



Biodiversity – National & Global Level Endangered & Endemic Species

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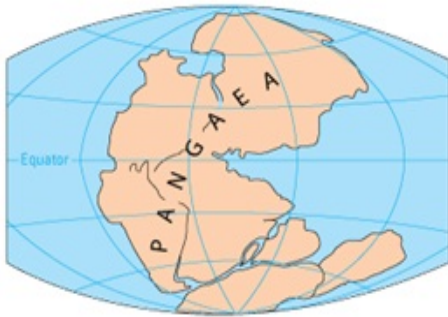
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Introduction

- **Known species** at present: **1.8 million**
- There might be present about **1.5 – 20 billion species** on earth.
- **Developing nations** – biodiversity rich (South).
- **Developed nations** - capable of exploiting biodiversity (North).
- Is biodiversity a '**global resource**'?
- '**Megadiversity nations**' – Brazil, Malaysia, Indonesia, India etc.
- **World Heritage Convention (UNESCO, 1972):**
 - Manas - Assam
 - Kaziranga - Assam
 - Bharatpur - Rajasthan
 - Nandadevi – Himalayas
 - Sunderbans - Ganges delta in West Bengal
- **Convention in Trade of Endangered Species (CITES, 1976)**

India - A Mega-diversity Nation

- **Geological events** responsible for high levels of biological diversity.
- **Pangea** – single land mass split (70 million years ago):
 - **Gondwanaland (Southern)** – India, Africa, Australia and Antarctic.
 - **Eurasian (Northern)**
- **Plate tectonic** movements shifted India northward across the equator to join **Eurasian continent**.
- **Tethis Sea** between them closed down.
- Plants and animals from **Europe, Far East, Africa and Ethiopia** migrated into India before Himalayas had formed.
- **India's special geographical position** between three distinctive centres of biological evolution and **radiation of species** is responsible for our rich and varied biodiversity.



PERMIAN
225 million years ago



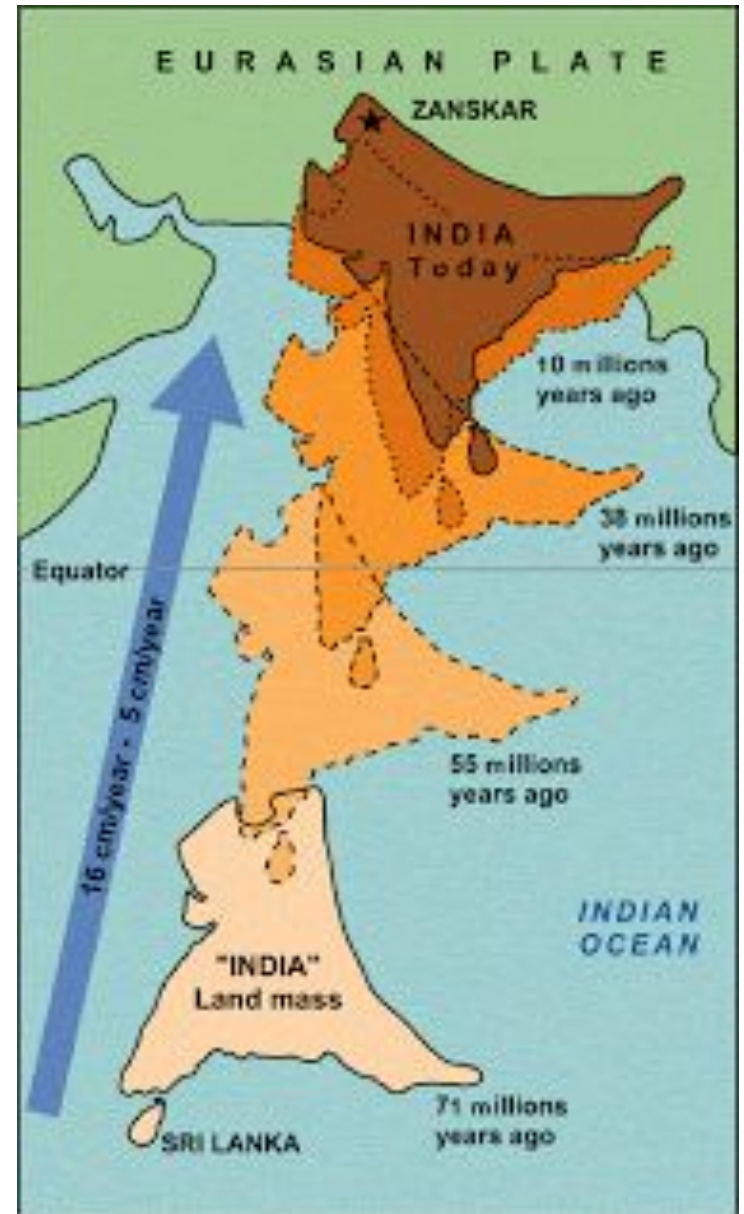
TRIASSIC
200 million years ago



JURASSIC
150 million years ago



CRETACEOUS
65 million years ago



https://youtu.be/A_K6LSSZ_3

INDIA AS MEGA DIVERSITY NATION

India is one of the 12 mega diversity countries in the world.

- **Australia**
- **Brazil**
- **China**
- **Columbia**
- **Ecuador**
- **The United States**
- **India**
- **Indonesia**
- **Madagascar**
- **Mexico**
- **Peru**
- **The democratic Republic of Congo**

Indian Species Diversity

	India's World Ranking	Number of species in India
Mammals	8th	350
Birds	8th	1200
Reptiles	5th	453
Amphibia	15th	182
Angiosperms	15th-20th	14,500

Global species diversity

Group	No. of Described Species
Bacteria and blue-green algae	4,760
Fungi	46,983
Algae	26,900
Bryophytes (Mosses and Liverworts)	17,000 (WCMC, 1988)
Gymnosperms (Conifers)	750 (Reven et al., 1986)
Angiosperms (Flowering plants)	250,000 (Reven et al., 1986)
Protozoans	30,800
Sponges	5,000
Corals and Jellyfish	9,000
Roundworms and earthworms	24,000
Crustaceans	38,000
Insects	751,000
other arthropods and minor Invertebrates	132,461
Molluscs	50,000
Starfish	6,100
Fishes (Teleosts)	19,056
Amphibians	4,184
Reptiles	6,300
Birds	9,198 (Clements, 1981)
Mammals	4,170 (Honacki et al., 1982)
<hr/>	
Total: 1,435,662 SPECIES	

From 'Conserving the World's Biological Diversity WRI, IUCN, CI, WWF-US, The World Bank.'

Endangered and Endemic Species of India

- **Endangered species** – species which are endangered by human activity.
- **Endemic species** – which are restricted to a particular place and not found anywhere else in the world.



One-Horned Rhinoceros



**Nilgiri Tahr
(Ende)**



Black Buck



**Asiatic Lion
(Ende)**



**Bengal
Tigers**



**Snow
Leopard**



**Lion Tailed Macaque
(Ende)**



**Great Indian Bustard
(Ende)**



**Kashmir Stag
(Hangul/Ende)**

SNOW LEOPARD



(Photo: G.S. Rawat)

The snow leopard is perhaps the most endangered of the large cats, with an estimated population of only 400 to 700 individuals in five Himalayan states in India. This species suffers from intense conflicts with rural communities, habitat degradation and depletion of natural prey base, poaching for its exquisite fur and valuable bones (used in traditional Chinese medicine). The state of Jammu & Kashmir has the distinction of harbouring a major portion of existing snow leopard population in India.

BUSTARD



(Photo: I.P. Bopanna)

The Bustards are an extremely endangered group of birds dependent on grassland ecosystems. Once upon a time, they used to occur in the arid, semi-arid and moist grasslands across the country. There are four species of Bustards in India Great Indian Bustard, Lesser Florican, Bengal Florican and Houbara Bustard. They are among the most threatened of the 22 Bustards found in the world. The Great Indian Bustard is now locally extinct from almost 90 per cent of its former range. The present population is estimated to be less than 1000 only. Similarly, perhaps, only less than 2500 Lesser Floricans survive in the whole world. The total global population of Bengal Florican could be between 400 to 500 individuals. The status of Houbara Bustard is also no more encouraging. These species have depleted, mainly due to the degradation of grasslands.

DOLPHIN



(Photo: Sandeep Behera)

The Gangetic or River Dolphin is one of the most endangered species found in the Ganges, Brahmaputra and their tributaries. They are the symbols of the ecological health of our major river systems. The emphasis on crocodiles, as the flagship species of the river systems has helped this species to some extent, but the waning of focused efforts of conservation have again resulted in their decline.

HANGUL



(Photo: Lalit Kumar Sharma)

Kashmir Stag or Hangul is one of the most critically endangered species found in the temperate grasslands of western Himalayas. Dachigam National Park in Kashmir represents one such grassland habitat that supports Hangul, a highly threatened and the only subspecies of the Red deer (*Cervus elaphus*) to be found in India, which is now confined only to the Kashmir Valley.

NILGIRI TAHR



(Photo: Bitapi C. Sinha)

Nilgiri Tahr, a mountain goat, is the highly threatened flagship species occur on the crest lines and ridge forests of the southern Western Ghats. The ideal habitat of this species is the rocky outcrops adjacent to the shola-grasslands and other ridge forests. Only less than 2000 individuals of this species is remaining in the wild in the whole world with the major population confined to Eravikulam National Park in Kerala and Grizzled Giant Squirrel Wildlife Sanctuary in Tamil Nadu.

DUGONGS



(Photo: Reefwatch)

Dugong (*Dugong dugon*) is the only herbivorous mammal that is strictly marine and the only member of the Order Sirenia found in India. Dugongs are restricted to coastal shallow marine habitats and grazes on the sea grass meadows in coastal waters and are therefore called as "Sea Cows". In India, it is one of the most seriously endangered species of large mammals. Dugongs are vulnerable to anthropogenic pressures as they are solely dependent on sea grasses in coastal areas, which now have been seriously damaged by mining, trawling etc. Dugongs have also been hunted for their meat, oil, hides, bones and teeth.

ASIAN WILD BUFFALO



(Photo: Bitapi C. Sinha)

The Asian wild buffalo (*Bubalus bubalis*) has been designated as endangered by the IUCN and included in Schedule I of the Wildlife (Protection) Act, 1972. The wild buffalo was once widely distributed over the tracts of tall grasslands and riverine forests in India and Nepal. The present population of wild buffalo in its entire range is estimated to be lower than 2,000 individuals.

BROW-ANTLERED DEER



(Photo: S.A. Hussain)

The Manipur brow-antlered deer, (*Cervus eldi eldi* McClelland 1842), popularly called 'Sangai' is a unique animal found only in Manipur in the whole world. The Sangai or the Manipur race of the *Elds* deer is the only deer which has adapted itself to the swampy habitat. The Sangai population dwindled rapidly in the beginning of 20 century under heavy hunting pressure and the continuous habitat destruction. In fact, the deer was considered almost extinct during 1950s.

VULTURES



(Photo: Pushp K. Jain)

Nine species of vultures are recorded from India of which five belong to the genus *Gyps*. Three *Gyps* vultures, namely the Oriental Rumped Vulture (ORV) *Gyps bengalensis*, Long-billed Vulture (LBV) *Gyps indicus* and Slender-billed Vulture (SBV) *Gyps tenuirostris* are residents, and the remaining two, the Eurasian Griffon Vulture *Gyps fulvus* and Himalayan Griffon Vulture *Gyps himalayensis* are largely wintering species. ORV and LBV were abundant across India until the 1990s. Vultures are nature's most efficient scavengers. The *Gyps* vultures are specialized to feed on the soft tissue of the large ungulate carcasses. They play a vital role in the ecosystem by cleaning up the rotten carcasses left in the open. The population of *Gyps* vultures in the Indian subcontinent has crashed since 1990s onwards. The populations of ORV, SBV and LBV had declined by around 97% during the last two decades. Veterinary use of the non-steroidal anti-inflammatory drug 'diclofenac' is the main cause attributed for this drastic population decline.

MALABAR CIVET



(Photo: Helmut Diles/WWF-India)

The Malabar large spotted civet (*Viverra civettina* Blyth, 1862) was once a common species in the coastal districts of Malabar and Travancore in southwest India in the low elevation moist forests of the Western Ghats. By the late 1950s it was reported to be almost 'extinct'. None were seen for a long period of time until 1987, when it was rediscovered about 60 km east of Calicut in Kerala. Extensive deforestation has reduced the Malabar civet's.

GREAT ONE-HORNED OR INDIAN RHINOCEROS



(Photo: Bitapi C. Sinha)

The great one-horned or Indian rhinoceros once existed across the entire northern part of the Indian subcontinent from Pakistan to the Indian-Burmese border, and including parts of Nepal and Bhutan. The species now exists only in a few small population units generally situated in the north-eastern India and in Nepal. The latest population estimation of the species shows that only less than 2,700 animals remain in the wild.

ASIATIC LION



(Photo: Mohd. Zahir)

The GIR forest, a dry deciduous forest ecosystem in the Saurashtra region of Gujarat, is the abode of the last surviving population of the free ranging Asiatic Lion (*Panthera leo persica*). The total distribution range of lion in this region is estimated to be around 9000 sq.km in three districts, i.e. Junagadh, Amreli and Bhavnagar, of which GIR National Park, GIR Wildlife Sanctuary, Paniya Wildlife Sanctuary and Mitiyal Wildlife Sanctuary account for about 1,193 sq.km. The conservation initiatives taken so far have resulted in arresting the trend of population decline of lions. As per the 2005 Census, the total population of Lion is 359+ 10, which includes 89 male, 124 female, 72 sub adult and 74 cubs.

SWAMP DEER



(Photo: Joseph Vattakaven)

The Swamp deer or Barasingha (*Cervus duvauceli*) were once abundant throughout the tall wet grasslands of the North Indian Terai region, the Brahmaputra flood plains, and the Central Indian grasslands bordering sal (*Shorea robusta*) forests. Currently, the swamp deer populations are confined to the States of Uttarakhand, Uttar Pradesh (*duvauceli*), Assam (*ranjitsinhii*) and Madhya Pradesh (*branderi*) in India. At present, the population estimates for the northwestern subspecies of swamp deer in India is about 1800-2400 individuals; for the northeastern subspecies is about 400-500 individuals; and the central subspecies is about 300 - 350 individuals. The Swamp deer has declined over the years, as a result of loss of habitat and biotic pressures over much of its former range. The Swamp deer habitats are threatened due to change in river dynamics and human developmental activities, increase in siltation, weed invasion, and reduced flow of water during critical periods of summer. Swamp deer is also threatened due to poaching for its meat, particularly the populations that occur outside PAs.

Endangered Plants



Amentotaxus assamica

(Assam)

This endangered plant species are present in Arunachal Pradesh, including Turoo hills, Dafla hills, and Delei valley. It is also found in the deciduous forest of Assam. It belongs to the coniferous tree group in India. This plant is also called as Assam catkin yew and is locally used for house construction.



Kingiodendron

sinuatum

This endangered plant species, commonly called Malabar Mahogany, is found in Kerala, Karnataka, and Tamil Nadu. This evergreen tree, which grows up to 30 meters tall, is best known for its wood. It grows at elevations up to 1000 meters. The balsam obtained from its trunk is used as a medicine to treat gonorrhoea as well as catarrhal conditions of respiratory and genito-urinary tracts.



*Ilex
khasiana*

This critically endangered plant species are found only in Shillong Peak in Meghalaya, where only four rare specimens are available. It grows up to 15-20 meters tall. The plant is so threatened because seed germination in nature happens very rarely and viable seeds have a prolonged stage of dormancy.



Cayratia pedata var.

This plant species is confined only to Tamil Nadu & Kerala states. It blooms only during the month of March to August. It is used to treat hysteria, diarrhea, and ulcer. It has got astringent properties.



Cycas

This endangered plant species is confined only to the Andhra Pradesh region. It blooms during the month of July to December. The male cones of this plant are used to cure muscle pain and rheumatoid arthritis in Ayurveda.



Decalepis

This endangered plant species are prevalent in peninsular India and grows along rocky slopes and crevices. This plant blooms during the month of August to May and also called Swallow root. It is well known for its antimicrobial, antioxidant, antidiabetic, anti-inflammatory, neuroprotective, hepatoprotective, cytoprotective, chemoprotective, and insecticidal properties. Housing, urban areas, roads, and railroads are destroying the plant's habitat.

2. *Lotus corniculatus*

Gujarat (rare)



12. *Nymphaea tetragona*

Jammu and Kashmir (endangered and threatened)



8. *Acacia planifrons*

Tamil Nadu (rare)



16. *Ceropegia odorata*

(endangered)



Plant	Also Known As	Region (Status)
<i>Polygala irregularis</i>	Milkwort	Gujarat (rare)
<i>Lotus corniculatus</i>	Bird's foot	Gujarat (rare)
<i>Amentotaxus assamica</i>	Assam catkin yew	Arunachal Pradesh (threatened)
<i>Psilotum nudum</i>	Moa, skeleton, fork fern, and whisk fern	Karnataka (rare)
<i>Diospyros celibica</i>	Ebony tree	Karnataka (threatened)
<i>Actinodaphne lawsonii</i>		Kerala (threatened)
<i>Acacia planifrons</i>	Umbrella tree, kudai vel (Tamil)	Tamil Nadu (rare)
<i>Abutilon indicum</i>	Indian mallow, thuthi (Tamil) and athibalaa (Sanskrit)	Tamil Nadu (rare)
<i>Chlorophytum tuberosum</i>	Musli	Tamil Nadu
<i>Chlorophytum malabaricum</i>	Malabar lily	Tamil Nadu (threatened)
<i>Nymphaea tetragona</i>		Jammu (endangered), Kashmir (threatened)
<i>Belosynapsis vivipara</i>	Spider wort	Madhya Pradesh (rare and endangered)
<i>Colchicum luteum</i>		Himachal Pradesh (rare and threatened)
<i>Pterospermum reticulatum</i>	Malayuram, Malavuram	Kerala (rare), Tamil Nadu (threatened)
<i>Ceropegia odorata</i>	Jeemikanda (Gujarat)	Gujarat, Melghat Tiger, Rajasthan, and Salsette Island, (endangered)

The 10 species which are considered highly endangered in the world are

1. Asian Elephant (India)
2. Bengal Florican (India)
3. The Great Indian Bustard (India)
4. Jaguar (Costa Rica, Argentina)
5. White Tip Shark (Brazil)
6. Little Bustard (European Union nations)
7. Urial (Tajikistan, Uzbekistan, Iran)
8. Antipodean Albatross (New Zealand, Australia, Chile)
9. Smooth Hammerhead Shark (Brazil)
10. Tope Shark (European Union Nations)

Sacred Groves

Sacred groves comprise of patches of forests or natural vegetation from a few trees to forests of several acres – that are usually dedicated to **local folk deities** (Example – *Ayyanar* and *Amman*) or **tree spirits** (*Vanadevatas*).

These spaces are **protected by local communities** because of their religious beliefs and traditional rituals that run through several generations.



In India 13,270 sacred groves are documented

Experts estimate is in the range of 100,000 – 150,000

Himachal Pradesh --- 5000

Karnataka --- 1424

Kerala --- 2000



**Names of sacred
groves**

State

Devara kadu

Karnataka

Deo Bhumi

Himachal Pradesh

Kovil Kadu

Pondcherry and TamilNadu

Kavus

Kerala

Devrais

Maharashtra

Mausmai

Megalaya

Bugyal

Uttaranchal

Machhiyal

Uttaranchal & H.P.

(sacred water bodies)

References

- http://www.wiienviis.nic.in/KidsCentre/EndangeredSpecies_8095.aspx



THANK YOU ALL