

Biodiversity

ICIMOD has a number of ongoing activities in biodiversity conservation. At the Godavari site, the emphasis is on providing the conditions to enable the degraded vegetation to return to a species rich semi-natural vegetation more closely resembling the original natural forest of the area. An increase in the biodiversity of the vegetation is likely to be accompanied by an increase in the faunal biodiversity. Many of the vegetation management activities at the site are also biodiversity management activities, they are described in more detail in the sheet on Vegetation Management.

The flora and fauna of the site was surveyed when the site was established, and additional sightings have been recorded ever since on a regular basis.

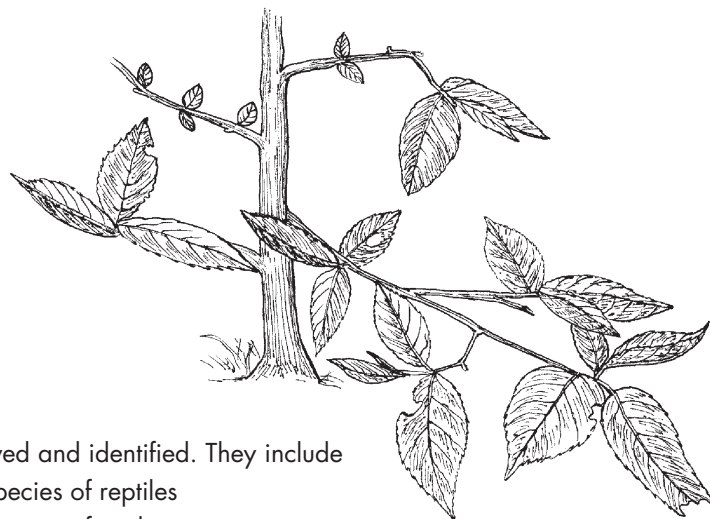
In 1993, only 394 species of plants were identified, by 1996 this had increased to 450, and by 2002 it was 694. The status as of 2002 is as follows.

Flora - A total of 694 species of flora have been identified; close to 10% of the reported 7000 vascular plants of Nepal. They include

- 3 endemic species
- 4 rare
- 3 exotic species
- 4 endangered species
- 22 threatened species
- 7 newly discovered species
- 20 fodder species
- 41 multi-purpose tree species
- 93 aromatic and medicinal species
- 31 poisonous species, and
- 54 edible fruit plants.

Fauna - So far 231 different species of wild fauna have been observed and identified. They include

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| 2 species of leeches | 4 species of reptiles |
| 2 species of earthworms | 7 species of snakes |
| 2 species of frogs | 5 species of large mammal |
| 2 species of toads | 6 species of small mammal |
| 2 species of crabs | dragonflies |
| 1 species of preying mantis | ants |
| 6 species of spider | centipedes |
| 97 species of butterflies | millipedes |
| 88 species of birds, (1 endangered, <i>Arborophila mufogalis</i>) | |



Biodiversity Conservation: Development of Swampy Wetland Area (Map Site 7.1)

Recently, ICIMOD embarked on a new project for biodiversity conservation and promotion: development of a useful swampy wetland area in a water-logged part of the site. Swampy wetland is land that can be used for growing plants which like their roots

to be permanently wet like water iris and rushes. Developing swampy wetland with ponds surrounded by swampy areas planted with useful and/or decorative plants is a better way of using waterlogged land than struggling against nature by trying to drain it. A 'bog' or 'swamp' garden makes an attractive and conventional feature in informal or naturalistic landscaping. Such a garden provides a gradual and natural transition from aquatic to moisture loving plants with ideal conditions for amphibians and other wildlife. It provides a site for conservation of a specialised group of plants and animals.

The objectives of the wetlands development site are

- reclamation of an unused wetland/swampy area
- collection of unused water
- enrichment planting while retaining the existing useful species
- creation of an interface between the wetland and surrounding terrestrial system for conservation of valuable biodiversity
- on site education and training in conservation

The wetlands site is used to demonstrate to farmers and development workers another possibility for using an area usually considered as 'waste' land which is not only attractive, but also allows growth of useful species like rushes and, at the terrestrial interface, large cardamom.

Collection, Identification and Conservation of Orchids (Map Site 7.2a), and Wild Edible and Medicinal and Aromatic Plants

Research and vegetation management on the site is not confined to trees and bushes. A focused effort is being made to identify, conserve, and encourage the growth of other useful species of plants that can offer opportunities for income generation, or supplementing diets or medicinal care.

So far some 35 different varieties of orchids have been found growing wild or have been introduced to the site. Plants have a potential for sale for garden landscaping and the cut flowers of many varieties are very long-lasting and are sold by florists. The Himalayan Region is a repository of medicinal herbs; and the Nepal Himalayas possess some of the most distinctive flora in the world. Nearly 100 species whose leaves, flowers, roots, bark, seeds or other parts are valued for their medicinal or aromatic qualities have been collected, identified, and conserved at the Godavari site. These plants are important ingredients in food, medicine, perfumery, and cosmetics, and are used as garden plants. Research focuses on methods of growing larger quantities of some particularly interesting plants, and methods of collection and processing of others.



More than 50 wild edible plants have also been identified at the site, including plants with leaves and shoots that can be used as leaf vegetables, salad, and pickles, and plants that produce edible fruits and berries. Recognition of these plants can help farmers to improve and supplement their families' diet.

Beekeeping (Map Site 5.1)

The beekeeping activities described in the sheet on 'Income Generation' also serve biodiversity conservation by means of pollination through the indigenous honeybee species *Apis cerana*. There are six indigenous species of honeybee in the HKH region, but *Apis cerana* is the only one that can be kept in hives and managed directly. ICIMOD's bee project is also investigating ways of maintaining and increasing the numbers of the other wild honeybee species. Conservation of indigenous bees also supports conservation of indigenous flora, which in turn supports conservation of indigenous fauna. Some indigenous plants are not pollinated by the exotic *Apis mellifera* bees.

