



Biodiversity in the Hindu Kush-Himalayas

Frequently asked questions

ICIMOD

FOR MOUNTAINS AND PEOPLE



What is biodiversity?

Biodiversity is the combination of all life forms, including their interactions with the surrounding physical environment, and functional aspects. It is defined as “the variability of living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystems” (Convention on Biological Diversity).

What is agrobiodiversity?

Agrobiodiversity means related to agriculture, and includes all crops and livestock, their wild relatives, and all the interacting species of pollinators, symbionts, pests, parasites, predators, and competitors. Agrobiodiversity has been continuously maintained and conserved by farmers and herders over generations.

Why is biodiversity important?

Biodiversity is the basis of life, and is needed to maintain the biosphere as we know it. It provides the food we eat, the clothes we wear, and materials for housing. It affects key ecosystem processes such as productivity, nutrient cycling, stability, resilience, and evolution; these processes in turn ensure multiple benefits to mankind through various ecosystem goods and services.

What are ecosystem services?

Ecosystem services are the benefits obtained by people from ecosystems. These include provisioning services, such as food, water, timber, fibre, genetic resources, and medicines; regulating services, such as regulation of climate, water and soil quality, and pollination; cultural services, such as recreational, aesthetic, and spiritual benefits; and supporting services, such as soil formation and nutrient cycling.

How does biodiversity affect human wellbeing?

The availability of a wide range of biodiversity increases food security, and people’s ability to adapt stresses; while its loss increases people’s vulnerability to disasters. Having a wide variety of food adds to our health; and wood and other biomass is an important source of energy, particularly in developing countries. Continued loss of biodiversity limits the availability of water for household use, and affects the productivity of the landscapes upon which human livelihoods and economy depend.



How can we quantify biodiversity?

Biodiversity is most frequently quantified as the number of species, but it is difficult to count these accurately. Current estimates of the number of species range from 5 to 30 million, of which only around 1.8 million have been described. The dynamics of biodiversity are captured through features such as abundance, frequency, dominance, variability, productivity, functions, interactions, and value.

Are there any patterns and trends in global biodiversity?

Biodiversity is unevenly distributed over the globe, with some areas exceptionally rich in biodiversity and/or endemic and rare species, or centres of genetic diversity. Some species can exist in many places, some in only a few (narrow range). The most prominent pattern is the increase in species richness from higher latitudes towards the tropical regions, and from dry to wet and humid areas. The global trends indicate that almost all of the earth's biodiversity has been influenced by human actions; the living planet index shows a decline in all environments between 1970 and 2000. The IUCN Red List shows that nearly a quarter of the world's mammals, one-third of amphibians, and 1 in 8 bird species are at risk of extinction.



What do endemic and indigenous mean?

Endemic species occur only in a (small) restricted geographical area; indigenous species are those native to an area (not introduced). In everyday language, the word 'endemic' is often used to mean 'native'.

What are Global Biodiversity Hotspots?

Conservation International has identified 34 'Global Biodiversity Hotspots' – areas of global conservation significance with exceptional biodiversity and a large number of endemic species, and severely threatened by habitat loss.



Biodiversity in the Hindu Kush-Himalayan region

What makes mountain biodiversity special?

Mountain biodiversity is shaped by the extreme differences in the physical environment and landscape (climate, soils, elevation, slope, aspect), with many ecosystems compressed into a short distance, as well as by the distinctive socio-cultural traditions of mountain communities. Mountains harbour many endemic, unique, and rare species, and are the home of the wild relatives of many modern food crops. Mountain biodiversity is an essential component in the ecosystems that maintain flows of freshwater. Mountain ecosystems are fragile and particularly vulnerable to natural and anthropogenic threats.

What is the significance of the region for biodiversity conservation?

Almost one-third of the Hindu Kush-Himalayan region is covered by all or part of four global biodiversity hotspots. The region contains 60 ecoregions, 330 Important Bird Areas, 53 Important Plant Areas, and a large number of wetlands, including 29 Ramsar Sites of which 14 are high altitude wetlands (above 3000 m). A wide variety of ecosystems support specialised biodiversity with many globally threatened, endemic, and migratory species, but



the biodiversity has not been fully documented. The forest ecosystems serve as a gateway for species exchange between the Indian and Malayan biogeographic realms. The wetlands shelter several species of migratory mammals and birds, and provide nursery grounds and feeding habitat for freshwater fish. The diverse farming systems support a high degree of agrobiodiversity. Biodiversity in the region is also closely associated with the lives of people, their culture, and traditions, and provides goods and services to people in the region, downstream, and beyond.



What are the major threats to the biodiversity?

Biodiversity in the region is influenced by changes in land use and land cover, climate, and demographics, and the impacts of globalisation. Major threats include habitat degradation (overgrazing, deforestation, monoculture, pollution, drainage); habitat fragmentation (habitat conversion, encroachment, infrastructure development); over-extraction of resources (poaching, illegal harvesting, commercial fishing); and introduction of non-native species. The table shows the estimated number of threatened species in the countries of the Hindu Kush-Himalayas.

Threatened species (from Vié et al 2009)

	Mammals	Birds	Reptiles	Amphibians	Fish	Molluscs	Other invertebrates	Plants	Total
Afghanistan	11	13	1	1	3	0	1	2	32
Bangladesh	34	28	20	1	12	0	2	12	109
Bhutan	28	17	1	1	0	0	1	7	55
China	74	85	30	90	70	1	20	446	816
India	96	76	25	65	40	2	109	246	659
Myanmar	45	41	22	0	17	1	63	38	227
Nepal	32	32	7	3	0	0	0	7	81
Pakistan	23	27	10	0	22	0	15	2	99

How will climate change affect biodiversity in the HKH?

The lack of climate-based biodiversity data and research in the region makes it difficult to assess the impact of climate change on biodiversity. Equally, climate change is only one of many factors affecting biodiversity, and difficult to assess separately. Some possibilities are indicated by the projected climate trends. For example, climate change may increase the risk of extinction of species with a restricted range, and affect vulnerable ecosystems like riverine islands, wetlands, sub-alpine and alpine transition zones, and sub-alpine and

alpine meadows. Forest and agricultural productivity may decline. Exotic, invasive, noxious weeds might be favoured, and forest fires and pest and diseases may increase. Peatlands and wetland may dry, and desertification of alpine zones may hasten. Species distributions, population size, and phenology are likely to change considerably.



Has globalisation affected biodiversity in the region?

Globalisation has increased interest in the use of many mountain plants and animals, and introduced methods for adding value to mountain produce. While this has led to increased protection of many non-timber forest products, some of the market friendly medicinal and aromatic plant resources are overexploited and indiscriminately harvested. Increased single crop agriculture is reducing the genetic variability among domesticated plants and animals. Mountain niche products may decline, leading to the gradual erosion of traditional practices and protection approaches.

What is being done to protect the regional biodiversity?

All eight countries of the region are signatories to the Convention on Biological Diversity (CBD) and see biodiversity conservation as a national priority. Altogether 39% of the land area has been included in close to 500 protected areas, including 40% of the area covered by critical ecoregions. Protected landscapes and habitat management areas have increased with increased adoption of more people-oriented conservation through the ecosystem approach advocated by the CBD.

How has ICIMOD facilitated biodiversity conservation in the HKH?

ICIMOD's biodiversity conservation framework revolves around the three CBD objectives of conservation, sustainable use, and fair and equitable sharing of benefits. ICIMOD promotes large scale conservation planning through an ecosystem approach in seven transboundary conservation landscapes across the region. It facilitates cooperation among strategic partners within a commonly agreed regional cooperation framework aimed at improving the lives and livelihoods of mountain communities; increasing environmental, ecological, socio-cultural and economic resilience; and supporting design of practical strategies, legislation, and guidelines on transboundary conservation and access and benefit sharing.





What are the 2010 biodiversity targets?

In 2002, the Conference of the Parties to the CBD adopted targets aimed at achieving “a significant reduction of the current rate of biodiversity loss at the global, regional, and national levels ... by 2010”, with 11 specific goals and a series of sub-targets focusing on various aspects of biodiversity. There has been reasonable progress in the region, particularly in terms of coverage of protected areas; adoption of an ecosystem approach in conservation planning; sustainable use and value additions of mountain niche products; and development of national and regional policy innovations for access and benefit sharing.

Can economic incentives influence biodiversity conservation?

Biodiversity is closely associated with people’s lives and livelihoods. Economic incentives can encourage the conservation and sustainable use of biodiversity. Communities are willing to lead conservation actions if they have incentives, for example as direct payment for maintaining forests or certain habitats to ensure continued ecosystem goods and services, or indirect benefits through promotion of alternative livelihood options linked to conservation.

What governance approaches promote biodiversity conservation?

To be effective, biodiversity conservation requires strong institutions at all levels – local, regional, and national. Indigenous knowledge needs to be integrated with scientific research, and biodiversity conservation and sustainable use activities with the larger decision-making frameworks. Regional cooperation must be the basis for regional actions to address transboundary issues and strengthen a regional voice towards understanding global trade offs and incentives related to biodiversity management.

How can we protect the regional biodiversity?

Information and awareness is the key. We need to gain a better understanding of interactions among different drivers, the linkages between land-use systems along elevation gradients, and the feedback from socioeconomic systems. We need to explore ways of mainstreaming ecosystem services within a conservation framework, and sustaining services through economic valuation. A regional approach should be promoted to narrow the gaps in knowledge and encourage environmental monitoring, to support climate change adaptation, and towards making international research regionally usable and locally relevant.

Further reading

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For further information contact

Nira Gurung: info@icimod.org
Nakul Chettri: nchettri@icimod.org
Bandana Shakya: bshakya@icimod.org

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Photos: Kamal Aryal, Nabin Baral, Nakul Chettri, Jakob Jespersen, Fang Jing, Elisabeth Kerkhoff, Beatrice Murray, Krishna P Oli, Kamal Raj Rai, Bandana Shakya, Yi Shaoling, Alex Treadway,

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International Centre for Integrated Mountain Development
 GPO Box 3226, Kathmandu, Nepal
 Tel +977-1-5003222 email info@icimod.org web www.icimod.org