

Access to and Benefit Sharing for Genetic Resources and Indigenous Knowledge in Nepal

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1.0 Introduction

Nepal signed the Convention on Biological Diversity (CBD) during the Earth Summit in June 1992, then ratified it in the fall of 1993. On 21 February 1994 the CBD entered into force in Nepal.

Nepal is situated in the Central Himalaya. It has diverse physiographic zones, climatic contrasts and altitudinal variations. This provides habitats for species from the Indo-Malayan and Paleo-arctic realms, including endemic Himalayan flora and fauna. Wild species inhabit about fifty-four percent of the surface area that is covered in vegetation. One hundred and eighteen ecosystems comprising seventy-five vegetation types and thirty-five forest types have been identified within these realms. Phyto-geographically, Nepal is also known to contain plant and animal species found in various floristic sub-regions, including the Sino-Japanese, Irano-Turanian, Central Asiatic and Indo-Malayan floristic regions. In general, Central Nepal is considered a meeting point of several eastern and western species.

Nepal Himalaya make up about 885 kilometres or one-third of the entire length of the Himalaya (i.e., 2,500 kilometres) that stretches from the Indus trench below Nanga Parbat (8,125 metres) in the west to the Yalungtsesang-Brahmaputra below Namche Barwa (7,756 metres). Nepal's area, 147,181 square kilometres, represents just 0.1 percent of the global land surface. Remarkably, however, it claims over 2.04 percent of the world's flowering plants. India and China, respectively twenty-two and seventy times larger than Nepal, have respective floral ratios with Nepal of 1:3 and 1:5.5 (see Table 2).

Similarly, Nepal possesses over 4.2 percent and 8.5 percent of the world's total mammal and bird species. Over four hundred species of agro-horticultural crops are thought to be in Nepal. Of these, about fifty species have been domesticated for commercial and household consumption. At present, 8400 accessions of cereals, grains, legumes, oil seeds, vegetables, industrial crops and spice crops are stored *ex situ*.

Country	Share of World's Land Area	Share of World's Flowering Plant Species	Forest Cover (%)
China	7.0	11	18
India	2.2	6	14
Nepal	0.1	2	42

Sources: Ryman J.C. 1982. World Watch Paper 108. Worldwatch Institute, Washington DC; Groombridge B. (ed.). 1992. GLOBAL BIODIVERSITY: STATUS OF THE EARTH'S LIVING RESOURCES. World Conservation Monitoring Centre, Cambridge.

Intrinsic species values have led Nepal to give utmost importance to in situ and ex situ species conservation. Over the last two and half decades protected areas have been established or strengthened in representative ecological zones. The protected areas network covers about sixteen percent of the country's total area. Eight national parks, four wildlife reserves, one hunting reserve and three conservation areas are legally protected. Policies, legal measures and programmes have ensured species conservation by focusing on empowering local people and sharing benefits. The National Conservation Strategy (1988), the Forestry Sector Master Plan (1989), the Environmental Policy and Action Plan (1993) and the Agriculture Perspective Plan (1996) and recent periodic plans, are the major policy instruments to guide preservation efforts for wildlife, forest and agriculture species.

The Constitution of the Kingdom of Nepal (1990) provides that it is necessary to conserve the country's rare animal species, its forests and vegetation. Under this broad framework, the Forest Act (1993), the Forest Rules (1995) and the National Parks and Wildlife Conservation Act (1973, as amended) empower the local people and create revenue sharing mechanisms for them. The three laws have contributed significantly to biodiversity conservation with people's participation.

All three laws are implemented by prioritising human resources, establishing or strengthening institutions, ensuring inter-sectoral co-ordination and encouraging and promoting communities to implement activities jointly or individually. Various programmes are on going including those to conserve biodiversity and prevent its further depletion, to demonstrate and replicate effective community participation approaches and increase the socio-economic standing of the people. Reasonable amounts of money have been devoted to natural resource management to make the programmes effective.

Biodiversity is a resource for sustained use. The goal is to integrate biodiversity conservation with socio-economic development.

Within this framework, and as a component of the five-year GEF-funded Biodiversity Conservation Project, Nepal is preparing a National Biodiversity Action Plan to streamline its species conservation efforts. First drafted in 1998 the final version of the Action Plan is nearing completion following several revisions.

The National Biodiversity Action Plan considers sectors that influence biodiversity. Sectoral analysis will identify those species contributing to the development of different sectors. Inter-linkages will be established between the sectors identified. The Action Plan will reflect cross-sectoral needs, refine priorities and develop investment proposals to implement effective conservation programs.

In spite of these various policy, legal and programmatic interventions, some species within and outside protected areas are either threatened or vulnerable due to habitat loss or change. Some of the current threats to biodiversity are related to habitat loss or alteration, over-exploitation of some commercial species, illegal hunting and poaching, over-grazing, fire and increased commercial trade. To address these emerging concerns, community and leasehold forestry have been promoted; benefit sharing mechanisms have been institutionalised legally; and an environment trust fund has been set-up and operated. Institutions are strengthened, and time-bound projects and annual programmes are implemented with communities, international and national NGOs as conservation partners. His Majesty's Government of Nepal (HMG) has allocated a development budget in the forestry and agriculture sectors totalling about US\$ 43 million. This money will be used for all types of activities during the 1997/98 fiscal year. An estimated twenty percent of this budget may be used to administer biodiversity conservation.

To fulfil the need to fund additional species conservation efforts, a concept proposal has been developed and submitted to the GEF/World Bank for a US\$ 25 million Biodiversity Trust Fund. Once the Action Plan is in place, details on programmes, budget, schedules, monitoring and evaluation processes and indicators will also be in place.

Nepal has successfully launched community forestry programmes all over the country while managing buffer zones adjacent to protected areas. Nepal's experience on species conservation and sustainable use has enabled it to re-think conservation as something for the people. Consequently, local people are to be involved in all stages of the conservation activity, from the planning and

implementation stages to monitoring. As a result Nepal has changed its conservation policy from a government-managed and protection-oriented regime to a community-managed sustainable approach. The people are clearly very enthusiastic about this endeavour. Their spirit is maintained by changing policies and amending existing legislation to empower them in resource management and revenue sharing. The efforts of HMG have significantly increased the number of protected wild animals, have encouraged greater germplasm conservation and have helped to resolve park-people conflicts.

Current initiatives indicate that the CBD's objectives for conservation, sustainable use and benefit sharing for genetic resources will be achieved in Nepal. There is hope for biodiversity. But unless species conservation provides a direct benefit to the rural people, it will be very difficult to attain sustainable development goals. The goal cannot be attained in isolation. We need to encourage and motivate the larger sector of society in this endeavour.

2.0 Genetic Resources and Benefit Sharing

The genetic resources of Nepal currently in demand can be classified within three categories: (1) agriculture and horticulture, (2) livestock and fisheries and (3) non-timber forest products (NTFP). They are found in farms, fields and forests. The use, propagation and conservation of genetic resources are based upon Nepal's indigenous knowledge systems. Found in more than eight bio-climatic zones, Nepal's indigenous knowledge systems stretch across the country, from the sultry tropical habitats of the Tarai to the alpine and frigid habitats of the high Himalaya.

Nepal continues to be a predominantly agricultural country. Over ninety percent of its twenty million people depend upon agriculture as their primary economic activity. Forty-two percent of its gross domestic product is tied to agriculture. Agricultural practices are primarily subsistence-oriented. Most of the mountainous and hilly areas are not accessible by roads.

Nepal has been searched and researched by a large number of foreign scientists. Genetic materials are freely accessible from most parts of the country except from the national parks. Nepalese plants and animals protected under CITES appendices and also under Forest Regulations (1995) are not freely accessible. However it is suspected that a large number of NTFPs, including epiphytic orchid species, are illegally exported for their genetic resources. Similarly at least fifty plant species are regularly exported as medicinal herbs. However, no record exists to determine which of them is being used for their genetic resources.

Biologists have documented over two hundred and fifty thousand species of higher plants around the world. The World Health Organisation has listed over twenty-one thousand species (8.4 percent) with medicinal uses. Among them only five thousand have been scientifically investigated. Many belong to Asia's highlands and mountains. Nepal alone has over six thousand five hundred higher plant species and about five hundred of them have medicinal properties. The phytochemistry of the majority has not yet been investigated systematically.

Therefore, the region's scientists have a great opportunity to contribute to the search for new substances that meet the therapeutic needs of human being all around the world. Fundamental questions remain to be answered however. For example, who should pay for the research and who is willing to pay? How can the interests of developing countries that provide genetic resources and indigenous knowledge for research be protected? Can a research and development protocol be used to build-up local capabilities, while ensuring the intellectual property rights of indigenous people that provide indigenous knowledge that is used in drug development? Examples can be drawn from the use of *Rauwolfia serpentina*, *Dioscorea deltoidea* or even turmeric (*Curcuma longa*).

To ensure benefit sharing, research on natural products must create well-defined links between manufacturers and their markets. To bring the benefits promised by international instruments such as the CBD, Agenda 21 (Mountain Agenda), South Asian Association for Regional Co-operation (SAARC) declarations and various regional agreements to the people who safeguard conservation and provide traditional knowledge a national policy and a regional plan are warranted.

Benefit sharing with the Himalayan people has never been ensured when Himalayan genetic resources have been exploited. For example, the region's Red Jungle Fowl is the progenitor of the world's chicken. What percentage of profits has the world chicken market ploughed back into Red Jungle Fowl conservation efforts? None. Similarly, the reserpine holds a US\$400 million market in the United States of America. However, Nepal, India and other countries remain empty-handed despite the fact that *Rauwolfia serpentina* belongs to this region, and reserpine's discovery was based on the ethno-pharmacological knowledge that belonged to the region's people.

Four years since Nepal ratified the CBD, it has been unable to afford appropriate steps to implement the Convention's access and benefit sharing provisions. Access and benefit sharing issues are readily over-shadowed by the more pressing need to combat poverty, hunger and disease. To ensure CBD implementation, Nepal needs immense support from and collaboration with her neighbours and

friendly countries. Earlier work has made it possible to partially inventory flowering plants and ferns, mammals, reptiles, fishes, birds and butterflies.

This situation is set to change with the advent of a preliminary draft legislation to establish a national framework on access to genetic resources and benefit sharing. The draft recognises Nepal's sovereign right over genetic resources and ownership over such resources is vested with the Nepalese Government and individuals depending on whether the resources are to be taken from wild or domesticated animals respectively. The draft also proposes the establishment of a competent national authority to administer the legislation. There are also provisions for the protection of traditional knowledge and the reward of indigenous communities where such knowledge is accessed.

3.0 Traditional Knowledge and Benefit Sharing

The Himalaya is one of the richest regions for biological and cultural diversity. The Indo-Aryan and the Tibeto-Burman peoples merge here. The cultures of the endemic types of ethnic people like Chepang and Raote are on the verge of extinction. Nepalese regard Nepal as a country of four casts and thirty-six creeds. About one hundred languages are still spoken.

Diverse ethnic groups have developed their own indigenous knowledge systems to provide food, clothing, shelter, health care and spiritual needs. Traditional knowledge to cultivate a large number of crops including the highest altitude (2600 metres) rice variety, to cross-breed animals such as yak and lowland cattle, to cure ailments with herbal remedies and to hunt and gather natural products is key to biodiversity conservation efforts.

The tradition of using herbs to heal ailments goes back to antiquity. Ayurveda, the most ancient system of medical treatment, dates back to the Vedic ages (1500-800 B.C.). In Nepal actual Ayurvedic textual materials were accessed during the late 9th century (879 A.D.) when a local physician copied the Susruta Samhita Sahotara. The medical heritage of Tibetan medicinal treatises dates only from the eight century. Tibetan medicine also derives its theory and a great number of practical applications from Indian Ayurvedic medicine. A number of plant species are common to both the systems.

Ayurvedic medicine is prevalent not only in the districts bordering India but in some interior districts too. Government hospitals and health posts are spread across the region to deliver health services. However, the medicines are prepared back in Kathmandu or in India. The government's service delivery in villages and

remote areas is much too weak. Consequently the people depend largely on faith healers and shamanistic treatments.

Various ethnic groups in the mountainous region have their own community physicians. Although the mode of treatment may differ slightly, the bulk of medicinal sources comes from the same type of plants. An ethno-botanical study in a typical hill district, Makwanpur, inhabited by the Chepang tribal community, illustrated that only nine out of one hundred and seven species have a common use. The others differ either by the disease treated or the plant parts used. Some of these folklore plants, such as *Scutellaria discolor*, are used widely in Nepal and also in China. *Scutellaria discolor* is a source of four new flavanoides and a new chalcone.

In India, as early as 4500 B.C. - 1600 B.C., some of the plants such as Ephedra species, were recorded in the Rigveda to have wonderful medicinal properties. In China, as early as 2700 B.C., Emperor Shen Nung wrote about *Ephedra*. Even today research on the Nepalese *Ephedra* species is still being carried out and results are still being published.

The research potential of traditional medicinal plants is particularly high in Nepal not only because of the country's biophysical diversity, but because Nepal is so culturally diverse as well. Some of the cultures are dying out and some of the natural areas are being transformed or denuded. Time is running out. A rapid programme has to be devised to generate information to safeguard indigenous knowledge and the biological resources upon which the knowledge is based.

It is envisaged that the passing of the current draft legislation on access to genetic resources and benefit sharing in the near future will provide the legal basis for utilising the traditional knowledge of Nepal's for the benefit of traditional communities whilst ensuring that such knowledge is respected and allowed to evolve further.

4.0 National Access and Benefit Sharing

Of the three CBD objectives the third objective is achievable if there is a rigorous national planning exercise in Nepal. His Majesty's Government of Nepal has constituted a National Biodiversity Unit (NBU) under the aegis of the Ministry of Forests and Soil Conservation. Intersectoral co-ordination will be carried out by the NBU to implement the CBD.

Biodiversity conservation policy has been tightly linked to Nepal's forest and agriculture policies. The policy focus on forest management was re-directed after the mid-1970s towards community participation. Accordingly, emphasis was placed on developing and managing conservation areas, rather than the national parks and wildlife reserves, by involving the individuals, communities and NGOs in species management. Consequently, Nepal visualised the need for a trust fund to share benefits accrued from protected areas network. It materialised as a deliberate policy intervention in the Eighth Plan (1992-97), formulated after democracy was re-instated in 1990.

Thus far, legal tools for biodiversity conservation have focused on resource protection, conservation and sustainable use. Box 8 provides a list of biodiversity-related policy and law in Nepal.

BOX 8: Biodiversity-related Policy and Law in Nepal

1. Aquatic Life Protection Act (1961)
2. National Parks and Wildlife Conservation Act (1973)
3. Plant Protection Act (1973)
4. Soil and Water Conservation Act (1982)
5. King Mahendra Trust for Nature Conservation Act (1982)
6. National Conservation Strategy (1988)
7. Master Plan for Forestry Sector (1988)
8. Water Resources Act (1992)
9. Electricity Act (1992)
10. Forest Act (1993)
11. Environmental Policy and Action Plan (1993)
12. Agriculture Perspective Plan (1996)

In 1957, HMG enacted the Wildlife (Conservation) Act to conserve wildlife and to regulate hunting. As wildlife populations began to decline and habitat was disturbed, HMG declared certain areas protected to conserve wildlife and habitat. Accordingly, the National Parks and Wildlife Conservation Act (1973) was enacted by repealing the previous Act.

The Forest Act (1993), and the Forest Rules (1995), were enacted to ensure that forest resources are developed, conserved and properly used through people's participation. They contain provisions to prepare operational plans to manage of all forest types. The Act also empowers the government to

declare as a protected area any part of national forests if it has environmental, scientific and cultural significance. The Act has been effective in elevating some plant species to a protected category.

The Plant Protection Act (1973) regulates the export and import of plant products. The Aquatic Life Protection Act (1961) empowers the government to punish any person using poisonous, noxious or explosive materials in water bodies, or destroying any dam, bridge or water system with the intent to catch or kill aquatic life. The Soil and Water Conservation Act (1982) empowers the government to declare any area a protected watershed area to control land use activities. The Water Resources Act (1992) and the Electricity Act (1992) require environmental studies prepared under their direction to address species requiring conservation measures.

The draft legislation on access to genetic resources and benefit sharing thus marks an attempt to co-ordinate the roles of these various institutions through the establishment of a competent national authority to administer access and benefit sharing issues. This may set the stage for a common/national approach to access to genetic resources and benefit sharing.