the Convention on Biodiversity, all ICIMOD's Regional Member Countries have formally announced their commitment to the conservation and wise use of biodiversity in their respective countries.

As this Newsletter tries to make clear, biodiversity means different things to different people. Whereas at national and global levels, a long-term perspective on sustainable development is the overriding justification for conserving biodiversity, at the local level biodiversity is for food, medicines, and other products that can satisfy basic needs of local communities and individual households. Equally important in many locations in the HKH is the cultural dimension of managing biodiversity.

Since the early days of its operations ICIMOD has recognised the important role it can play in increasing and sharing information on biodiversity in the HKH. A certain evolution in our thinking can be discerned from the different

types of activities undertaken. While the first meeting on this subject (1995) was clearly focussed on National Parks and other Protected Areas, more recently a broader, more people-centered perspective, which included agricultural biodiversity, was embraced.

Indigenous knowledge systems in biodiversity conservation, applied ethnobotany, buffer-zone management, community forestry, tourism, and many other ICIMOD programmes address aspects of biodiversity directly or indirectly. Some of our experiences and thoughts are reflected in the following articles. That biodiversity in the HKH is not only ICIMOD's concern can also be seen in the selection of institutions, references, and home pages that can be found at the end of the thematic section.

We hope that the contents of this Newsletter will inspire others to explore ways to manage the biodiversity of the HKH for the sake of posterity.

Egbert Pelinck
Director General

Biodiversity Conservation in the Hindu Kush-Himalayas

- Status of Biodiversity in the HKH
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Biodiversity Management in the Hindu Kush-Himalayas

Biodiversity in the Hindu Kush Himalayas

PEI SHENGJI

The Hindu Kush-Himalayan (HKH) region has unique functions and roles as it represents one of the world's richest ecosystems in terms of biodiversity. This diversity is a result of the extreme altitudinal differences and associated changes in climate and soil conditions, creating a striking verticality characteristic in natural vegetation. Vegetation types vary from humid tropical forests in the east to the high, cold deserts in the west. The HKH region is host to a wide range of plant resources and wildlife in different ecosystems, resulting from differences in elevation, soil types, climate, topography, and vegetation. Equally diverse are the human

cultures, religions, indigenous traditional systems, and socioeconomic practices. W.J. Hooker (1785-1865), the famous British botanist, observed that, "nowhere in the world can such a diversity of vegetation be seen as in the Himalayas."

Biodiversity and Mountain People

Thousands of species of plants and animal supported the development of early societies, providing the bases for hunting and gathering, agriculture, animal husbandry, forestry, medicine, and industry. Development of the region's mountain economy will depend on sustainable use of biological resources. Sustainable use means maintaining a rich diversity in mountain crops, the genetic diversity of livestock, and proper management and use of forest resources, pastures, and rangelands. In particular, non-timber forest products (medicinal plants, fruit, bamboo and rattan, livestock, and bees) provide opportunities for increasing food production and income generation.

Himalayan Biodiversity in the Global Context

Biodiversity in the HKH mountain system is not only of great significance in the mountain context but also in the context of global biodiversity. The rich biodiversity in ecosystems, species, and genetics found

in the Himalayas is a result of the immense variety of environments found in the mountain ecosystem, and they can be summarised as follow.

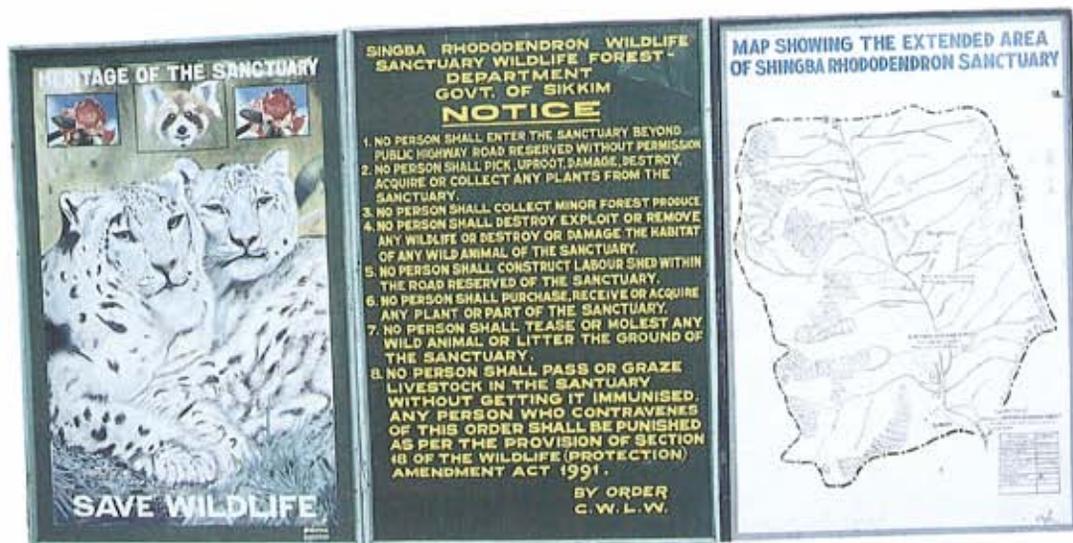
Species Diversity: The number of taxonomical units, especially species, is central to defining biodiversity. The rich flora of the Himalayas are well recognised by the world's scientific community; the total number of species of plants in the region is estimated to be 25,000, or 10 per cent of the world's flora. The diversity of fauna in the region matches that of its flora.

Endemism: The high degree of endemism in the region is another indicator of biodiversity. Hundreds of endemic genera and thousands of endemic species are found in the region. Nine thousand plant species have been reported in the virgin forests of the Eastern Himalayas, of which 3,500, or 35 per cent, are endemic to the region. The Indian Himalayas contain about 50 per cent of the endemic Indian flora, or 3,165 species out of a total of 6,850 in India as a whole.

Agrobiodiversity Resources: The contribution of Himalayan diversity to agricultural development and to civilisation as a whole can be seen from the number of domesticated plants and animals that have originated in the region. At present, among the 666 species of domesticated plants recognised for their economic importance in the world, 136 species originated from China, and 132 species of wild relatives of crop plants are found in India. Many important crops have originated in the Himalayas and there is enormous genetic diversity

mountain farmers; viz, rice, barley, buckwheat, tea plants, and many others.

Protected Areas: Mountain societies of the HKH region have a long tradition in conservation of biological diversity through sustainable management of surrounding ecosystems, in general, and through cultural beliefs such as 'Sacred Sites' of different forests and hills. In recent years, great efforts have been expended to establish protected areas for the preservation of biodiversity and habitats by the countries of the region. Up to 1995, 1,398 protected areas had been established, of which 282 were located in mountain areas. Taking into account the area covered by the mountain systems in the region and the degree of mountain biodiversity, the gap must be reduced by increasing the number of protected areas in different bio-regions in the mountains.



Challenges

Over the last 20-30 years, a transition from a subsistence to a market economy has taken place. Developments in transportation and communications have played an important role in this transition. The electronic media have influenced traditional cultures of mountain societies, resulting in dramatic changes in their value systems. Greater accessibility has resulted in excessive selling of

natural forests and/or them being opened up for cash crop cultivation, e.g., tea, mulberry, fruit trees, rubber trees, and medicinal plants such as cardamom in Sikkim and *Ginkgo* and *Eucomia* in South Western China.

Matching aspirations for economic development with maintenance of cultural and biological diversity in mountain ecosystems is one of the greatest challenges that development planners and conservationists face in the HKH.

Issues in Biodiversity Management

The Hindu Kush-Himalayan region contains some of the richest biological resources in the world. All types of terrestrial and aquatic ecosystems of the Northern Hemisphere are found here, along with hundreds of endemic plant and animal genera and thousands of bio-species that are used by mountain people in all aspects of life, as well as for supply to industry and international markets. However, the biological resource base and its habitats have been changing drastically during the last four decades. Degradation of natural resources and the resulting loss of biodiversity from natural ecosystems are among the main concerns of mountain people in the region. With globalisation of the economy and regionalisation of development cooperation, sustainable management of biological resources and conservation of biodiversity are seen as the main challenges for the future.

The key issues involved in the conservation and sustainable management of biodiversity in the HKH region are the following. Better policies on management and conservation of biodiversity are needed. Such policies could include resource tenures, implementation of conventions, and transboundary conservations.

- Commercial biospecies should be promoted through planned development interventions rather than depending on world resources.
- Mountain communities should be encouraged to participate in buffer zone management and conservation measures should be culturally appropriate.
- Modern science and technology should be integrated with indigenous knowledge in conservation and biodiversity management measures.
- Research into and monitoring of changes in biodiversity and monitoring of flora and fauna should be carried out.
- Inventories of biota in key conservation areas and sustainable bioresource management in different mountain ecosystems are important measures to be carried out.
- Conservation should be practiced both *in situ* and *ex site* to conserve species (e.g., protected areas, gene banks, zoos, and so on).
- Collaboration - transboundary, regional, and international - is important to exchange both knowledge and skills.

Community-focussed Approaches to Biodiversity Conservation^{1/}

EGBERT PELINCK

In the past biodiversity conservation has meant different things to different stakeholders. While the basic aim of government institutions was to protect and manage species, habitats, and ecosystems for mountain farmers, biodiversity conservation involved products that met their basic needs. For example, during a workshop with women and men from the districts of Kullu and Mandi in Himachal Pradesh, India, vivid differences in understanding and perspectives emerged. In a priority ranking exercise on forest monitoring and evaluation, only representatives from the forest department ranked biodiversity as an indicator, while community representatives put it in the context of daily needs that encompass "dense forest with grasses; quality broad-leaved forests; availability of leaf, litter, mushrooms, and medicinal plants."

Although the progress made in establishing protected area systems in the HKH is encouraging, there is an increasing realisation that the biodiversity of this unique mountain ecosystem can never be conserved through this approach alone. Up to 50% of the natural and agricultural biodiversity may well occur outside protected areas, and conserving biodiversity in human-induced/influenced land-use systems is one of the challenges of sustainable mountain development.

One perspective that is gaining ground is that planning for biodiversity conservation should focus on effective integration of natural and social capital. The wealth and diversity of biological and physical resources contributing to the natural capital are subject to varied direct and indirect use intensity, not only from mountain communities but increasingly from the plains. Knowledge and skills in the community contribute the social capital critical to sustainable management of natural resources. These are often untapped by conservation programmes. Only by developing a logical framework covering all types of land use and institutional arrangements in the broadest sense and integrating different stakeholders at specific levels long-term goals be sustained.

It has been realised that vast spatial resources, such as forests and

rangelands, and common property resources, such as water, can only be managed through collective approaches. Optimism about the degree to which appropriate principles of participation are applied is based on evidence from various parts of the HKH that illustrates that mountain communities can adopt and respond to innovations in biodiversity management; and that, at the same time, governments can adjust their policies from the 'restrictive' to the 'enabling'. Considering both natural and human-influenced ecosystems, four broad categories of landscape can be identified in the HKH region (percentages below give the approximate areas covered).

Grasslands, rangelands and 'barren' lands	50%
Forests and shrublands	32%
Crop land	11%
Shifting agriculture	3%

In all these ecosystems, it is people who have mainly influenced the conservation of different plant and animal species. Rangelands with low

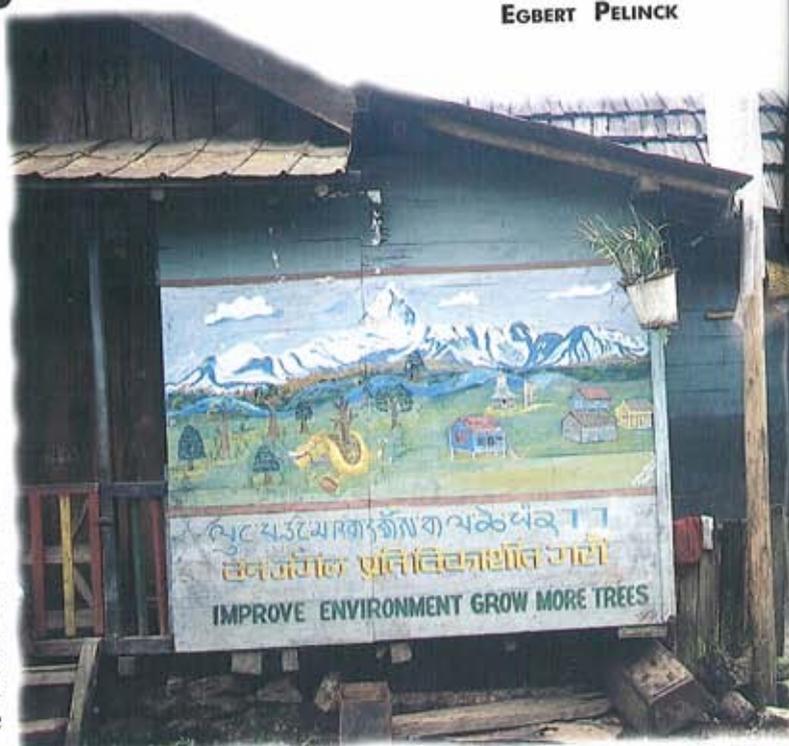


Table 1: Incentives and Opportunities for Community-focussed Biodiversity Conservation

Designation	Intervention/incentive
1. National parks and strict nature reserves	Employment and income generation in park management, tourism industries, buffer zone management, compensation for wildlife damage
2. Conservation and multiple use areas	Ecotourism, forest management, rural development, introduction of renewable energy technologies
3. Community forests	Satisfying local needs for timber and non-timber forest products. Income generation for the community and individual members of user groups from sale of forest products and services
4. Agricultural lands	Compensation to farmers for maintaining agricultural biodiversity and/or higher prices for farm products from rare land races Risk aversion by planting different varieties

^{1/} Modified from a paper presented at the Himalayan Ecoregional Cooperation Meeting, organized by UNDP and WWF, Kathmandu, Nepal, 16-18 Feb. 1998.

population densities and croplands with high population densities may call for different policies; but the entry point is always the people and their needs.

"Why should a farmer from the HKH mountain region be interested in conserving biodiversity?" is the fundamental question challenging many of the current assumptions about community-based approaches to biodiversity conservation in the Himalayas. Fortunately, the diversity of biological resources in the HKH provides the answer to such a question. Rich resources provide incentives and opportunities for sustained use through conservation, provided adequate mechanisms are in place (Table 1).

Sensitivity on the part of policy-makers and natural resource managers is a *sine qua non* for balancing biodiversity conservation with local people's concerns. A case in point is the success of the community forestry programmes in Nepal which has resulted in the return of leopards to rural areas. While the presence of this species also reflects the increase in species on which it preys, conflicts arise when local livestock become part of the prey.

Innovations in Practice

Innovative collective approaches include: the Community Forestry Users' Groups of Nepal, which are now formalising traditional rights and customary use practices in the successful management of mountain forest resources; the *Van Panchayats* of the Uttar Pradesh hills, formulated yet again on the basis of customary rights; the Contractual Responsibility System of China; and the Joint Forest Management initiatives in India - both

Lessons Learned from Community-based Approaches

Ensuring people's participation at all stages. People's participation is vital at all levels of the biodiversity project cycle, including the key stages of planning, implementation, and monitoring.

Establishing linkages between the macro and the micro. Increased incomes for local communities provide a powerful incentive, in the context of motivation and perceptions, in the search for collaborative approaches to biodiversity management. This has to be complemented at the macro-policy level by providing new legislation that has a clear framework for sharing benefits with the local community. Intermediary grass-roots' institutions, having gained the confidence of the local people, are often needed to facilitate and catalyse collaborative approaches to biodiversity management.

Pluralism of stakeholders. An element common to most of the successful examples in participatory approaches to biodiversity conservation is the pluralism of stakeholders. These include local communities, government institutions, research institutions, national non-government organizations, international non-government organizations, and the corporate sector. There is a growing understanding that biodiversity management cannot succeed through an isolated approach that does not take into consideration the interests of all stakeholders.

Presence of an enabling policy and institutional framework. The presence of an enabling policy and institutional framework and responsive and sensitive agencies of the state are prerequisites to sustainable biodiversity management. The absence of such a framework can be a major hindrance to programme interventions.

While these inferences have a critical bearing on what happens in practice, they can only be successful in mountain areas if they are operationalised within the context of mountain specificities and the dominant perspectives on mountain people and resources.

the latter are examples of attempts in participatory forest management; and eco-development committees, conservation groups, and buffer zone committees for biodiversity conservation.

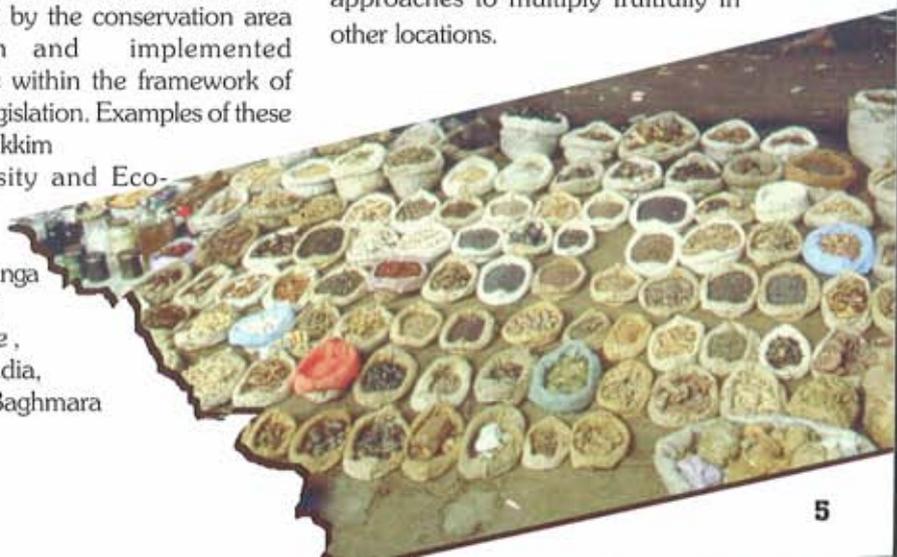
Within the folds of these approaches, many specific projects in the HKH reflect the diversity of opportunities for and the ingenuity of the local people, NGOs, and government institutions. The Annapurna Conservation Area Project (ACAP), established in 1986, pioneered the concept of conservation areas, and over the last fifteen years has evolved into a model for many protected areas in the region and beyond. The ACAP model is unique in that the overall responsibility for developing and implementing the management plan lies with an NGO; there are other sectoral initiatives that have been modelled on experiences generated by the conservation area approach and implemented elsewhere within the framework of existing legislation. Examples of these are the Sikkim

Biodiversity and Eco-tourism Project, Kanchanjunga Biosphere Reserve, Sikkim, India, and the Baghmara

Community Forestry Project, Royal Chitwan National Park, Nepal.

In Pakistan, the involvement of local people in buffer zone management and tourism in the Khunjerab National Park provides much needed income for both communities and individuals. These individual cases, and there are many more, demonstrate that a shift from biodiversity conservation to biodiversity management is needed. They encourage national governments to initiate or strengthen their policies to enable these approaches to multiply fruitfully in other areas of the HKH still under threat of diminished diversity of rich biological resources.

While these projects have helped the local communities, their impact at the macro-level is the positive shift in policy framework that governments are bringing about to enable these approaches to multiply fruitfully in other locations.



Gender Dimensions of Biodiversity Management: Cases from Bhutan and Nepal

JEANNETTE GURUNG

Bhutan and Nepal are countries in which most of the population is engaged primarily in subsistence agricultural activities (81% and 90% respectively). In all countries of the HKH region, women have **primary** roles in the farming systems, providing much of the labour required for agricultural and natural resource management activities that sustain the family. There is a significantly greater degree of sexual division of labour in Nepal than in Bhutan, but women in both countries are involved in similar tasks.

Seed management is one particular area of women's work that is of great significance to biodiversity. In developing countries such as these, where *ex situ* conservation of crop diversity is unaffordable, the future of crop diversity depends on the traditional seed supply systems of local communities. These systems have evolved through the generations to suit particular environments and meet the needs of rural households. As women play the key roles in the management of households and the farms that support them, they have become the managers of crop germplasm and their diversity through the generations. They continually assess the performance of crop varieties, according to their specific needs and environmental conditions, and select seeds accordingly. In both of these countries, traditional seed supply systems are characterised by farmers producing and preserving their own seeds. Often they exchange or borrow from other farmers to experiment with new varieties. In Nepal, it is estimated that as much as 90% of the total seed requirements for cereal and other food crops, and one-half of the requirements for

vegetables, are met through traditional seed supply systems (Shrestha 1996). The sources of these supplies are nature, farmers' fields, and communities. Women do most of the field work, and are thus in a position to gather new varieties through farmer-to-farmer exchange.

In a classic study on the women of Nepal, the role they play in decisions related to what crops to plant is well documented. According to Acharya and Bennett (1981), women alone decide what to plant in 30.2% of cases; 60.4% of the decisions related to what seed to use are made by women alone. In all seed-related activities, women supersede men. They select good seeds for the next season, basing their decisions on taste, colour, resistance to diseases and insect pests, adaptation to soil, and agro-climatic conditions, and preserve them with a variety of traditional methods.

Women exchange seeds, and often present them as gifts to relatives who carry them to far-off locations, hence adding diversity to local seed banks. In some ethnic groups, grandmothers and mothers pass seed selection skills on to their daughters (Shrestha 1996). Their special knowledge of the value and diverse uses of plants for nutrition, food security, health, and income determines which plant varieties should be conserved, based on their usefulness to the family and community. Women take into consideration a plant's multiple uses, providing a balance to the market-oriented pressures that emphasize high yields and uniformity (Eyzaguirre and Raymond 1995).

Women's contributions to the dynamic flow of genetic resource

materials between communities in Bhutan and Nepal are therefore substantial. However, as women's contribution to agricultural production, in general, is not visible and not considered significant by agricultural professionals, this vast hidden network of seed exchange has gone unnoticed. Instead, agriculturalists portray traditional crop varieties as inferior, 'backward' crops that should be replaced by high social status crops requiring provision of seeds, fertilizers, pesticides, training, and technical advice from extensionists. As keepers of the knowledge related to these so-called 'marginal' crops, women themselves are marginalised in the process in societies that give increasing value only to those who can produce cash.

So despite and, perhaps, because of their intense involvement in seed supply systems, women's roles as custodians of local crop varieties and landraces have been greatly undermined by development planners, causing them to lose status and control over their resources. Modern crop varieties are developed to increase productivity and production, whereas women require multipurpose crops. They are rarely asked what their needs are. Packaged with attractive incentives, these new varieties are then delivered to men. Due to the biases of male extensionists, the widespread illiteracy of women, and obstacles to their mobility, rural women in both Bhutan and Nepal are frequently left out of the efforts to disseminate new information and seeds to farmers. The result is that women's crops are becoming marginalised, women are without

access to the new skills imparted to their menfolk, and the base of biodiversity and the indigenous knowledge for maintaining it are being narrowed down without women understanding the process or its consequences (Shrestha 1996).

It is clear that rural women possess extensive knowledge of the environment and are, thus, key actors in the management of biodiversity. Moreover, in both Bhutan and Nepal, biodiversity is the theme of numerous projects and activities, at both the community and policy levels, implemented by NGOs and governments. Indeed, there is a significant amount of rhetoric to participatory development, as well as gender concerns, but much of it is not actualised at the community level. On closer inspection, there is little evidence to suggest that planners, agriculturalists, foresters, and community development workers are aware of **how** to proceed with plans to involve women in the decision-making process, either at the grass roots or the institutional levels.

The little research that has been carried out in relation to gender and biodiversity is mostly confined to an examination of gender **roles** and perhaps how they have changed over time. There is an enormous gap between the fields of gender studies and biodiversity, resulting in ignorance of gender issues and approaches in agricultural and forestry institutions. Even NGOs involved in these programmes are usually unaware of the gender dimensions of their work. Due to this lack of knowledge of and skills in gender analysis and planning, it is highly likely that these community-based projects are simply reinforcing

existing gender relations without giving much thought to such impacts.

Planning to involve women in biodiversity management, at both the grass roots and institutional levels, cannot proceed without considering the following issues. Firstly, more extensive research is needed not only to document gender aspects of biodiversity management, but also to document the culturally-held perceptions of women and compare them to those of men. This would add to the growing body of literature which debates whether women and men in fact perceive their realities differently, therefore forming priorities and values associated with the management of natural resources that differ.

Secondly, internal reorientation at the institutional level, to make organizations gender-responsive, is necessary to bridge the gap between gender issues and the scientific management of natural resources. This requires not only recruiting more women staff and allowing their voices to be heard in senior-level decision-making forums, but also integrating the needs and perspectives of community women and marginalised men from the very inception of programme planning. As evident in the information presented on the situation of professional women in agriculture and forestry, women employed in male-dominated institutions require a more supportive working environment.

During this period of widespread global awareness of gender and development concerns, it is not sufficient for

biodiversity programmes to simply add a few women to their staff and users' groups. They must become aware of the cost of gender-blind programming to safeguarding the world's biodiversity resources and to the status of rural women themselves.

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Managing Agrobiodiversity in the HKH Region

TEJ PARTAP

In the developing countries agricultural is still the mainstay of approximately 70 per cent of the population; and in some countries it is as high as 80 to 90 per cent. The boundaries between biodiversity and agrobiodiversity are not clearly demarcated.

Biodiversity and Agrobiodiversity are like two sides of the same coin. The one with the national emblem represents biodiversity, because natural biodiversity is the heritage of human communities and societies, as a whole, and is not generally priced. The side of the coin giving its value

system. It is the source of resiliency and regeneration necessary for the sustainability of agricultural systems. The self-sufficiency of local mountain farming communities depends on agrobiodiversity. Considering the proportion of the earth occupied by farming systems, agrobiodiversity is a global asset.

Agrobiodiversity within mountain agroecosystems does

most dynamic aspects are the changing perspectives and livelihoods of the farmers - the stakeholders of agroecosystems. The genetic complexity of subsistence agricultural systems in the mountains can provide ecological stability, but does not necessarily ensure economic sustainability. Thus,

mountain farmers have always tried to balance the two factors in every stage of the transformation process.

Today, mountain societies in the HKH region are faced with the dilemma presented by increased populations and economic needs, rendering traditional methods of farming and use of agrobioresources economically unsustainable. At the same time, the new technological options that can transform traditional farming may be ecologically unsustainable in the long run and cause loss of agrobiodiversity from most mountain areas. An exact assessment of this loss in the HKH, at agroecosystems' level, species' level, or subspecies' level - cannot be made without understanding the potential ecological and economic values. Our understanding of the issues of agrobiodiversity in the HKH region is limited, and so far not much is known about the impact of the complex and changing demands of mountain societies on agrobiodiversity.

Therefore, to improve our understanding of agrobiodiversity in the HKH region, a series of studies was commissioned by ICIMOD. The findings were debated in national expert meetings on mountain agrobiodiversity and will be presented in a forthcoming

joint publication of ICIMOD and the International Plant Genetic Resources' Institute (IPGRI). The publication contains papers on the following issues: mountain cultures and agrobiodiversity; mountain agriculture-transformation processes and agrobiodiversity implications; farmers' seed supply systems; diversity of mountain crops; animal diversity; farmer-led *in situ* conservation initiatives; and recovering the lost ground by reshaping institutional responses.

These studies revealed that, in the HKH region, agrobiodiversity and its management is under pressure. Transformation of agricultural systems resulting in land-use changes is having an adverse impact on native agrobiodiversity. The hunger, poverty, resource scarcity, and land degradation faced by a large proportion of mountain households are forcing farmers to look for alternative occupations. Farmers are transforming their lands and farming methods to achieve better production and more benefits, and traditional agrobiodiversity is the loser in this process. Erosion of agrobiodiversity is already apparent in the HKH region.

Inadequate technical understanding of mountain agrobiodiversity is another limitation to conservation management. The main aspect in this is the absence of economic valuation of agrobiodiversity in the HKH region - how much can it contribute to the economy of the community, nation, and global community, and on what terms? How can we assess the returns of investment value on saving agrobiodiversity and how can farming communities be encouraged to reorient their thinking along these lines? We also have little knowledge about the diversity of unique ethnic mountain communities and their micro-agroecosystems or the changes affecting these agroecosystems. In the absence of this

knowledge, it is difficult to assess the degree of appropriate institutional responses needed to contain the loss of agrobiodiversity from the HKH.

Weak institutional mechanisms and poor resource allocation are common in the HKH region. There is a lot of scope for encouraging regional action on and cooperation in agrobiodiversity issues at the political decision-making level, so that the course of mountain agricultural development can be redirected towards synergy with agrobiodiversity conservation. Public awareness is the key to generating appropriate political action both nationally and globally. Changes in agricultural development strategies at national and provincial levels to favour the concept of agrobiodiversity management may be needed to achieve this.

Finally, the welfare of the main stakeholders of mountain agrobiodiversity - the mountain farming communities themselves - will have to become the focus of management and conservation measures, whether in the development of niche-based farming systems, or in the distribution of benefits from farmers' rights or royalties on agrobiodiversity. Such actions may generate an interest among mountain farming communities to protect their agrobiodiversity, thus lessening the need for outside intervention.

Diverse Horticultural Resources and Their Use in the HKH Region

Crop Type	Number of species promoted for cultivation		Approximate number of species used locally
	Major	Minor	
Fruit trees	5	18	150-200
Fruit shrubs	2	5	80-120
Vegetable	8	20	230
Tuber Vegetables	1	6	15
Spices	3	8	40
Mushrooms	1	6	280
Medicinal and aromatic plants	10	50	500
Other plant resources, e.g. fibres, insecticides-	7		50

represents agrobiodiversity, since agrobiodiversity provides people with a living and its value can be assessed in terms of who depends on it and to what extent.

In the context of mountain areas, agrobiodiversity is the fundamental basis of agriculture and the overall economic

not have to be maintained or increased randomly in the name of ecological stability, as is the cause with natural biodiversity. To manage agrobiodiversity in mountain areas, the





Transboundary Cooperation for Biodiversity Conservation & Management

AJAY RASTOGI

Transboundary conservation is receiving more and more attention as nations recognise that their environmental security and social welfare depend upon the conservation and management of biological resources that span political borders. Transboundary conservation is particularly important in the Himalayan region, as many areas of rich biodiversity are located along natural borders. As a result, the concept of transborder protected areas, or nature reserves, is gaining popularity in the region and beyond.

Transboundary reserves are defined as contiguous areas of protected natural habitat, extending nationally across two or more states or provinces and internationally across two or more countries. The main aim of transboundary reserves is to increase the protection of biodiversity beyond the extent possible by any single state, province, or country. While a nation's reserves within its borders can be strengthened by national governments alone, transborder conservation across international borders requires

cooperation from the participating countries, and often a facilitating regional or international organization. The salient recommendations that emerged from regional meetings on transborder cooperation in biodiversity, organized by ICIMOD, are enumerated below.

1. Promote the exchange of views and information on transboundary conservation, through meetings and exchange visits of local community members and park management and government officials of the countries of the region to improve communications
2. Establish dialogue and cooperation between government officials and protected area administrations of different countries on policies related to wildlife management and trade in plants and animals
3. Increase enforcement cooperation and protected area coordination on transborder poaching, illegal logging, and harvesting of rare and threatened species in border areas
4. Establish joint committees between transboundary protected areas to cooperate in developing management plans and common guidelines, research collaboration, and in implementation of

Protected Areas for Potential Transboundary Conservation Cooperation in the Himalayas

Name of Protected Areas	Country	Counterpart Protected Area	Country
Royal Manas National Park	Bhutan	Manas Tiger Preserve	India
Royal Chitwan National Park	Nepal	Valmiki Tiger Reserve	India
Parsa Wildlife Reserve			
Suklaphanta Wildlife Reserve	Nepal	Dudwa Tiger Reserve	India
Royal Bardia National Park			
Tongbiguan Nature Reserve	China (Yunnan)	Pidaung Wildlife Sanctuary	Myanmar
Kanchanjunga National Park	India (Sikkim)	Kanchanjunga Conservation Area	(Kachin State)
Qomolongma Nature Reserve	China (Tibet)		Nepal
Khunjerab National Park	Pakistan (Northern Area)	Taxkorgan Nature Reserve	China (Xinjiang)
Medog Nature Reserve	China (Tibet)	Dibang Wildlife Sanctuary	Myanmar
Zayu Nature Reserve	China (Tibet)	Kakaborazi National Park	Myanmar
Kakaborazi National Park	Myanmar	Dichu Forest Reserve	India (Arunachal Pradesh)

Source: Pei Shengji and Udaya R Sharma, *Transboundary Cooperation in Protected Mountain Areas*, op cit 1998 (page 4).

international conventions and agreements

5. Organize joint training activities on transboundary conservation and collaboration in research, monitoring, and management technologies through regional or bilateral programmes and collaboration
6. Promote participatory management in transboundary conservation at the local level - local communities, the private sector, and concerned institutions should join hands with protected area administrations to ensure participatory planning and management of transboundary protected areas
7. Develop awareness programmes and produce publications on transboundary conservation subjects and laws at national and local levels

Recognising the challenges of transborder cooperation and to initiate a systematic build-up of activities in this area, the World Wildlife Fund (WWF) Nepal Programme and ICIMOD together organized a Regional Consultation on *Conservation of the Kanchanjunga Mountain Ecosystem* in April 1997. The participants in the meeting were government officials from the Department of Forests/Wildlife from the Tibetan Autonomous Region of China, the state of Sikkim in India, together with officials from the central government and Taplejung District in Nepal. They presented overviews on the status of the Kanchanjunga area in their respective countries. Conservation experts, representing international non-government organizations actively involved in the region, were present, and they facilitated an exchange of ideas and information by providing thematic technical reports. The follow-up discussions

Transboundary Collaboration on Conservation and Ecotourism between Nepal and Tibet, China

From June 16 to 28, 1998, a training workshop on Transboundary Biodiversity Conservation and Ecotourism was organized jointly by ICIMOD, the Mountain Institute (TMI), Department of National Parks and Wildlife Conservation (DNPWC), Nepal, and Qomolangma Nature Preserve (QNP), Tibet, China. The workshop was held in Kathmandu and a field trip to Langtang Natural Park was organized. The fourteen-day workshop was designed to share information and knowledge on transboundary conservation and ecotourism; provide basic concepts, principles, and techniques on biodiversity conservation and ecotourism management; and to discuss issues of common interest for future collaboration on transboundary collaboration.

A set of follow-up actions was recommended and drafted, but they still require sanction from the respective governments. These include the following.

- Local level committees will be formed to facilitate transboundary collaboration in biodiversity conservation, protected area management, and community-based ecotourism.
- QNP and HMG-Nepal will collaborate in the control of cross-border trade in illegal animal parts and plants and in wildlife poaching in their respective protected areas by sharing information in a timely and productive manner, by enforcing CITES and respective national legislation, and by pursuing necessary revisions to legislation and/or regulations to provide a better legal basis for transboundary conservation - including the extradition of illegal poachers and traders.
- Feasibility studies will be carried out jointly to study the impacts and opportunities for transboundary community-based ecotourism to improve livelihoods among border peoples and to support conservation of natural and cultural resources.
- Both sides will help to prevent wildfires in border regions by conducting wildfire and conservation awareness programmes among forest and pastureland users, and by facilitating access to alternative (cross border) or improved pastures to compensate for loss of forest grazing land.
- QNP and DNPWC will request support from TMI and ICIMOD to continue to facilitate transboundary exchanges on a regular basis, to promote the sharing of experience, and to strengthen collaboration.

centred around development of a common framework for three key aspects: (i) biodiversity assessment and monitoring; (ii) sharing information and management; and (iii) sharing conservation benefits with local people. Deliberations on these three key aspects led to a set of recommendations and a follow-up action plan to be pursued jointly in future.

One extremely positive development that has taken place since then is that His Majesty's Government of Nepal has declared an area of 1,014 sq.km. as the Kanchanjunga Conservation Area. The contiguous portion in India already has the status of a biosphere reserve extending for 1,784 sq. km., thus strengthening the long-term prospects of transborder biodiversity

conservation in the Kanchanjunga mountain ecosystem.

Another important meeting to develop international collaboration in biodiversity conservation in the Himalayan region was organized jointly by the United Nations Development Programme and the World Wildlife Fund. The Himalayan Ecoregional Cooperation Meeting, held in Kathmandu in February 1998, had delegates from regional countries: China, India, Nepal, Pakistan, Bhutan, and Myanmar - and from concerned regional and international organizations. Transborder cooperation for conservation of biodiversity featured high on the agenda.

Applied Ethnobotany for Biodiversity Conservation

AJAY RASTOGI

The traditional use of biologically-diverse resources in the HKH region not only reflects a varied resource-use pattern, but also variety in the methods of maintaining biological diversity in mountain ecosystems by the mountain people. Natural resource management systems are localised systems that form the basis for decision-making for rural people. Since the majority of land-based production systems in the Himalayan region operate under indigenous knowledge systems, they are not only of value to the cultures from which they evolve, but also to scientists and planners wishing to improve rural living conditions. However, there is tremendous pressure from socioeconomic change and ecological knowledge and cultural traditions that have been continuously developed and transferred from generation to generation are being lost.

Participatory, community-based work to document, apply, and build on local knowledge of botanical resources and their management can help cope with such changes without losing valuable local knowledge and biodiversity. Therefore ethnobotany applied to conservation and community development has become extremely important. Understanding indigenous knowledge in mountain communities in relation to biodiversity resource management is one of the key issues in development of the HKH region today. In view of this, ICIMOD established a programme on **'promotion of sustainable and equitable use of plant resources by the application of ethnobotany'** in six HKH member countries.

This three-year programme was launched in 1995 in close partnership with UNESCO, WWF, and the Royal Botanical Gardens at Kew's initiative

on People and Plants, with financial assistance from DANIDA. Among the many objectives of the programme are to develop the application of ethnobotany to the management and conservation of plant resources through capacity building, supporting research, and promoting action-oriented field projects. In order to meet these objectives, the programme organized five field training workshops at the national and subregional levels and supported 15 case studies encompassing various themes. Many young ethnobotanists from the region were enabled to participate in regional meetings.

Ethnobotanical studies during the course of the project focussed on the themes described below.

Cultural beliefs and practices that underlie resource management and conservation of biological diversity: Documentation of the *Jingpo* community's knowledge systems on the sustainable management and conservation of medicinal plants in south-west Yunnan and the *Qiang*(s) indigenous knowledge of medicinal plants in Maoxian county, Western Sichuan, China, are two examples of work on this theme.

Findings - The uses of medicinal plants and animals in Chinese traditional medicine often vary from one system to another. At the same time, the traditional medicine systems of minority communities are poorly represented in the major *Ghong* system prevalent in China. Some communities, such as the *Qiang*, are undergoing rapid transition and, coupled with the decline in biodiversity of medicinal plants, the knowledge base is eroding rapidly. There are limited systematic records of the *Qiang*'s traditional health care system because, firstly, most of the knowledge is passed on orally and, secondly, they have their own script. Further, most of the young people learn to read and write in

the main Mandarin dialect. The project, in its small way, has helped document the *Qiang*'s indigenous knowledge and promote a wider understanding and legitimisation of the contributions of traditional skills and community health care.

Forests: Traditional indigenous practices for maintaining forests as a sustainable resource system, which is also characterised by non-wood forest product management systems, are giving way to commercial pressures. Examples of studies focussing on this theme are: ethnobotanical survey of *Allium hookeri* and *Allium wallichii* in Tengchong county and a case study on conservation of *Sinopodophyllum hexandrum*, *Diphylleia sinensis*, and *Fritillaria cirrhosa* in Zhongdian county in Yunnan Province, China.

Findings - The species *Sinopodophyllum hexandrum* and *Diphylleia sinensis* were scientifically validated a decade ago as containing anti-cancer compounds. This led to a very high level of demand on these two species for chemical extraction. There is a dire need to supplement availability from cultivated sources. *Fritillaria cirrhosa* is considered one of the best broad spectrum medicines for respiratory diseases. Therefore, this project tried to document local classifications and uses of the three species and set up demonstration plots in farmers' fields to standardise and promote their cultivation and marketing.

Agroforestry: With increasing demographic pressure, more and more natural plant resources need to be integrated into sustainable cultivation systems with focus on linkages between traditional knowledge and agroforestry management. The ecology and indigenous management techniques used in the home gardens of the *Marma* community in the Chittagong Hill Tracts of Bangladesh and the application of indigenous knowledge of fodder trees in Kalikasthan, Nepal, fall into this area.

Findings - Farmers obtain a variety of products from agroforestry plots and home gardens. They maintain spatial arrangement patterns for species with a great deal of consistency in species' composition, irrespective of farm categories. While the tamarind tree (*Tamarindus indica*), *Aegle marmelos*, *Citrus grandis*, and *Moringa oleifera* are common features of Marma home gardens in Bangladesh, *Litsea monopetala*, *Ficus sermentosa*, *Bauhinia purpurea*, and *Ficus hispida* are common fodder trees in Kalikasthan, Nepal. At both sites, sharing of tasks between women and men is observed; women are more laborious and contribute a significant proportion of their labour to household and on-farm activities.

Swidden and settled agriculture: Swidden cultivation is a reflection of the man - environment relationship in tropical mountain regions. Indigenous agricultural practices are based on very specific knowledge of plants, conservation practices, and land-use systems. Sustainable agriculture is one of the most important components of rural development and environmental management in the HKH region. Study of the Alder (*Alnus nepalensis*)-based sustainable cultivation practices of the *Angami Naga* community in Nagaland, India, and the indigenous management of fruit plants in Drosh valley, Chitral, Pakistan, are examples of studies on the sustainability of traditional agricultural systems.

Findings - Alder tree stumps, over a 100 years' old, can be seen in the swidden fields of the *Angami Nagas*. This nitrogen-fixing tree is pollarded, usually after 4-6 years, following the *jhum*/swidden cycle of 2 years of cropping and 2-4 years of fallow. The wood is used for domestic needs and the leaves are left in the field to retain moisture, provide mulch, and add humus to the soil. To a great extent, all practices relating to propagation, pruning, harvesting, protection against insects, pests, diseases, and grazing animals; storage and drying of fruits; and practices maintaining soil fertility were mostly traditional. The farmers showed a marked preference for traditional varieties, thus contributing to conservation of genetic resources through sustained use.

Protected areas, biosphere reserves, and buffer zone management - options that lay out the strengths of indigenous knowledge in conservation of biological diversity: Historically, many mountain communities have formulated and established their own traditional conservation method, including protection of plants, animals, and ecosystems. The study 'ethnobotanical survey and assessment of the impacts of harvesting of medicinal herbs in the buffer zone of the Valley of Flowers National Park, Garhwal, India,' looked at this issue in greater detail. Other examples include investigation of the ethnobotanical uses of local plants in the Margalla Hills, Islama-bad, Pakistan, and a study on community based forest management at the Sal (*Shorea robusta*) forests at five sites of the Chitwan district of Nepal.

Findings - There is rich environmental diversity in the Valley of Flowers National Park. Some 112 species of medicinal plants have been reported in the survey. Of these 23 species are rare and endangered - five species are enlisted in the Red Data Book of Indian plants. Population studies gave us the current conservation status of some of these plants in the three main zones of the park and its buffer area. In the Margalla Hills National Park, a total of 160 plant species is found to be ethnobotanically



important. In terms of usage, 102 species are used as medicines, 35 as fuelwood, 74 as fodder, and 51 are for miscellaneous purposes. It was observed that for 80% of nearly 1,000 households inside the park, wood is used for fuel. This and other factors have caused severe degradation in some parts of the park. Besides meeting subsistence needs, almost 26 species in the park are traded in local markets. The study documents all the 160 plant species that are currently used and makes recommendations for improving the prospects of long-term conservation of the park.

Ethnobotanical inventories: These include plant uses, folk classification, plant use patterns in relation to social organization, ecosystems, taboos, rituals, etc. Three studies looked at certain aspects of ethnobotanical inventories in greater detail: the ethnobotanical and cultural background of ethnic communities in forest resource management in the Chittagong Hill Tracts, Bangladesh; investigation into the status of indigenous medicinal plants and their conservation in the Newar

community of Bungamati, Lalitpur, Nepal; and ethnobotanical studies of medicinal plants and traditional

health care practices of the Gurung community in Bichauri village, Lamjung, Nepal.

Findings - These preliminary studies attempted to compile systematic ethnobotanical inventory focussing on medicinal plants, assessment of the current use pattern of herbal medicines, and their availability. They also discussed the problems of *Dhami(s)* and *Jhakri(es)* (local healers). It is observed that many local healers, particularly in Bungamati, which is close to the large urban establishment of Kathmandu, find it hard to live on their traditional occupation alone. Although, people consult traditional healers for a comparatively larger number of diseases in Bichauri; total reliance on traditional medicine is restricted to only 1.03 % of residents. In terms of availability of medicinal plants, Bichauri has access to quite a large forest area and most of the plants are found there. In Bungamati, the study stimulated cultivation of 32 species of plants found economically useful to the villagers, amongst which 22 are also medicinal plants, on the premises of Tri Ratna Cooperative School.



MANAGING INFORMATION ON BIODIVERSITY

The Integrated Conservation Networking System (ICONS), an information management system established with the support of the World Conservation Union (IUCN), Norwegian Agency for Development (NORAD), and International Development Research Centre (IDRC), is a system designed specifically to meet the needs of non-government, rural, and indigenous organizations and individuals working on biodiversity conservation in developing countries. Currently being tested, the ICONS system is easy to learn and use and can be used for the following.

1. Store and plot information about geographical areas and record or attach area attributes such as species' distribution, habitats, management plans, surveys, and reports
2. Compile multimedia encyclopedias on any topic, concept, or term
3. Store web site addresses and information characterising the sites and their developers, and record mailing lists, use net discussion groups, WAIS resources, gopher servers, and site management information
4. Catalogue and annotate treaties, conventions, protocols, legislation, customary laws, regulations, and other legal instruments
5. File contact information and profiles of client groups, NGOs, government agencies, businesses, and services
6. Keep track of information on indigenous peoples, cultures, and ethnic groups
7. Track projects, together with complete project profiles - including key contacts, locations, funding, project descriptions, reports, and evaluations
8. Catalogue any type of text, image, or sound file and store virtually anything - abstracts, aerial photos, maps, diagrams, annual reports, references, catalogues, checklists, newspaper clippings
9. Catalogue scientific and traditional knowledge of plants and animals - species' distribution, references to source materials, bibliographies, surveys, taxonomy, research, management, protective status, and experts

ICONS is programmed in Microsoft Access 2.0. A beta version of the ICONS software is available free of charge to organizations in developing countries and to IUCN members with a small charge to cover shipping and handling costs. The software can also be downloaded free of cost from the ICONS web site <http://www.iucn.org/biodiversity/html/>. The ICONS project has also developed the **Indigenous Knowledge and Biodiversity CD-ROM**, an exhaustive collection of documents and databases related to biological diversity and the implementation of Article 8(j) of the Convention on Biological Diversity. For more information on ICONS, please contact: Patricia Henry, 3227 11th Avenue NE, Seattle, WA 98115, Tel: (206) 527-0119, Fax: (206) 527-0119 (cell fax), Email: pdh@u.washington.edu or pdh@igc.org, URL: <http://www.iucn.org/biodiv/>

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ICIMOD

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A Profile

Kunming Institute of Botany

The Kunming Institute of Botany (KIB) is one of the leading botanical research institutions established under the Chinese Academy of Sciences. Established in 1938, the main scientific research tasks of the KIB are to carry out studies on the exploration, use, and protection of plant resources on the basis of basic, theoretical botanical study with a focus on the Chinese Himalayas - from Yunnan in the Eastern Himalayas to the Tibetan high plateau.

KIB has four research departments, Kunming Botanical Garden, and five technical support service units. Among the 365 full-time staff, 99 are professors and associate professors. The institute confers MS and Ph.D. degrees in botany, phytochemistry, and ethnobotany.

The four research departments of KIB are (i) the Department of Phytotaxonomy & Phytogeography, (ii) the Department of Phytochemistry, (iii) the Department of Plant Physiology, and (iv) the Department of Ethnobotany.

Since 1991, KIB has collaborated with ICIMOD on Rehabilitation of Degraded Mountain Ecosystems; People and Resource Dynamics in Mountain Watersheds (PARDYP); Biodiversity in the Eastern Himalayas; and Applied Ethnobotany. More than forty KIB staff have participated in ICIMOD workshops and training courses since 1992. KIB is a key institution for mountain biodiversity research in China and, as a partner institution of ICIMOD, it can play an important role in integrated mountain development and conservation in the Himalayan region.

Regional Biodiversity Conservation Institutions

The primary responsibility for conservation and management of biological diversity in each country is vested in the government agencies such as the Forest, Wildlife, and Environment departments. The organizational structure of these departments extend from the authority to make decisions at the national level to management input in nature reserves and forests. For agricultural biodiversity conservation and management in the regional countries, many government agencies are responsible - such as the councils/bureaus/ departments of agricultural research, plant and animal genetic resources, etc. In addition, there are several other organizations in the government and non-government sectors that figure prominently in promotion of biodiversity conservation in each of the HKH member countries and some of them are listed below.

Nepal

The King Mahendra Trust for Nature Conservation (KMTNC)
Jawalakhel, P. O. Box 3712, Kathmandu
Tel: 526571/526573
Fax: 526570
E-mail: kmtnc@mos.com.np

The Mountain Institute
P.O. Box 2785, Bishalnagar, Kathmandu
Tel: 419356, 414902, 419224
Fax: 977-1-414092
E-mail: tmi@mos.com.np

The World Conservation Union (IUCN)
Nepal Country Office
Dhobighat, P.O. Box 3923, Jawlakhel
Tel: 528761, 528781
Fax: 521506, 52450
E-mail: iucn@mos.com.np

China

National Environmental Protection Agency
No. 115 Nanxiaojie, Xizhimennei
Beijing 100035, China
Tel: 086-010-6151755
Fax: 086-010-6151768

Kunming Institute of Botany, CAS
Heilongton, Kunming 650204, China
Tel: 086-0871-5150660
Fax: 086-0871-5150227

Kunming Institute of Zoology, CAS
Xiao-cai-Yuan, Kunming 650223, China
Tel: 086-0871-5140390
Fax: 086-0871-5151823

India

The G.B. Pant Institute for Himalayan Environment and Development (with units in Almora, Arunachal Pradesh, Sikkim and Himachal Pradesh)
Kosi-Katarmal, Almora- 263 643, U.P., India
Tel: (05962) 41411, 41414
Fax: (05962)22100
E-mail: gbpihed@shakti.ncst.ernet.in

The Wildlife Institute of India
P.O. Box # 18, Chandrabani, Dehradun 248 001, India
Tel: 640112 to 640115
Fax: 91-135-640117
E-mail: wii@iasdl01.vsnl.net.in

Pakistan

The World Wide Fund for Nature - Pakistan
All Institute of Education, Ferozepur Road
P.O. Box 5180, Lahore - 54600, Pakistan
Tel: 42-5862359-60, 5869429
Fax: 42-5862358-5811195

The World Conservation Union (IUCN)
Pakistan Country Office
1, Bath Island Road, Karachi - 75530
Tel: (+ + 92 21) 5861540, 5861541, 5861542
Fax: (+ + 92 21) 5870287
E-mail: amk@crq.khi.sdnpk.undp.org

Pakistan Science Foundation
Constitution Avenue G-5/2
Islamabad, Pakistan

Bhutan

The Royal Society for Protection of Nature (RSPN), Thimphu, Bhutan
Tel: 975-2-22056 and 23198
Fax: 975-2-23189

The World Wildlife Fund - Bhutan Programme
Box 210, Thimphu, Bhutan
Tel: (975) 2-23316 and 23528
Fax: (975) 2-23518
E-mail: wwf@bhutan.mos.com.np
(WWF Programmes are also operating in China, Nepal, India, and Pakistan)

National Environment Commission
P.O. Box 466, Thimphu, Bhutan
Tel: 975-2-23384 and 24323
Fax: 975-2-23385

Bangladesh

Unnayan Bikalper Niti-nirdharoni Gobeshona (UBINIG)
5/3 Barabo Mahanppur, Ring Road
Shymoli, Dhaka-1207, Bangladesh
Tel: 880-2-816420/811465/329620
Fax: 880-2-813065
E-mail: ubinig@citechco.net

The World Conservation Union (IUCN)
Bangladesh Country Office
76 Satmasjid Road, Dhaka - 1209,
Tel: 880-2-815061m 812931
Fax: 880-2815061
E-mail: iucnbd@citechco.net

Myanmar

Wildlife Conservation Society
Myanmar Programme Office
Bldg D-3, 2nd Fl (R), Aye Yeik on 1st Street
Yadanamon House Ave. Hlaing Township
Yangon, Union of Myanmar
Tel: 95-1-524893, Fax: 95-1-512838

Forest Resource Environment Development & Conservation Association (FREDA)
24, Yawmingyi Road, Dagon Township,
Yangon, Myanmar
Tel: 095-01-243827, 272500
Fax: 095-01-240377

Biodiversity on the Web

- Convention on Biological Diversity <http://www.biodiv.org> - A complete collection of material related to biodiversity and conservation, including official and unofficial documentation from the Secretariat to the Convention on Biological Diversity; miscellaneous case studies, declarations, laws, and statements related to traditional knowledge and biodiversity
- IUCN - The World Conservation Union <http://www.iucn.org/> - A union of 74 sovereign states, 105 government agencies, 699 non-government organizations, and 34 affiliates from 136 countries collaborating to provide a neutral forum for addressing conservation concerns at all levels. It draws its scientific and technical expertise from its technical programmes and an extensive global system of volunteer networks and commissions.
- Conservation International <http://www.conservation.org> - Has information on the most critically threatened areas of the world, the hotspots of biodiversity, developing approaches to conservation that produce tangible, lasting results
- The Indigenous People's Biodiversity Information Network (IBIN) <http://www.ibin.org/> - A rich source of information about experiences and projects to build capacities and increase collaboration among indigenous groups working on common causes related to biodiversity use and conservation.
- Biodiversity Servers <http://www.ecnc.nl/doc/servers/biodiver.html> - An exhaustive source of information on biodiversity, covering general introductions and overviews, species' diversity (flora & fauna), habitat diversity, landscape diversity, protected areas, biological and landscape diversity conservation, and with links to all related critical sites and general biodiversity servers.
- World Resources' Institute Biodiversity Page <http://www.wri.org/wri/biodiv/bri-home.html> - Contains facts and figures, on-line articles, the Global Biodiversity Strategy, photographs, and a glossary
- The Virtual Library of Ecology, Biodiversity, and the Environment <http://www.conbio.rice.edu/vl/> - An exhaustive list of links to information sources on ecology, biodiversity, and the environment.

All photographs used in the thematic of the Newsletter are contributed by Ajay Rastogi unless credited otherwise.

BOOK REVIEW

Conservation and Management of Biological Resources in the Himalaya

Edited by

P. S. Ramakrishnan, A. N. Purohit, K. G. Saxena,
K. S. Rao, and R. K. Maikhuri

This publication presents an overall picture of biological resources in the Himalayan region and beyond and discusses some conservation issues. It is a very impressive and informative volume on the Himalayas to the Eastern Himalayas to the Middle East region of Iran, from Sri Lanka and the Western Ghats of India to the lowland and highland Himalayas.

The papers in this volume are varied, in general, and for the Hindu Kush-Himalayan Region, in particular. There is a broad coverage of the issues of conservation and management of biodiversity resources in the Himalayas, from "conservation, planning and management of the biological diversity resources; surveying the existing flora and fauna diversity; and application of R/S" to "cultivation of medicinal plants of alpine zone for income generation; pollination by wild bee and insects; and ethnic community migration habits and creation of livestock hybrids to adapt natural climatic conditions." Emphasis is also given to the management of biosphere reserves and buffer zones. All this information are very useful.

It is interesting to note that the recommendation made in Chapter 36 "Conservation and Management of Biological Resources in the Himalaya - Issues and Priorities for Cross Sectoral and Cooperative Actions" for the preparation of a status report on the biodiversity of the Himalayas is already followed by ICIMOD (see the ICIMOD publication: "Banking on Biodiversity" 1996). Scientific research in the remote and high altitude areas on flora and fauna has to be prioritised. Ecology and biology of medicinal and other economically-important species should be researched and cultivation possibilities should be urgently explored. Application of R/S and GIS facilities for mapping, formation of databases, and monitoring of resources should be encouraged. Dynamics of crop diversity should be studied and solutions sought if diversity is endangered. Regional collaboration should be established through networking, transboundary conservation, capacity building, and exchange of knowledge bases and educational programmes. Management of biosphere reserves and natural protected areas should be incorporated with R & D activities and the results and findings should be extended.

1996. Publisher: Mohan Pramlani for Oxford & IBH Publishing Co. Ltd. New Delhi, 1996, 603pp.

Reviewed by -
Pei Shengji and Aung Kyaw Myint

Mountains 2000 and Beyond



"Experience from German assistance programmes has shown us that, above all, in these ecologically-valuable and also particularly sensitive mountainous regions, it is even more important than elsewhere that integrated development programmes be promoted rather than individual, isolated measures." H.E. Carl - Dieter Spranger, Federal Minister for Economic Cooperation & Development of Germany

In order to draw global attention and commitment to the problems and prospects faced by the 140 million people inhabiting the Hindu Kush-Himalayas, an 'International Conference on Sustainable Development of the HKH Region: Mountains 2000 and Beyond,' was organized amidst the lush hillside surroundings of Wildbad Kreuth, south of Munich, Germany, in June. The Conference was hosted by the German Foundation for Development and funded by the Governments of Germany and Switzerland on the occasion of 15 years of continuing support to ICIMOD.

Inauguration

In his inaugural address, Mr. Carl - Dieter Spranger, Federal Minister for Economic Cooperation & Development of Germany, said that he was delighted that eminent experts from South Asia and Europe, representing both the scientific community and the governments, had accepted invitations to participate in this important event taking place on the edge of the Alps. He hoped for fruitful exchange of problems and experiences and identification of strategies and solutions. He went on to reiterate the strong support of the German Government to UNCED Agenda 21, the Convention to Combat

Desertification and Chapter 13 of Agenda 21 dealing with Mountain Ecosystems. In closing, the Minister said that if we were to shape our future, good quality research and a long-term perspective that worked in terms of networks, promoted interdisciplinary discussions, and established an intensive dialogue between researchers and decision-makers were needed.

On the occasion, Dr. Hans Peter Maag, representative of the Swiss Agency for Development and Cooperation, read out a message from Ambassador Walter Fust, Director General, Swiss Agency for Development and Cooperation. Dr. Fust expressed his Government's satisfaction with 15 years of association with ICIMOD and emphasized ICIMOD's role in both policy research and advise and policy impact monitoring as well as promoting specific technical research networks among institutions in its member countries. Dr. Heinz Buhler, Director General of DSE, chaired the inaugural session.

Presentations

Following this, the Members of the ICIMOD Board of Governors, representing the Governments of the HKH countries, gave statements. The con-

tents of the conference were organized around the ongoing and planned activities of ICIMOD.

During the Conference, experts from ICIMOD presented papers on key thematic issues. The opening paper was presented by *Dr. Mahesh Banskota* on 'Transition of the Hindu Kush-Himalayas'. He outlined the changes experienced throughout the mountains in recent times and pointed out that the limited development efforts had had marginal impacts on poverty and the worsening environmental conditions. This was followed by presentations on the following: High Value Enterprises for Sustainable Livelihoods (*Dr. T.S. Papola*), Marginal Farms and Livelihoods of HKH Farmers (*Dr. Tej Partap*), Biodiversity Conservation in Mountain Development of the HKH Himalayas (*Prof. Pei Shengji*), Institutional Innovations for Sustainable Management of Common Property Resources in the HKH (*Anupam Bhatia*), Mountain Hazard Mitigation and Risk Engineering in the HKH Region (*Prof. Li Tianchi*), Gender-Balanced Development in the Mountains of the HKH (*Jeannette D. Gurung*), Use of GIS in Mountain Development Planning and Monitoring (*Pramod Pradhan and Peter Bitter*), Communicating for Devel-

opment (*Shahid Akhtar*). Finally, highlights of ICIMOD's programme for the next four years were presented by *Egbert Pelinck*. He stated that, in view of the success with the first RCP, ICIMOD had developed the Second RCP (1999 - 2002) focussing on the five major programmatic areas of poverty reduction, the mountain commons, gender, capacity building and outreach. The Programme aimed to mobilise 40 million dollars, of which 60 per cent was expected as unrestricted funds and the remaining was envisaged for specific projects.

The presentations were chaired by prominent mountain development scholars, namely, *Prof. Winfried von Urff*, *Prof. Skidmore*, *Dr. Klaus Lampe*, *Mr. T. Wachs*, *Dr. Lynn Bennett*, and *Dr. Hans Peter Maag*. Inputs were provided by scientists from Europe and the Members of the Board of Governors.

Discussions

Discussions on the themes on different aspects of sustainable mountain development introduced by ICIMOD, and specifically the highlights of its Second Regional Collaborative programme (1999 - 2002), took place both in plenary and in smaller working groups. Issues were raised on the following topics.

- A comprehensive vision for mountain areas* - there should be a comprehensive vision that provides a basis for future action for all concerned.
- A framework for examining poverty and sustainable livelihoods* - A comprehensive and systematic conceptual framework linking the ecological, economic, and social components of poverty and sustainable livelihood needs to be developed.
- Interaction with different stakeholders* - Although there was some recognition of the role of different stakeholders, the role of some of the groups needs further emphasis (teachers, mountain academics, projects in the mountains).
- Emphasis on Communications with Policy-makers* - The Centre must focus on interacting with intermediaries and one of the most critical groups is the policy makers. In most cases, direct communications at the grass roots will be a difficult area for the Centre.

- ICIMOD's global responsibility* - Better communications and interactions than in the past with different mountain regions of the world are needed.
- Links with Industry* - Greater participation of the industrial sector in sustainable mountain development, given the increasing role of the private sector, needs to be facilitated.
- Standardisation and Reliability of Data* - Apart from the support promoting advanced geo-informatic technology, emphasis should also be given to determining the reliability and standardisation of data that are being fed into these systems.

Conclusions

The meeting provided a unique opportunity to reflect on the larger issues of sustainable mountain development, in general, and on ICIMOD's role, in particular. In addition to the points described in the previous paragraph, the following conclusions can be drawn.

- RCP-II* - The planning, monitoring, and evaluation (PME) process needs strengthening within the Centre and both qualitative and quantitative indicators for monitoring and evaluation are needed.
- Strategic Alliances* - Many of the research and teaching institutions present expressed a keen interest in continuing interaction with ICIMOD. The Centre could develop more effective networks with institutions outside the region and benefit from their knowledge/expertise for specific contributions not available in the HKH.
- Financial support to RCP-II* - The representatives of the governments of Germany, The Netherlands, and

Switzerland indicated their organizations' interest in supporting ICIMOD.

The Conference was an important forum that will gear ICIMOD's programme to meet the challenges of mountain development for the next millennium.

Field Excursion

Following the meeting in Germany, a field trip to Switzerland was organized by the Swiss Government. The excursion provided the group first-hand knowledge about the mountain development challenges and successes encountered by the Swiss through on-site visits, presentations, and discussions. The places visited were the Agricultural Training Centre (challenges to Swiss mountain agriculture), Brienz (erosion control measures); Kleiner Rügen Forest (crucial points in the development of Switzerland, regional policy, specific power-sharing instruments for mountain area development); Grindelwald (tourism, alpine agriculture, land-use changes); Gersteneegg (development of energy resources and impacts of liberalisation); and Susten to Wassen (transalpine traffic, air pollution, forest protection, global warming). Through this Newsletter, ICIMOD would like to acknowledge the inputs provided by the following resource persons during the field trip: *Heini Burri*, *Ueli Ryter*, *Heinz Pfiffner*, *Dr. Simon Huber*, *Walter Jauch*, *Christian Kuchli*, *Dr. Paul Messerli*, *Max Ursin*, and *Urs Zurcher*.

Special thanks are due to *Christian Kuchli* for organizing the visit to various mountain sites and to *Dr. H. P. Maag* of SDC for taking the initiative of inviting the participants to the field trip and for facilitating it.



With the objective of providing a mountain development forum and strengthening local and national institutions, ICIMOD organizes many workshops, seminars, and training courses on wide-ranging issues pertaining to mountain development. It is not possible to report on all of these, but selected ones have been profiled below.

A Regional Training Course on Recent Concepts, Knowledge, Practices, and New Skills in Participatory Watershed Management

was organized from April 3-10, for the Participatory Watershed Management Training in Asia (PWMTA) Programme of FAO/Netherlands. Thirty-one professionals (12 women and 19 men) from institutions involved in Watershed Management (WM) and Natural Resource Management (NRM) in 9 countries participated in the training. The participation of women professionals was a record for PWMTA training courses organized so far. Twenty-two resource persons from ICIMOD, HMG/Nepal, NGOs, and PWMTA/FAO were involved in this training. The subjects covered included an overview of recent concepts and participatory processes, economies of big versus small self-help WM projects, bio-engineering methods for gully and landslide stabilisation, water harvesting and land rehabilitation, integrated nutrient management and bio-technologies for WM, conflict resolution in forestry/WM programmes, environmental impact/strategic environmental assessment, GPS/GIS/Remote Sensing (3S) techniques, etc. These subjects were divided into three modules in the draft training manual prepared by ICIMOD which was distributed to the trainees in advance. The manual was reviewed by the participants and is now being finalised by the Mountain Natural Resources' Division for publication jointly with PWMTA/FAO/Netherlands.

Two days were devoted to field trips to ICIMOD's watershed management project site in Jhikhu Khola and

ICIMOD's demonstration complex at Godavari. The training was the last of three training courses organized by ICIMOD for PWMTA. (*Training Coordinators: S.R. Chalise and B.R. Bhatta*)

The **Regional Advisory Committee on Water Harvesting** is comprised of senior experts/officials from leading government organizations, academic bodies, NGOs, and individuals from China, India, Nepal, and Pakistan. The Committee met on, April 16. The day-long discussion on Water Harvesting Management Systems in the HKH finalised draft outlines for case studies and country reviews on policies/programmes and institutions on water harvesting and management systems to be undertaken during 1998 in Bhutan, China, India, Nepal, and Pakistan.

The **First Meeting of the Steering Committee of the Hindu Kush-Himalayan Flow Regimes from International Experimental and Network Data (HKH-FRIEND)** was organized jointly by UNESCO/IHP and ICIMOD in cooperation with the German IHP/OHP and was held at the ICIMOD Conference Hall, Kathmandu, Nepal, from May 11-12, 1998. It was attended by official nominees and observers from the countries of the HKH region and representatives from UNESCO/IHP, WMO, the German National IHP/OHP Committee, Global Runoff Data Centre (GRDC), Germany, the Institute of Hydrology, UK, and ICIMOD.

The Steering Committee unanimously elected Mr *Kiran Shankar Yogacharya* (Nepal) *Chairman* of the HKH-FRIEND for the next two years and *Prof. S. R.*

Chalise as the *Executive Secretary* for a term of three years.

The meeting identified the following six project areas for the HKH-FRIEND: a) Database; b) Floods; c) Low Flow; d) Rainfall-Runoff; e) River Water Quality; and f) Snow and Glaciers.

The collaborating institutions, viz, the German IHP/OHP Committee, GRDC, and the Institute of Hydrology, UK, expressed their willingness to provide financial and/or technical support for various project activities and also to assist in getting funds from donor agencies.

It was decided that the secretariat for the HKH-FRIEND will be provided by ICIMOD and the Regional Database Centre (RDC) will also be located at ICIMOD for the time being. Draft policy guidelines for the RDC will be prepared by the end of 1998 for the consideration of the steering committee.

The next meeting of the HKH-FRIEND steering committee will be held in Pakistan and Pakistan Council for Research in Water Resources is to pro-

Member of the Regional Advisory Committee on Water Harvesting

Professor Liu Changming, Academician, Chinese Academy of Sciences; Dr. J.S. Samra, Director, Central Soil and Water Conservation Research & Training Institute, and Dr. Lalit Pande (NGO), India; Dr. D.N. Dhungel and Dr. Prachanda Pradhan - Nepal; Dr. Zafar Altaf, Chairman, Pakistan Agricultural Research Council, and Mr. Stephen F. Rasmussen, General Manager, AKRSP- Pakistan; Dr. Ujjwal Pradhan, Ford Foundation; and Dr. Mahesh Banskota, Dr. N. S. Jodha, Prof. Li Tianchi, Prof. S.R. Chalise, and Mr. Saleem A. Sial from ICIMOD.



vide organizational and local support.

An **Introduction to Database Management on Water Resources** - a regional training course - was organized at ICIMOD from 13-22 May. Technical and financial support was given by GRDC, the German IHP/OHP Committee of the Federal Institute of Hydrology, Germany, UNESCO/IHP, and ICIMOD. It was the first technical activity of the HKH-FRIEND and 12 participants from relevant institutions in Bangladesh, China, India, Nepal, and Pakistan took part in it. Dr. W. Grabs, Head, GRDC, and Mr. J. Pauler of GRDC were the principal instructors.

The first regional training in **Application of GIS and RS to Assessment, Monitoring, and Management of Mountain Natural Resources** was held at MENRIS, ICIMOD, from June 15 to July 10. Sixteen professionals from the region, nine out of them women, participated in this practical course. The course was coordinated by Dr. Moe Myint. The training focussed mainly on the basics of geo-information technology and its application to mountain natural resources, especially biodiversity. The training was for four weeks and was rounded off with practical work in the Shivapuri watershed.

In June, a two-day seminar on **Research Findings of the People and Resource Dynamics Project** (PARDYP) was organized in Dhulikhel, Kabhrepalanchok District, in collaboration with the District Development Committee (DDC), the UNDP Participatory District Development Programme, and HMG/N line agencies participating in the project activities. The main objective of the workshop was to present research findings from the past 6-7 years' work in the Jhikhu Khola Watershed to the Village Development Committee chairpersons.

Participants expressed the opinion that research activities should be based on farmers' needs and must have a broad framework to accommodate issues of relevance to farmers. The participants emphasised the need to translate research findings into development activities involving farmers through appreciative enquiry and participatory approaches. Information generated to date was broadened the understanding of the biophysical system, but the potential role of research for development activities has to be emphasised and research should not be carried out just for its own sake.

The DDC Chairman, Mr. K. P. Sapkota, suggested that ICIMOD should help the DDC to prepare proposals for development to submit to donor agencies and that the Centre should organize a workshop to facilitate funding. ICIMOD/PARDYP activities must focus on translating research into development programmes and should have an open-door policy for other donors to participate. The role of research for integrated district development was emphasized.

Regional Workshop on **Participatory Forest Management: Implications for Policy and Human Resource Development in the Hindu Kush-Himalayas** was organized jointly by the South West Forestry College (SWFC), Kunming, and ICIMOD from May 7-12, 1998, in Kunming, China. Seventy-five participants from seven Regional Member Countries and representatives from GTZ, Nepal-UK Forestry, Nepal-Australia Forestry, and Ford Foundation attended the workshop.

This was the second one in the series of Hindu Kush-Himalayan Forum for Forest Conservation and Management (HIFCOM) workshops. As part of ICIMOD's Participatory Natural Resource Management efforts in facilitating emergence of new institutions, this workshop formalised HIFCOM as an

independent and self-sustaining organization. HIFCOM is a network of senior forestry professionals, initially from Nepal and India, and as of this workshop, from Pakistan, Bhutan, Bangladesh, Myanmar, and China. The workshop realised the objective of sharing the national and sub-national studies that were carried out under the aegis of senior policy-makers. Eleven papers were presented on the basis of the country studies commissioned on the state of forestry in different countries.

There was a field visit to an ethnic minority village, mostly for non-Chinese participants, and a film show on 'Forest Managers of the HKH' with subtitles in Chinese. The Chinese translation of an ICIMOD publication 'Community Forestry: The Language of Life' was released at the workshop.

Professor Yang Fucheng, President of SWFC, chaired the entire workshop and expressed his support to the HIFCOM initiative. He said that for the sustainable management of forests, all aspects of forestry need to be developed. HIFCOM appointed a Chair and Secretariat for the following year.

In August, a month-long **Training Course on the Application of GIS and Remote Sensing to Location Planning for Basic Infrastructure and Services** was jointly organized by the Local Government Engineering Department and ICIMOD in Bangladesh. Minister for the Chittagong Hill Tracts' Affairs, Kalpa Ranjan Chakma, inaugurated the training and said "GIS has emerged as an effective technology because it allows geographers to integrate their data and methods in ways that support traditional forms of geographic analysis, such as map overlay and modeling that are beyond the range of manual methods." There were altogether 16 participants attending the training course, and among these six were women.

INFORMATION SOUGHT

ICIMOD is to compile an annotated bibliography of practical, 'how to' handbooks, manuals, guidebooks, etc focussing on topics related to social and sustainable development - such as use of appropriate and environmentally-friendly technologies, alternative energy sources, latrine and rural roads construction, water management, and appropriate farming systems. The bibliography will contain materials from all sources and regions, but will emphasize the Hindu Kush-Himalayan region. It will also contain a section on materials available in the vernacular.

It is planned to bring out the bibliography in the new year. We seek your cooperation and support and request you to contact us if you have produced any materials on these topics in the past six years and send us copies of these for possible inclusion in the bibliography. Anyone having entries in the bibliography will receive one copy free.

Please send these materials to Sangeeta Pandey at ICIMOD at your earliest convenience.
(e-mail: sangeeta@icimod.org.np)

ICIMOD adopts a decentralized approach to programme implementation, functions as a facilitator for access to knowledge and advice, and provides a regional perspective to national and local activities. In this respect, the staff of ICIMOD are required to make frequent visits to the eight ICIMOD member countries. In addition, international travel is undertaken occasionally to maintain global linkages. It is not possible to give an account of every visit. Nevertheless, brief accounts of most regional and international visits are provided in this section.

REGIONAL LINKAGES

BANGLADESH

Mr. Basanta Shrestha and Mr. Iftikhar U. Sikder visited Dhaka from 26 April - 1 May to prepare for the first National Workshop on Locational and Infrastructure Planning to be held in Bangladesh in August (2-27) this year. They identified the possible collaborating institutions working with a similar discipline and mandate. Relevant case studies, experiences, and possible logistic input from the Local Government Engineering Department (LGED) and other institutions in Bangladesh have been explored. Moreover, a framework was developed for preparation of a Bangladesh GIS Database - to be jointly published by ICIMOD and LGED.

BHUTAN

Mr. Shahid Akhtar visited Thimphu from 27 April to 2 May to discuss the establishment of a Bhutan Intranet Project and establish linkages with the Electronic Networking Project based at ICIMOD, Kathmandu, and to meet present and potential ICIMOD partner institutions to discuss mutual cooperation. During his visit, he met the Deputy Minister of Communications - Dasho Leki Dorji, Deputy Minister of the National Environment Commission - Dasho Paljor J. Dorji, and also the Deputy Minister of Agriculture - Dasho Kinzang Dorji, and other personnel and discussed possible collaboration and cooperation between ICIMOD and their respective organizations/institutions.

Mr. Richard Allen also visited Thimphu from May 25 to June 11. The purpose of the visit was to begin preparations with the *Dunkar Drukpa* for a joint presentation at the MENRIS workshop to be held in November, and to contact relevant Bhutanese collaborators for the ICIMOD projects/programmes, e.g., Sustainable Water Harvesting, Landslide Hazard Management and Control, Land Policies Management and Degradation, and HKH-FRIEND. In this connection, Mr. Allen met senior executives

of the Extension and Irrigation Division, MoA; Hydrology Unit; Division of Power, Ministry of Trade and Industry; Public Works' Division, Ministry of Communications; and the Renewable Natural Resources' Research Centre.

CHINA

In March, Dr. Junejo visited Hangzhou to participate in the coordinating committee meeting of the International Network on Small Hydropower. The conference discussed the international investment and financing of small hydropower plants; operation, maintenance, and rehabilitation; and economic/technical cooperation - including joint ventures.

INDIA

Dr. T. S. Papola and Dr. Kamal Rijal visited Uttarakhand and New Delhi to explore the possibility of cooperation with organizations in the field of micro-enterprises and energy besides monitoring activities initiated in Uttarakhand. During the visit the two professionals met executives/personnel of the U.P. Academy of Administration (UPAA), Nainital; G. B. Pant Institute of Himalayan Environment and Development; Himalayan Environmental Studies and Conservation Organization, Gawahar-Chowki Chamoli District; H.N.B. Garhwal University, Srinagar; Academy of Mountain Environics (AME), Dehradun; and the Tata Energy Research Institute, New Delhi, and discussed possibilities of and avenues for collaboration between ICIMOD and them. Dr. Papola and Dr. Rijal also made trips to Bhimtal and Naukuchyatal; the Micro-Hydropower station in Almora; and the PARDYP site in Almora.

Similarly Prof. Li Tianchi visited Almora from 16-26 March to support and facilitate the Mountain Risk Engineering (MRE) project activities being implemented by the G.B. Pant Institute for Himalayan Environment and Development. Prof. Li assisted the MRE team in

selecting instabilities and in planning and designing measures to control the selected instabilities using small-scale civil and bio-engineering techniques.

Dr. Tej Partap visited Palampur and Itanagar from 14 - 30 May to discuss ICIMOD's participation in the forthcoming International Symposium on Mountain Agriculture at Himachal Agricultural University - Palampur. He also delivered a lecture on 'Institutional Challenges in Widening Research Agenda to Combine Mountain Agricultural Development with Natural Resource Management' at the University. ICIMOD is providing the financial support to organize the international symposium as well as sponsoring participation from the HKH countries. Dr. Partap also participated in a workshop on 'R&D Planning for the North-East Indian Himalayan Region' organized by the GB Pant Institute of Himalayan Environment and Development where he presented a paper 'Combining Hill Agricultural Development with Natural Resource Management: Institutional Challenges for the North East Indian Himalayas'.

From 27 April to 5 May, Dr. N.S. Jodha participated in a meeting in New Delhi organized by the 'Biodiversity Conservation Prioritisation Project' to assess its work and impact. He also had discussions with Ford Foundation officials on the first progress report of ICIMOD's policy project and the possibility of a second phase. The progress report was well received by the Foundation. ICIMOD was requested to submit a proposal for a second phase in the 3rd quarter of 1998. Dr. Jodha also attended a planning meeting on the 'Establishment of an Environmental Economics' Network for South Asia' in Bombay.

Prof. Pei Shengji and Mr. Ajay Rastogi participated in the 'International Conference on Medicinal Plants Conservation, Utilisation, Trade and Cultural Traditions' in Bangalore. They also helped organize a session on Himalayan Me-

dicinal Plants and presented papers at the session.

Mr. Shahid Akhtar and Ms. Jeannette Gurung visited the Women's Feature Services in New Delhi to discuss the development of a proposal for a joint ICIMOD/WFS project on 'En-gendering Policies for Mountain Women in the HKH Region'. The joint preparation is to be completed shortly.

Mr. Aung Kyaw Myint participated in the FAO-GOI Regional Workshop on 'The Status of Forest Resources Assessment in the South Asia Sub-region and Country Capacity Building Needs', held in Dehra Dun from 8 -12 June. He presented a paper on 'Forest Resources of the HKH'. It was agreed that a regional network for the CCB would be established and that ICIMOD would also be included in the network.

Dr. Pitamber Sharma accompanied by *Dr. Pradeep Tulachan* visited Srinagar, Badrinath, and Nainital from 16-25 June to participate in the National Seminar on 'Environmental Changes and Sustainable Development in the 21st Century: Uttarakhand Himalayan Perspective' organized by H.N.B. University, Srinagar, Garhwal, with the support of a number of national institutions and ICIMOD. Dr. Sharma had the honour of inaugurating the seminar as chief guest, and he also delivered a guest lecture on 'Environmental Change and Sustainable Development'. He highlighted the relevance of ICIMOD's work to Uttarakhand which was poised on the threshold of Statehood.

Mr. Pramod Pradhan, Dr. Moe Myint, and Mr. Peter Bitter provided guest lectures and demonstrations at a **Post-Graduate Course on GIS and Remote Sensing**, run by the Centre for Space Science and Technology Education in Asia and the Pacific at the Indian Institute of Remote Sensing in Dehra Dun. They also consulted the Wadiya Institute of Himalayan Geology, and the Forest Survey of India on collaboration.

MYANMAR

Ms. Jeannett Gurung visited Yezin from 18-23 May, primarily to provide follow-up assistance to the participants who had attended the Gender and Organizational Development Training held in 1997. Ms. Gurung also met high-level officials from the Agricultural Research

Institute (ARI), Department of Forests, Department of Agricultural Planning, and Ministry of Agriculture and Irrigation and held discussions on gender and development programmes. She also investigated the possibility of adding the ARI to the network of partner institutions.

NEPAL

Dr. Kamal Rijal and Mr. Rajan Thapa visited the Yarsha Khola - PARDYP Project site - to explore the possibility of introducing energy sector activities there. They visited different sites and institutions in different Village Development Committees of Kabhre District and familiarised themselves with the energy situation in of the watershed area.

In May, *Dr. Kamal Rijal* accompanied *Dr. P. Phartiyal* - Programme Manager, Centre for Development Studies, UPAA, Nainital, and *Mr. D. P. Dobhal* - Engineer, HESCO, Chamoli, in carrying out a socioeconomic survey of traditional water mills carried out by the Centre for Rural Technology in Melamchi, Sindhupalchowk. They learned that improved water mill technology, which has the potential to increase the agro-processing capacity, was well suited to the needs of the local community.

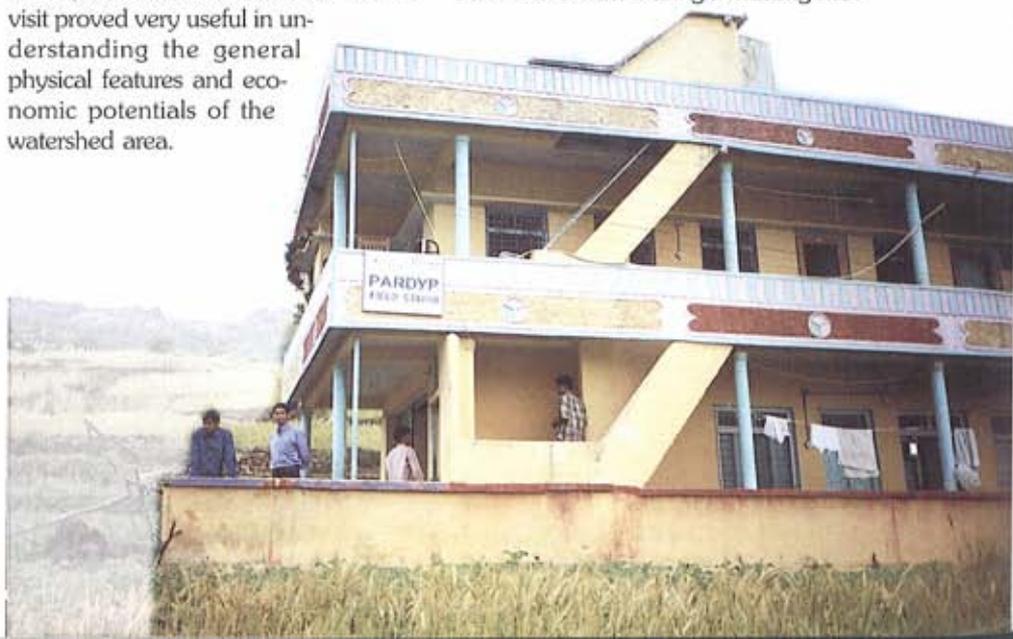
Dr. T. S. Papola, Dr. P. Sharma, Dr. K. Rijal, Dr. A.A. Junejo and Mr. P. B. Shah visited Yarsha Khola Watershed - the Nepal PARDYP Project Site - to explore the potential for introducing infrastructure and enterprise-related activities. The team had meetings with officials of the TUKI Association, Field Office of Nepal Electricity Authority, Agricultural Development Bank, Dolakha District Office, Office of the District Development Committee, and the District Forest Office. The visit proved very useful in understanding the general physical features and economic potentials of the watershed area.

PAKISTAN

In April, *Dr. A. A. Junejo* visited the Aga Khan Rural Support Programme (AKRSP) in Chitral to oversee the training of the MHP Operators and Managers sponsored by ICIMOD. Dr. Junejo also visited MMHP installations in the Valley of Chitral. Additional training for managers and operators was requested by the AKRSP, and it was asked to submit a written request with a plan and budget.

Dr. Tang Ya visited the Northern Areas, Muree and Bagga, and Shahadara to select a new site for the Appropriate Technologies for Soil Conserving Farming Systems' (ATSCFS) Project, to discuss the implementation arrangements, and sign an implementation agreement with the national collaborating institutions (NCIs). Dr. Tang Ya also met Dr. Zafar Altaf, Chairman of the ICIMOD Board of Governors, and Dr. Mohammad Akbar, Director of the National Agricultural Research Council, and discussed the selection of ASTCFS project sites. One observation made was that both physical and social considerations had to be taken into account in planning interventions in these areas.

Ms. Phuntshok Tshering travelled to Muzafarabad, NWFP, and Balochistan to visit partner institutions; meet participants from the training on Gender and Organizational Development for Sustainable Mountain Land Use in the HKH Region, held in 1997; and to identify candidates from within the same institutions for the next training. She was gratified to see first-hand the application of the training. Ms. Tshering met with Officials of Pakistan Forestry Institute (PFI) where she was briefed about the PFI activities. During a meeting with



MAINTAINING GLOBAL LINKAGES

senior officials from the Muzafarabad State, Ms. Tshering had opportunity to discuss women and gender-related activities. Ms. Tshering also travelled to Solan and Tehri Garhwal in India for the same purpose.

In June, Mr. Richard Allen travelled to Peshawar, Mahshera, and Islamabad where he evaluated PARDYP's progress and established contact with individuals and organizations in northern Pakistan to assist the Pakistan Forestry Institute (PFI) to carry out project activities. He also finalised the 1998 work plan and delivered computers, a camera, and project reports and brochures to PFI.

From 17-27 April, Mr. Saleem A. Sial travelled to Lahore - primarily to identify institutions and persons to undertake case studies on local water harvesting technologies and management systems in micro-watersheds of the HKH and to explore possibilities of networking with the Water and Power Development Authority (WAPDA). During the visit, Mr. Sial met high-level officials from different organizations such as the On-far Water Management Department, Punjab; Pakistan Council of Research in Water Resources, Islamabad; Planning Commission of Pakistan; and National Aridland Development and Research Institute, PARC. He exchanged information regarding water harvesting programmes and technologies and discussed possible collaboration with ICIMOD in its water-related activities. The reactions were very positive.

EUROPE - In May this year, Mr. Egbert Pelinck visited the Netherlands, Germany, Finland, Switzerland, Austria, Sweden, Norway, and Denmark - primarily to brief several core and project donors on various matters related to their support to ICIMOD, including ICIMOD's Second Regional Collaborative Programme (RCP-II). He also explored opportunities for future funding for RCP-II. The visit proved to be very timely and useful, RCP-II was well appreciated, and the initial response was encouraging and supportive.

ETHIOPIA - Dr. Tej Partap and Dr. Pradeep Tulachan visited Addis Ababa in May. They participated in a 'Planning Workshop on Agroecosystems and Human Health' organized by the International Livestock Research Institute (ILRI) and discussed the possibility of organizing a similar workshop in the HKH. The need for joint development of a systematic database on livestock production systems in the HKH was recognised. Discussions about documenting the state-of-the-art on 'Livestock in Mountain Agricultural Systems of the HKH Region' were held.

KYRGZISTAN - From the 23-29 May, Mr. Shahid Akhtar and Kishor Pradhan participated in a seminar on 'Mountains of Central Asia: Problems, Experiences, and Perspectives' organized in Bishkek by the International University of

Kyrgyzstan with support from ICIMOD. The meeting brought mountain specialists from the whole of Central Asia together to exchange information and experiences on a broad range of subjects for the first time in six years. While in Bishkek, they visited the Institute of Rock Physics and Mechanics, Machinery Research Institute, and the Institute of Seismology.

PHILIPPINES - Mr. Shahid Akhtar participated in the 'Asia Pacific Mountain Network' (APMN) Forum for Sustainable Mountain Development' held at the College of Forestry, University of the Philippines, Los Banos, in March. Eleven state-of-the-art papers were presented. Experiences in global and regional networking, i.e., APMN/Mountain Forum and the Agroforestry Network were discussed and their relevance to the advancement of sustainable mountain development in the Philippines and in Southeast Asia. The main output of the forum was development of the R&D agenda based on the problems and issues confronting mountain ecosystems as identified by the speakers and participants. Problems focussed on issues peculiar to mountains on islands, as distinguished from continental mountains. During the visit, Mr. Akhtar also had meetings with Robert Huggan, Senior Adviser, External Operations, and Gene Hettel, Head of



On the occasion of World Environment Day, 5 June 1998, ICIMOD participated in an exhibition on environment in Nepal. Prime Minister, G.P. Koirala visited the ICIMOD stall and expressed HMG Nepal's appreciation for ICIMOD's work in the country. Also seen on the photograph are Mr. Purna Bahadur Khadga, Minister for Youth, Sports and Culture, and Mr. V.P. Shrestha - the ICIMOD Board Member representing Nepal.

Communication and Publication of IRRI regarding mutual cooperation.

THE NETHERLANDS - In April, Dr. Tej Partap travelled to the Hague to participate in a workshop organized by ISNAR to look at the progress of work from four current projects and provide a platform to several other institutions submitting new project proposals. The ICIMOD proposal on 'An Ecoregional Framework for Assessing Sustainable Agricultural Systems in the HKH' is presently being reviewed.

THAILAND - In March, Mr. Sushil Pandey travelled to Bangkok to participate in the UNEPnet/Mercure web development programme for Mercure sites from the Indian ocean region hosted by the Environment Assessment Programme - Asia Pacific (EAP-AP) of-

fice at the Asian Institute of Technology. The programme was conducted by staff of UNEP, Nairobi, and the UNEPnet Implementation Centre, Norway.

CANADA - Dr. N. S. Jodha travelled to Vancouver from 8 to 18 June. He participated in the 'Seventh Annual Conference of the International Association for Study of Common Property Resources' and the Meeting of the Steering Group for CGIAR's inter-centre initiative on property rights and collective action coordinated by the International Food Policy Research Institute, Washington D.C., and held at the University of British Columbia. Dr. Jodha also presented a paper on 'Devolution: Re-empowerment of Communities.' Dr. Jodha observed that communication tools such as Email, Internet, and also

ICIMOD's publications have introduced ICIMOD's work to the international community. He also met representatives of different donor agencies, e.g., Ford Foundation, IDRC, and CGIAR.

USA - Mr. Ajay Rastogi visited Virginia from May 6- June 19. He undertook SI/MAB training in measuring, assessing, and monitoring biodiversity. This programme has established a worldwide network of 297 permanent plots of 50 hectares and one hectare size classes. There is now over a decade's experience in establishing these plots and developing the tools for multi taxa monitoring programmes. The five-week international training programme was organized at the Conservation Research and Training Centre of the Smithsonian Institute in Virginia.

Pollination using honeybees



Polliniser graft



Hand pollination



Bouquet pollination



Studies on Pollination Problems in Mountain Crops and Farmers' Management Strategies

Apples are the leading cash crop in mountain areas of the Hindu Kush-Himalayan region. They are grown in the hilly and mountain areas of the Indian Himalayas, Pakistan, China, western Nepal, and Bhutan. However, over the past few years, both apple productivity and quality are declining despite agronomic inputs. Farmers estimate that, during the past seven to eight years, the productivity has declined by 50 per cent. Inadequate pollination is likely to be one of the main reasons.

ICIMOD recently instituted two studies; one in Himachal Pradesh, India, and another in Maoxian County, China, to examine the reasons for pollination failures and assess the scale of the problem. Preliminary information obtained through these studies revealed that lack of appropriate polliniser proportion, scarcity of insect pollinators, and adverse climatic factors are the main factors causing pollination failures in apple crops in Himachal Pradesh. The information derived also shows that apple farmers have developed certain strategies, such as using flower bouquets and hiring honeybee colonies, manager pollination. Farmers also smoke or spray the orchards with clean water to increase the temperature in the orchard. In Maoxian County farmers have been carrying out hand pollination of each and every flower in their apple orchards for several years. A massive community-level exercise was undertaken in April.

We would like to request individuals and institutions to share information with us on this subject, i.e., pollination problems and farmers' strategies to manage pollination of apples or other cash crops in other areas of the HKH. Please write to:

Beekeeping Project, ICIMOD, P.O. Box 3226, Kathmandu, Nepal

ISSN 1024-7556

Integrating Geomatics and Participatory Techniques for Community Forest Management. Mountain Natural Resources Discussion Paper 98/2. Kathmandu: ICIMOD. 1998. 47p.



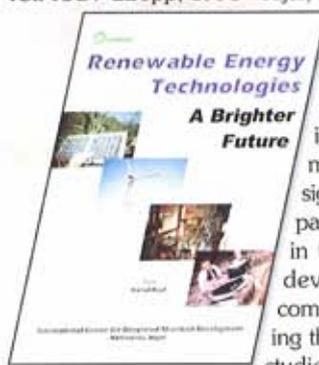
-Gavin H. Jordan, Bhuban Shrestha, Price: US\$ 15.000

There is a growing need for forest resource information in community forestry to provide baseline data enabling changes in the resource to be assessed. Traditional methods of forest resource assessment are not appropriate for community forestry owing to the time and expense involved and their focus on timber production. This paper

shows how recent geomatics' technology can be used in conjunction with participatory techniques to provide a framework for low cost, appropriate technology forest resource assessment. The role and value of a variety of different approaches are evaluated by using case studies as examples.

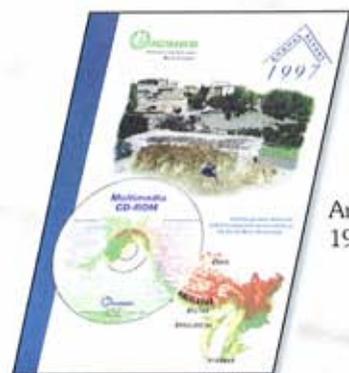
ISBN 92-9115-791-0

Renewable Energy Technologies: A Brighter Future. Kathmandu: ICIMOD. 220pp, 1998 - Rijal, K. Ed. Price: US\$ 20.00



This document reviews renewable energy policies for mountain areas of China, India, Nepal, and Pakistan and highlights the important findings. The document argues that technology design compatible to local conditions, participation of the private sector in the development of RETs, and devices affordable by mountain communities are critical for improving their financial viability. Four case studies are discussed, namely, Mini-

and Micro-hydropower, Solar Photovoltaic Technology, Biogas, and Improved Cooking Stoves. These case studies were carried out in Nepal. Through them various issues pertaining to these RETs are identified. The document proposes a framework for policy recommendations to promote the development of renewable energy resources and technologies and provides broad policy guidelines not only for Nepal but also for the Hindu Kush-Himalayan Region. Finally, the document proposes an agenda for policies and action to promote RETs in Nepal, in addition to proposing technology-specific measures.

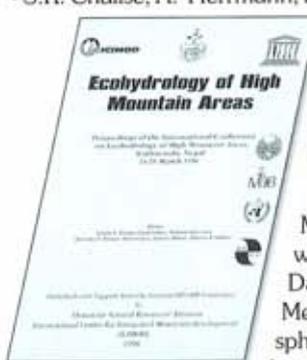


Annual Report 1997

ISBN 92-9115-726-0

Ecohydrology of High Mountain Areas: Proceedings of the International Conference on Ecohydrology of High Mountain Areas. Kathmandu, Nepal, 24-28 March 1996. 680pp, 1998

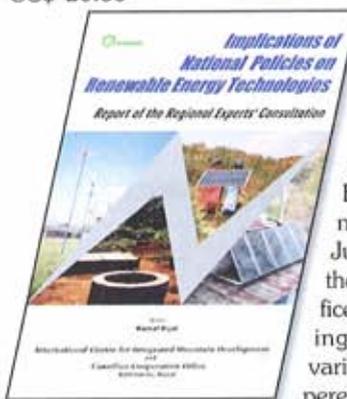
-S.R. Chalise, A. Herrmann, N. R. Khanal, H. Lang, L. Molnar, A.P. Pokhrel. Price: US\$ 40.00



This document contains papers presented at a unique workshop on 'Ecohydrology of High Mountain Areas'. Papers are divided into six topic areas namely: Regional Issues on High Mountain Ecohydrology; Network Design, Instrumentation, Data Collection and Processing Methodology and Modelling; Atmospheric, Hydrologic and Ecological Interaction; Role of Permafrost, Glaciers, and Snow Cover; Dynamics and Hazards of Erosion and Sedimentation, Ecosystems of High Mountain Areas and Landscape Processes; and Water Quality and Limnological Issues. Most of the papers have individual abstracts. A volume of abstracts published prior to the conference is also available.

ISBN 92-9115-807-0

Implications of National Policies on Renewable Energy Technologies. Kathmandu, ICIMOD. 60pp Rijal, K. Ed. Price US\$ 20.00



This report summarises the discussions held and recommendations made at the Regional Experts' Consultation on Implications of National Policies on Renewable Energy Technologies organized by ICIMOD from 2-3 July 1997 with support from the Canadian Cooperation Office in Kathmandu. The meeting reviewed and discussed various policies that had hampered the sustainable growth of

RETs in the mountain communities of the HKH region with particular reference to China, India, Nepal, and Pakistan. The meeting proposed a framework for policy recommendations to promote the development of RETs and discussed four case studies carried out in Nepal. The meeting also charted out policy and institutional measures suitable for Nepal.

Issues in Mountain Development - ICIMOD Briefs

- IMD 98/1 - Poverty- Environmental Resource Degradation Links: Questioning the Basic Premises
Dr. Narpat Singh Jodha
- IMD 98/2 - Intellectual, Biological, and Cultural Property Rights in the HKH - *Ajay Rastogi*
- IMD 98/3 - Environment, Culture, Economy, and Tourism: Dilemmas in the Hindu Kush-Himalayas
Dr. Pitamber Sharma

Electronic Networking for Sustainable Mountain Development and NepalNet

ICIMOD's Electronic Networking for Sustainable Mountain Development project is an electronic network of 30 Nepalese organizations. The objective of the network is to share information on the Internet. Funded by the International Development and Research Centre (IDRC), Canada, this project will launch its website, *NepalNet*, on 15 September 1998. (<http://dits.icimod.np.nepalnet>)

With the aim of becoming the one stop destination on sustainable development information on Nepal, NepalNet features information on nine Key Development Sectors, i.e.: Agriculture; Ecology & Biodiversity; Forestry; Economics & Employment; Education; Sociology and Demography; Policy and Law; Technology and Infrastructure; Water, Earth and Atmosphere. It also contains organizational profiles of the 30 organizations that collaborate in the construction of the site. They include academic and research institutions as well as government and non government organizations throughout Nepal. This list is expanding as other organizations continue to join the network.

Nepal Font Standardisation

In April, ICIMOD participated in IDRC's Pan Asia Research & Development Grants Committee, which it is a member of through the Head of Documentation, Information and Training (DITS). Several project proposals were reviewed. One proposal from Nepal for CAD\$10,000 submitted by the Nepal Font Committee was approved to develop a standard font on computers for the Nepali script and to register it with Unicode.

Nepal Intranet

The Nepal Internet Users' Group (known as Nepal IUG) is being assisted by ICIMOD's Electronic Networking for Sustainable Mountain Development Project. Using technologies that Internet users are already familiar with, the Nepal Intranet Pilot Project will be an innovative project, seeking to establish connectivity between people in Nepal via Intranet. A grant of NRs600,000 was provided to Nepal IUG.

The Intranet project will initiate an information service that can be extended throughout Nepal at minimum cost and that links up information provided by a variety of organizations through a user friendly interface. Throughout the project, the capability of participants will also be improved through training and gaining practical experience using Intranet technologies.

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