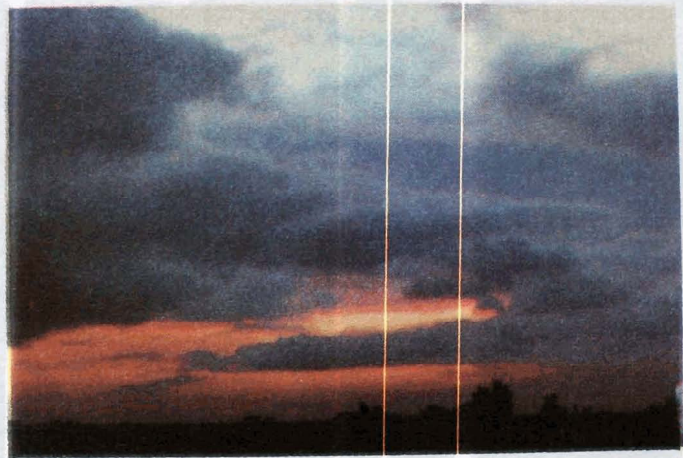


UNIT 17 INDIA'S BIODIVERSITY: LANDSCAPE, ENVIRONMENT AND ECOLOGY

Structure

- 17.0 Objectives
- 17.1 Introduction
- 17.2 Geography of India
 - 17.2.1 Physical Features
 - 17.2.2 Topography and Drainage
- 17.3 Ecology of India
 - 17.3.1 Forest Wealth
 - 17.3.2 Floral Plants
 - 17.3.3 Fauna
- 17.4 Environmental Concerns
 - 17.4.1 Loss of Environmental Wealth
 - 17.4.2 Nature Conservation
 - 17.4.3 Wildlife Preservation
- 17.5 Let Us Sum Up
- 17.6 Keywords
- 17.7 Answers to Check Your Progress Exercises



17.0 OBJECTIVES

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**.

17.1 INTRODUCTION

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.

17.2 GEOGRAPHY OF INDIA

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

17.2.1 Physical Features

Physically, India is a vast country, close to being a subcontinent, ranking seventh in area among the large countries of the world. It extends from 8° 4' to 37° 6'N and from 68° 7' to 97° 25'E. It has three main geographical regions (See Map-1 at the end of the Block).

- First are the high Himalayas in the North. They extend from East to West and are the world's highest mountains, many of them higher than 8,000 m. Mt. Everest is 8,848 m high.
- The second region is the Indo-Gangetic plain, the most crowded land mass of the world.
- The third region is the triangular peninsula, one of the world's geologically oldest land features. It is still called Gondwana. It has its apex in the Indian Ocean and its base abutting the Gangetic plains. The triangle's western side is slightly raised in the form of the Western Ghats and the eastern side in the form of the lower hill range of the Eastern Ghats.

India's splendid coastline of 5,700 km and its beaches are still largely primitively pure. There are also chains of offshore islands, many still virgin, where human populations, if present, mostly live in close harmony with nature.

17.2.2 Topography and Drainage

The topography and rainfall govern the subcontinent's drainage pattern. The Himalayas and the plains are drained by the Ganges and the Brahmaputra and their tributaries, flowing from north to south-east, except for the Sindh and the Luni which flow almost north-south through the desert. Some desert rivers never reach the sea. They are ephemerals draining into local depressions, forming salt lakes like Sambhar in Rajasthan. Most of the peninsular rivers — the Mahanadi, Godavari, Krishna and Kaveri — flow from west to east; among the major peninsular rivers, only the Narmada and Tapi flow westward and drain into the Arabian Sea. The rivers of northern India, when they reach the plains, flow slowly and their waters spill over to the adjoining lowlands, forming freshwater swamps. Though most of these swamps have now been drained, a few survive in Khairi District in Uttar Pradesh, in the plains of North Bihar, and also in the Brahmaputra plains. The deltas of these northern rivers are clearly marked and extensive. They support back water estuarine swamps like the tidal swamps of Sunderbans and Mahanadi delta.

Check Your Progress 1

- 1) Name the three main geographical regions of India.

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- 2) Describe the geographical features of Gondwana.

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- 3) Mention those places where freshwater swamps survive even now.

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17.3 ECOLOGY OF INDIA

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 (*Embllica 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 *Erithrina 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 (*Banbusa 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. Cané (*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

Combined forces of environmental degradation have now endangered this rich biodiversity of India and threatened a thousand species of plants. Of these, 250 have been described in the Red Data Book of the Botanical Survey of India, 1987. There are, however, large tracts (Western Ghats, the North East and the Andaman Islands) where endemic species continue to grow and a few virgin forests still survive.

17.3.3 Fauna

India possesses an enormous wealth of fauna spread all over the subcontinent. It is estimated that nearly 40,000 species of insects, 2,000 of birds, and 500 of mammals exist in the country today. Add to this hundreds of species of reptiles and fishes and you have a truly mammoth census of fauna. A brief description of each of these in the following sub-sections will serve as a handy guide.

Insects: Among the animal species occurring in astronomical numbers are the insects. As many as 39,150 species have been listed so far and research is still in progress, describing at least one additional species each day. They occur in all habitat types and include beautiful butterflies and moths in the eastern part of the country and massive locusts in the western desert.

Reptiles: Ours is a country known for its variety of snakes. There are also some of the tribes, such as Kalbelia jogies and Irula, which are born herpatologists. Their favoured reptiles are cobras, rat snakes, sand boa and at times pythons. About 428 species of reptiles are found in India. Many of them are non-venomous and perform the useful function of controlling rodents. Only 50 species of snakes have poisonous fangs. Notable among them are cobras including the king cobra, kraits, vipers etc. There are 150 species of lizards and 30 species of turtles and tortoises. The nesting of the Green sea turtle *Chelonia mydas* off the beach of Balukhand Orissa where over 100,000 turtles (each laying 350-600 eggs) nest in December is a unique phenomenon. Three species of crocodiles—*esturian crocodile* (*Crocodylus porosus*), *marsh crocodile* (*Crocodylus pelistris*) and the *gavial* (*Gavialis gangeticus*) are the aquatic predators of estuaries, fresh water marshes and clean rivers respectively. All these make up the large group of reptiles of India.

Birds: There are over 2000 species of birds in India representing 20 of 27 orders of the avifauna of the world. Over 1,700 species, are residents of India and breed here. About 300 species, mostly water birds such as ducks, geese, teals, cranes and waders and a few land birds like the Imperial sand grouse, houbara, rosy pasters, starlings and sparrows come from the Palaearctic region of the Himalayas, Central and Northern Asia and Eastern and Northern Europe.

Large congregations of waterfowl are also seen in Bihar, Chilka lake of Orissa, Point Calimere in Tamil Nadu and Nalsarovar in Gujarat. Among the five nesting sites of the flamingos, the Great and the Little Rann of Kachh are on the world map where both the greater flamingos (*Phoenicopterus ruber*) and the lesser flamingos (*P. minor*) breed together. Notable heronaries are Keoladeo (Bharatpur), Sajonakholi (Sunderbans), Ranganathittu (near Mysore), and Vedanthangal (in Tamil Nadu) where thousands of storks, egrets and herons nest during the rains.

Partridges, quails and chukor (*Alectoris Chukar*) are prized upland game birds. The list below gives some of the beautiful and colour designed game birds:

- black partridge (*Francolinus francolinus*),
- painted grouse (*pteroceles indicus*),
- tragopans, (four species),
- gray jungle fowl (*Gallus varius*),
- painted spurfowl (*Galloperdix lunulata*),
- monal pheasants (*Lophophorus impejanus*).

The other colourful birds include bee-eaters, parakeets, rollers and wood peckers, king fishers, barbets, minvets and sunbirds. They are rich in metallic colours. The Indian roller (*Coracias benghalensis*) combines both metallic and pastel colours of the blues of the sky and



Kingfisher

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 Alaxander 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 (*Eudynamys scolopaces*) has a comparatively milder melody.

The peacock (*Pavo critatus*) 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 faciatus*), 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 (*Athene 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 (*Felia 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*).



Three species of mongoose are also common in India. These are the common mongoose (*Herpestes edwardsi*), small Indian mongoose (*H. auropunctatus*), and striped necked mongoose (*H. vitticollis*). The striped variety is the only species of hyena found in India. The wolf (*Canis lupus*), wild dog (dhole) (*Canis alpinus*), jackal (*C. aureus*) and a variety of foxes of the *Vulpus* genera (*V. bengalensis* and *V. vulpus*) are also effective predators. Four species of bears must be added to the list. The brown bear (*Ursus arctos*) is confined to north western Himalayas and the smaller Malayan sun bear (*Helarctos malayanus*) to the eastern Himalayas. The Himalayan black bear (*Selenarctos thibetanus*) is found throughout the mountain range. But the widest distribution from the foothills of the Himalayas is that of the sloth bear ranging through the country excluding the Himalayas and the desert. The red panda, also called the cat-bear (*Ailurus fulgens*), does not belong to the bear family but to the sub-family of racoons. There are ten species of the weasel family like the ratel (*Mellivora capensis*) and otter who are also constituents of the group of predators. There exist three species of otters, four species of masthins and weasels and three species of badgers. The insectivores include shrews, hedgehogs and moles. The bats are flying mammals and are represented by eleven extant species in India. The order of the primates consists of 14 species. Sadly, 11 of them, including the golden langur, (*Presbytis qeei*), and the lion tailed macaque, (*Macaca silenus*), are now endangered. India has only one ape — the hoolock, (*Hylobates hoolock*). The commonest of the primates are the common langur (*P. entellus*) and the rhesus macaque (*Macaca mulata* and *M. radiata*). The slow loris (*Nycticebus concang*) and slender loris (*Loris tardigradus*) are the clownish primate forms found in the north-east and in the western ghats.

The principal prey species for the predators are the antelopes and the deer. The four species of antelope seen in India include the Tibetan gazelle or chiru, black buck chinkara, (*Gazella gazella*), four horned antelope (*Tetracerus quadricornis*) and the nilgai (*Boselaphus tragocamelus*). Of the seven species of deer, hangul, (*Cervus elaphus hanglu*) in the north-west and thamin, (*Cervus eldi*), in the north-east, are endangered. Others like sambar (*Cervus unicorn*), chital (*Axis axis*), barking deer, (*muntiacus muntjak*) are common all over India. Musk deer (*Moschus moschiferus*) is confined to higher reaches of the Himalayas and the hog deer and swamp deer (*Cervus duvanceli*) in the Gangetic terai and Assam valley and a small population in Central India. Mouse deer (*Tragulus meminna*) is no deer. It is found in deciduous forests of the peninsula:

The wild boar is common but its miniature version, the pygmy hog, (*Sus salvanius - Hodgson*), is endangered and is confined to a few north-eastern grasslands. For smaller killers a hundred odd species of rodents provide the food base. The curious among them is the flying squirrel. There are no rabbits in India. Among hares, the hispid hare (*Caprolagus hispidus*), once thought to be extinct, is a miniature hare.

Wild cattle include the massive gaur (*Bas gaurus*) in woodlands, the wild buffalo, (*Bubalus bubalis*) in the tall grasslands of Assam, the banteng and the yak (*Bos mutus - Przewalski*) in the trans-Himalayas.

The Indian elephant (*Elephas maximus*), a different species to the African one, and the great Indian one-horned rhinoceros still exist in safer number of over 22,000 and 1,300 respectively. The Asiatic wild ass (*Equus hemionus*) and its Tibetan race, the kiang (*E.H. kiang*), dominate the hot and the cold deserts respectively. They have no predators except man.

Aquatic Animals: The blue whale (*Balaenoptera musculus*) and sperm whale, (*Physeter catodon*), common dolphin (*Delphinus delphis*), Gangetic dolphin, (*Platanista gangetica*) and the dugong (*Dugon dugon*) are mammals which live an aquatic life. They seem to have returned to a specialized way of life in water after they were evolved as terrestrial mammals. The dugong (sea cow) has given rise to stories about mermaids, a waiting wife will readily believe, however preposterous it may be!

Check Your Progress 2

- 1) What is the local name for India Silk Cotton tree?

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

- 3) Name three game birds:

17.4 ENVIRONMENTAL CONCERNS

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 retinues, 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.

The forest is a multifaceted, intricate living organism and balanced forestry entails a long-term management system. Wrong priorities and confused management can be disastrous and we are today not far from that sort of disaster situation. We have failed to convince our people, our political leadership, and our policy makers of hard facts. When we began 5,000 years ago, we might have had 80 per cent land area under forest cover, 20 per cent being deserts and geologically bad lands. According to the National Forest Policy statement of 1952, after we became a republic, we had 22 per cent of our land area under forests. We needed 11 per cent more to be self-sufficient in forest resources. Today, less than five decades later, thanks to satellite feedback, we know we have no less than 12 per cent of land under forests, out of which 4,000,000 hectares are just waste-lands. We have lost over 10 per cent of our recorded forests in a little over 40 years of freedom. The gap has become much wider with our failing to even retain existing forests.

17.4.2 Nature Conservation

Concern for nature conservation first began to build up in 1933, but began to gain momentum vigorously only in 1952. Yet, considering the gravity of the situation, it was too slow. In 1972 the Wildlife Protection Act was enforced. The Act helped to save the remaining wildlife of India. The Act would have remained another pious resolution if it had not been backed by special conservation measures like Project Tiger which not only brought back the Indian tiger from the brink of extinction but also by the example of its holistic eco-system approach, proved to be turning-point in conservation management in India. It saved the whole range of wildlife and the wide spectrum of biodiversity of India's habitat types. Some of India's tiger reserves are among our best national parks.

17.4.3 Wildlife Preservation

Can wildlife conservation become our priority subject? With a population of 900 million, increasing at the rate of a whole Australian population each year, will there be any space left for wild animals? Yet over 22,000 elephants and 4,000 tigers are still free in the Indian wild. They naturally, are supported by a wide range and sufficient natural food and prey populations respectively. No one has estimated the number of deer and antelopes in India, but their numbers are certainly in five figures in localized areas. There are over 20,000 chital in Palamau, 17,000 in Kanha, over 8,000 sambar in Ranthambore-Sariska, and 20,000 black buck in Rajasthan as a whole. There are over 268,000 common langur, 278,000 Rhesus and 174,000 Bonnet monkeys. Over 1,300 rhinoceroses also share their habitats with other wildlife. A statewide count of wildlife in Gujarat reveal that there are 161,000 pea fowl (and we can add another 300,000 freely roaming in Rajasthan) and an invasive migration of cranes, (161,000 demoiselle and common cranes) takes place during winter, each year. At Khichan in the Thar desert, 3000 to 4,000 demoiselle cranes land at one small place of less than 500 sq. m to feed, almost from hand, every day during the winter season.

What explains this seeming contradiction? The answer lies largely in the lingering endemic and developed culture of the people of India who still have compassion for fellow creatures and hold nature in reverence. There are religious sects, like the Bishnois of Western India who have adopted certain animals like black buck and gazelle for preservation. Those which enjoy perpetual protection from man in the name of religion include monkeys, revered as the incarnation of Hanuman and helpers of Lord Ram. Even our warm tropical climate helps us to stay vegetarian. Deplorable as poverty is, has also contributed to wildlife conservation, for not many can go out to shoot and hunt for pleasure. A law abiding attitude coupled with a respect for authority have also helped. But times have changed and conservation values have got discounted. Consequently, forests and wildlife have been wiped out from many tracts. Our hopes rest only on the Protected Areas — the 74 national parks and 450 sanctuaries, the latter a softer version of the former. They are administered by the States in which they are located but are centrally funded, guided and controlled. Some of them, like Nanda Devi, Keoladeo, Manas, Kaziranga and Sundarbans are World Natural Heritage sites, approved as such by the UNESCO. Others like Corbett, Sariska, Ranthambhore, Rann of Kutch, Gir, Anamalai, Bandhavgarh, Kanha, Simlipal and Andaman Islands are known for their natural beauty and rich biodiversity. Hopefully, they are protected for posterity.

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

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

17.7 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) Himalayas, Indo-Gangetic Plains, and the Peninsula
- 2) **Gondwana** is the peninsular region of India. For a description See Sub-sec. 17.2.1
- 3) Khairi District in Uttar Pradesh, the plains of North Bihar, and the Brahmaputra plains.

Check Your Progress 2

- 1) Semal
- 2) Night — *Kamodini*
Day — *Lotus*
- 3) Three game birds are: *Partridges, quails, chukor*

Check Your Progress 3

- 1) According to the National Forest Policy Statement of 1952 the respective figures were — 22% and 11%. See Sub-sec. 17.4.1
- 2) Keoladco, Kaziranga and Sunderbans Moccclam be found in Sub-sec. 17.4.3
- 3) National Parks : 74
Sanctuaries : 450



The Cat Family