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# UNIT 17 INDIA'S BIODIVERSITY: LANDSCAPE, ENVIRONMENT AND ECOLOGY

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## 17.0 OBJECTIVES

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As a tourism professional you have often wondered at the variety and range of queries put to you by an itinerant tourist regarding the landscape, ecology or environment of this country. It is true that several of you have either tried to avert such enquiries or escaped by providing replies which even you knew were not going to satisfy the tourist fully. In this Unit we have decided to give you information on these aspects in such manner that your needs are more than ever met and you also have leads to relevant material if such enquiries further deepen. Thus, in this Unit you will find details on the following:

- geographical features,
- ecological variety, and
- environmental concerns in India.

Subjects like the landscape, ecology and environment have been grouped under the common nomenclature of **biodiversity**.

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## 17.1 INTRODUCTION

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India is one of the greatest civilizations of the world, the continuity of which is traceable back to thousands of years. A decisive factor in shaping India's culture and history has been its geography and ecology. Beginning from the snow-clad peaks of Himalaya in the north to the sea encased southern peninsula, India is a veritable mosaic of landscapes and environment. With a variety of climatic conditions and therefore a wealth of flora and fauna, it becomes a place of natural choice for tourists from abroad as well as for domestic tourists desirous of experiencing other regional cultures. But to market this vast repertoire of natural wealth, you must, as a tourism professional, acquaint and equip yourself thoroughly with the fact sheet of India's biodiversity. In the following sections we have compiled and discussed information on biodiversity which we hope will be extremely useful to you.

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## 17.2 GEOGRAPHY OF INDIA

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In this Section we talk about the geographical features of India. The thrust is on the requirements of a tourism professional.

## 17.3 ECOLOGY OF INDIA

India's biodiversity: Landscape, Environment and Ecology

Ecology of India is of vital concern to the tourism professional. For example a tourist guide/escort may be asked which plant is this? What animals are found here? Or which flowers grow in this season? It is therefore important that you know the details of India's ecological wealth. In the following sub-sections we have described for you the main features of India's flora and fauna. However, you will have to find out yourself specific features of the region you stay in.

### 17.3.1 Forest Wealth

Forests have grown where good weathering and leaching of soil has taken place due to rain. These vary from extremely arid xerophytes to evergreen mesophytic biological forms, rich in biogenetic diversity of species and density. Over 45,000 plants including 15,000 flowering plants have been identified in India. Of these, about 5,000 are endemic to India. The conifer forests of fir, spruce, kail, deodar, and chir pine are in the Himalaya. The holloc (*Terminalia myriocarpa*, *Dipterocarpus macrocarpus* and *Hopea*) are tall broadleaf trees exceeding 50 m in height, in the rain forests. The deciduous sal (*Shorea robusta*) and teak (*Tectona grandis*) grow gregariously in monsoon forests. The former in northern India and the latter in southern India, the Narmada being the divide-line of the two species. Each one of the two species displays its own pattern of distribution. Massive fructification of tendu (*Diospyros melanoxylon*), mahuwa (*Madhuca indica*), aonla (*Emblica officinalis*), harra (*Terminalia chebula*), bahera (*T. belarica*), bel (*Aegle marmelos*), ber (*Zizyphus jujuba*), pipal (*Ficus religiosa*), bar (*F. bangalensis*) and gular (*F. glomerata*) add food for the wild animals. Tendu leaf is the indigenous cigarette paper wrapping local tobacco for biri making and mahuwa flower, rich in sugar, is the base for brewing local liquor. Both species have much economic value at the provincial or local levels.

Rose wood (*Terminatia latifolia*) and Chandan (*Santalum album*) with the aromatic heart wood tree, grow in deciduous forests. Semal (*Bombax Ceiba*) is the India silk cotton tree, dhak (*Butea monosperma*) the flame of the forests, kachnar (*Bauhinia variegata*), amaltas (*Cassia fistula*), the India laburnum and Jarul (*Lagerstroemia Flos Reginae* and *Erihrina indica*) are some of the colourful flowering trees which grow over a wide tract of the country. They hardly have smell but store nectar. The ronj (*Acacia leucophaea*), morsali (*Mimusops elengi*), kadamb (*Anthocephalus Kadamba*) and kalam (*Myrtigyna parvifolia*)—the legendary tree of Krishna-bear macroscopic inconspicuous flowers on a gobose head but their fragrance is mild and pervasively pleasant. Harsringar's (*Nyctenthes arbortristis*) sudden puff of scent holds a passer-by in surprise. The kair (*Capparis decidua*) in the hot desert and rhododendrons (*Rhododendrons hodgsonii*) in the temperate high Himalayas are flowering shrubs of bright red flowers.

### 17.3.2 Floral Plants

Lilies and lotus cover all fresh water swamps. Some lilies such as kamodini (*Nypheoides, cristata, N. nouchali & N. pubescens*) flower at night and close during the day while others like lotus (*Nelumbium*) prefer to brave the bright August sun. But of parallel beauty is the bright rich pink lotus of the warm tropics of the south. A lotus-like flower on an evergreen tree is champa (*Magnolia griffithii*). There is no extravagance in nature. If the flower is brightly coloured it has lots of nectar but no scent. On the other side those which do not have the gift of splashing colours have sweet smell to attract. Their pollens are the food for the pollinators.

The other variety is that of creepers. Creepers attempt to reach the top without the strength to do so. The *Bauhinia vahlii* is an example of such a giant effort. Its leaf is large and bilobed and reaching the top shades the support tree to death. The woody climber demonstrates nature's brute law of competition. In summer, pendants of flower hang from the branches. It has wide distribution throughout the monsoon forests. *Entada sendens* is a mile long creeper—the longest in the world—and is found in rain forests. Bamboos, including the giant bamboos (*Bambusa tulda*) are all grasses. The common bamboo (*Dendrocalamus strictus & Bambusa arindinacia*) occur in pure bamboo glades or mixed with other species as well as the under-storey of sal and teak forests. Carie (*Calamus tenuis*) is another killer climber but most dreadful is *Mikania micrantha*, a weed, which spreads on the ground as well as on trees to shadow all plants to death



Semal



Indian Laburnum



the emerald greens of the shaded waters. Green pigeons, golden orioles, bulbuls, laughing thrush, Malabar whistling thrush (*Myiophonus horsfieldii*), shamas, babblers, warblers, robins and larks are our song birds which delight by their melodiously soothing notes. The favourite talking birds are the hill myna (*Gracula religiosa*), large Alexander parakeet (*Psittacula eupatria*) and blossom headed parakeets (*P. cyanocephala*). The cuckoos are the noisy ones, rightly called brain fever birds due to their harsh calls. The koel (*Eudynamis scolopacea*) has a comparatively milder melody.

The peacock (*Pavo cristatus*) is a legendary bird of Indian mythology and now a national bird. It has no parallel in the design of its colourful tail feathers called train, consisting of moons and crescents and metallic blue neck. It is too common in Western India due to religious protection given to these birds. The Great Indian Bustard (*Choriotis nigriceps*), a grassland bird, is a miniature Ostrich. The houbara bustard (*Chlamydotis undulata*)—talked in connection with Arab falconers — is a miniature of the former. The third of the bustard groups are the Bengal florican (*Eupodotis bengalensis*) and lesser florican (*Sypheotides indica*). All, except the houbara which is a winter visitor in the Western India, are our resident birds. The tallest flight bird of India is the saras crane (*Grus antingone*), conspicuously seen breeding in the north Indian plains during the monsoon. The rare black neck cranes (*G. nigricollis*) nest in Ladakh. Common cranes (*G. Grus*) Demoiselle cranes (*Anthropoides virgo*) and Siberian Cranes (*Grus leucogeranus*) migrate to India in winter. The first two arrive in hundreds and thousands in the western India and the third only in a small number at Bharatpur, in Rajasthan. The black neck stork is the most colourful among the six stocks of India.

Birds of prey are represented by hawks, eagles, vultures and falcons. The largest raptor is the tawny eagle (*Aquila ropax*) with a wing spread of over two meters. Hawk eagle (*Hieraaetus pennatus*), Bonelli's eagle (*Heiraaetus fasciatus*), crested serpent eagle (*Spilornis cheela*), laggar falcon (*Falco jugger*), marsh harrier (*Circus aeruginosus*), Shikra (*Accipiter badius*) and shahin (*Falco peregrinus peregrinator*) are considered as the tigers of the desert sky. Owls include collared scopes owl (*Otus bakka moena*), forest eagle owl (*Bubo nipalensis*), and forest spotted owlet (*Athena blewitti*). Those who enjoy scoring flights are the vultures, particularly Indian white back vulture (*Gyps bengalensis*).

**Mammals:** India has the unique distinction of having as many as 372 species of mammals distributed over a wide variety of habitat types, varying from luxurious tropical rain forests to the hot Thar desert of Rajasthan and arctic cold deserts of Ladakh. They represent all the major orders of mammals of the world, including prime predators. Of these tigers (*Panthera tigris*) and common leopard (*Panthera pardus*), are well distributed in the country while snow leopards (*Panthera uncia*) are confined to the higher Himalayas. Another variety — the clouded leopard (*Neofelis nebulosa*) is actually not a member of the *Panthera* genus. It is found only in north-eastern India where it leads an arboreal life as a nocturnal predator. The lion (*Panthera lion*) is highly localized in the Gir forests of north western India. The hunting cheetah (*Acinonyx jubatus*) is also said to have existed in India though there is no record of this prior to the Mughal rule. Presently it is extinct in India. There are eight species of cats. These include:

- lynx (*Felis lynx*),
- caracal (*Felis caracal*),
- desert cat (*Felis Libyca*),
- jungle cat (*Felis chaus*),
- fishing cat (*Felis viverrina*),
- leopard cat (*Felis bengalensis*),
- palla's cat (*Felis munal*) and the most beautiful
- marbled cat (*Felis marmorat*)

All of them are endangered species. There also exist civets of the following varieties:

- bear cat binturang, (*Arctictis binturang*),
- marbled polecat, (*Voremela peregusma*),
- Chinese fervet badger (*Melogale moschata*),
- Burmese ferrat bodgeer (*Melogale personata*).

2) Name the lilies that flower at night and in the day time.

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3) Name three game birds:

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## 17.4 ENVIRONMENTAL CONCERNS

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By now you have become thoroughly acquainted with India's natural wealth in the form of flora and fauna. It is, therefore, time that you concern yourself with threats of extinction to this enormous environmental wealth of India.

### 17.4.1 Loss of Environmental Wealth

India's rich assemblage of animals is unique and this account of the wide spectrum of wild species and their numbers may give the impression that India is still a Kiplingesque wild paradise. It once certainly was, centuries ago, when man was not present or present only as a part of nature. But this bounty and beauty of nature could not remain a secret for long. Soon, invasion, plunder, loot and vandalism became the order of the day. The forests and wild animals languished in neglect. If there was any concern, it was for planned massacre of wild life by emperors and their retainers, in the name of *shikar*. To cite an illustration, the victim of Akbar's annual hunts exceeded 50,000 animals and birds. Fortunately slow communication and difficult and harsh climate served to localize the loss which was always recouped by the spillover from the adjoining vast jungles of the country.

The worst destruction of India's wildlife took place under the rule of the East India Company. Its servants had the time of their lives hunting tigers and leopards, slaughtering them in hundreds. So casual had they become about this that they often even did not care to keep a count of what they so wantonly killed. Wild animals, including tigers, were notified as vermin and bounty was given for producing a tail or a head. Even the snow leopards continued to be described as 'vermin' till the late nineteen sixties.

The independent India too the management was ad hoc or, at the most, based on erroneous empirical observations. The story of the skin trade was even more grim. The traders did not care how the wild animal's fur, skin or feathers came to them, nor were the managers bothered about what was happening to the resources. The common expression for the number of the wild population was "in plenty". With habitats destroyed, venison in the open market and skins available in bales for the fur trade, great wealth was being squandered. Our 38,000 tigers of 1938 were reduced to less than 2,000 in 1972 and 42 species came on to the threatened or endangered list.

The destruction of India's forests like its wildlife, began under the rule of the East India Company, about 250 years ago. Extraction of timber for ship-building and railroad sleepers in the United Kingdom as well as in India by the British companies was the principal cause. For meeting the needs of two World Wars, they justified excessive felling of the forests, as "war fellings". Killing of tigers in hundreds became a casual affair. But the worst was yet to come — it was the time of our transition from a colony to an independent country. The period of transfer of power proved to be ecologically disastrous. Even the planned felling of forests, though claimed to silviculturally authentic, was undertaken without any understanding of the function of the forest ecosystems. Our so-called scientific forestry, based on mathematical formulae and contractor or industry-oriented perspectives, only destroyed the forests more systematically.

**Check Your Progress 3**

1) How much of land area in India was under forest cover and how much more was needed for self-sufficiency in forest resources in 1952?

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2) Name three wildlife preserves in India declared as World Natural Heritage Sites:

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3) How many National Parks and Sanctuaries are there in India today?

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**17.5 LET US SUM UP**

India is a great landmass that is covered on three sides, like a peninsula, by the Sea. It has three main geographical regions — the Himalayas, the Indo-Gangetic plain, and the peninsula. India's river system comprises the Himalayan rivers, the Deccan rivers and the rivers of the inland drainage basin. It has wealth of flora & fauna. Forest trees, floral plants, and shrubs of many varieties grow in different topographical zones. India's animal wealth comprises the elephant, the last remaining lions outside Africa, tigers, rhinoceros, leopards, and several smaller cat species. A wide range of snakes, lizards and crocodiles comprise the main reptile population. Most of this fauna is protected under the Wild Life Protection Act.

**17.6 KEYWORDS**

<b>Aquatic</b>	relating to water
<b>Biogenetic</b>	idea that living things take birth from living things
<b>Birds of prey</b>	birds that live on catching other smaller birds
<b>Creepers</b>	plants that grow on some other support
<b>Endemic</b>	Something that is found among specific categories only
<b>Ephemerals</b>	lasting only a day
<b>Estuary</b>	tidal mouth of large river
<b>Gondwana</b>	the peninsular region of India
<b>Insectivores</b>	those who feed on insects
<b>Leaching</b>	pass through some material
<b>Local depressions</b>	low grounds
<b>Mammal</b>	class of animals that breast feed their siblings
<b>Mesophytes</b>	plants that need moderate amount of moisture for growth
<b>Predator</b>	animals that live by eating other animals.
<b>Primate</b>	highest order of mammals
<b>Reptiles</b>	class of animals including snakes, lizards, crocodiles etc.
<b>Rodent</b>	animals like rats, squirrels etc.
<b>Swamp</b>	piece of wet spongy ground
<b>Xerophytes</b>	plants that can grow in deserts