

1.1.3 Biodiversity

Nepal's richness of species diversity can be attributed to her large topographical, vertical dissimilarities, and climatic variations. Biological species establish symbiotic relationships with other resources and contribute to protecting natural resources. However, these aspects are yet to be documented in detail.

About 118 types of ecosystems (natural biomes) have been identified in different physiographic zones of Nepal. Only in the Middle Mountains 52 ecosystems exist, followed by the Highlands with 38 ecosystems (Maskey, 1995; BPP, 1995).

Nepal is home to several species of wild plants. She has over 2 percent of flowering plants, 3 percent of pteridophytes, and 5 percent of bryophytes of the world's flora (Table 1.4). Of them, 248 and 246 species of lower and higher plants are endemic to Nepal. In view of the species diversity in wild habitat, Nepal occupies 25th position and 11th position on the global and continental basis respectively (MFSC, 2000).

Table 1.4 Nepal's Share in Wild Plant Species

(In number)

Group	Family	Nepal			World Species	Nepal's Share (%)
		Genera	Species	Endemic sp.		
Bacteria		NA			>4,000	
Algae	50	150	687	13	>26,000	2.64
Fungi	80	552	1822	150	>69,000	2.64
Lichen	30	79	471	48	>20,000	2.36
Bryophytes	78	180	853	37	>16,600	5.13
Pteridophytes	31	103	383		>11,300	3.38
	269	1064	4216	248		
Flowering plants*	213	1496	5856	246	>220,000	2.66

Source: MFSC, 2000; Uprety, 1998.

NA = Not Available

Ninety-three species of the wild plants have *nepalensis* epithet such as *Alnus nepalensis*, *Begonia nepalensis*, *Centranthera nepalensis*, *Gynura nepalensis*, *Piper nepalense* etc. Out of the total species having *nepalensis* epithet, 32 species are endemic to Nepal (Shrestha and Joshi, 1996). Scientists have also named wild plants based on the name of the places from where they were first reported. For example, *Eriocaulon kathmanduense*, *Rabdosia dhankutanus*, *Cirsium phulchokiense*, and *Pedicularis annapurnensis* are endemic to Nepal, and they were first reported from Kathmandu, Dhankuta, Phulchoki, and Annapurna areas respectively. There may be many plants new to science, and it could be known after detail and frequent plant exploration.

Wild relatives of many plant species are cultivated and their germplams have been preserved at Nepal Agricultural Research Council (NARC), Khumaltar. There are over 10,600 samples of various crops (Shahi, 2001; Table 2.6). At other crop centres, duplicates of crop varieties are maintained at room temperature or in the defreeze conditions.

Nepal is also rich in wild animals. About 4.5 per cent of the world mammals are reported in Nepal. Over 9 per cent of the reported species of birds at the global level are found in Nepal (Table 1.5; MFSC, 2000). Out of the total species reported so far, 8 species of fish, 29 species of butterflies, 9 species of amphibians, 108 species of spiders, 2 species of birds and 1 mammal is endemic to Nepal (Uprety, 1998). However, 11 species of birds and 3 species of mammals are believed extinct from Nepal.

Table 1.5 Species Diversity in Wild Animals

Animal group	Species Numbers		Endemic Species	Nepal's Share
	Globally	Nepal		
Platyhelminthes	12,200	168		1.38
Spiders	73,400	144	108	0.19
Insects	751,000	5,052		0.67
Butterflies and Moths	112,000	640	29	
		2,253		2.01
Fish	18,150	185	8	1.02
Amphibians	4,184	43	9	1.03
Reptiles	6,300	100	2	1.58
Birds	9,040	844	2	9.14
Mammals	4,000	181	1	4.5

Source: MFSC, 2000; Uprety, 1998.

Species diversity has also been recorded amongst domesticated animals. Indigenous genotypes of livestock have been recorded in all ecological regions. For example, *yak* and *lulu* cattle, *chyangra* goat, and *bhyanglung* and *baruwal* sheep of the high Mountain regions have indigenous genotypes. Similarly, *kirko* cattle, *sinhal* goat, and *dhorel* sheep are found in the high Mountains. However, exotic genotypes of cattle, goat and sheep has been introduced in the Terai, Siwaliks and middle Hills. In terms of gene conservation, pure varieties of livestock are now only found in the trans-himalayan area.

Wild plants and animals are conserved within and outside the protected areas. So far, about 18 per cent of the total land area of Nepal has been designated as protected areas (national park, wildlife reserve, conservation area, and hunting reserve, including buffer zone). Similarly, 12 and 8 species of plants reported from Nepal are in the CITES Appendices II and III respectively and HMG has given protection status to 18 plant species (Annex 1 and 2). Furthermore, HMG has protected 26 species of mammals, 9 species of birds, and 3 species of reptiles under the *National Parks and Wildlife Conservation Act, 1973*. All the protected mammals except striped hyaena, bird excluding common crane, and reptiles are included in the CITES Appendices (Annex 3).

Nepal's agricultural system, particularly in the hills is based on land capability, animal and forest resources. Crop production depends on livestock manure, which is sustained by the fodder from the forests. In view of Nepal's landscape, it has been estimated that about 1 to 2.8 ha of forests is required to support one ha of arable land. Forest depletion is increasing due to firewood collection, cattle grazing, and also the conversion of forests to agricultural land. Livestock suffers from inadequate and nutrient-poor fodder supply, resulting in low manure production which leads to unsustainable agricultural development.