

Biodiversity Hotspots in India, List, Criteria, Importance, Threats

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Biodiversity Hotspots in India are regions with exceptionally rich biodiversity and a high number of **endemic plant and animal species** that are under serious threat from habitat loss. India is home to **four of the world's 36 biodiversity hotspots**, making these areas crucial for ecological balance and wildlife conservation.

Understanding their **list, criteria, importance, and threats** is essential for environmental awareness and competitive examinations.

What are Biodiversity Hotspots?

Biodiversity Hotspots are regions of the world that have an exceptionally high concentration of **endemic plant and animal species** and are under serious threat due to habitat loss and human activities. These areas are considered global priorities for conservation because they contain unique biodiversity that cannot be found anywhere else on Earth.

The concept of **Biodiversity Hotspots** was introduced by **Norman Myers** in **1988** and was later expanded by **Conservation International** to identify regions that require urgent protection.

Criteria for Biodiversity Hotspots

A region is recognized as a **Biodiversity Hotspot** only if it meets specific scientific criteria established by **Conservation International**. These criteria ensure that the area has both **exceptional biodiversity** and faces **serious threats**, making it a global conservation priority.

- Must contain at least **1,500 endemic vascular plant species**, representing **0.5% of the world’s total**.
- Must have lost at least **70% of its original natural vegetation** due to human activities or environmental changes.
- Should have **high species richness** with a large number of unique and endemic plants and animals.
- Must face **significant threats**, such as **deforestation, habitat fragmentation, climate change, urbanization, and pollution**.
- Requires **urgent conservation measures** to protect its unique ecosystems and endangered species.
- Plays a vital role in maintaining **ecological balance, genetic diversity, and ecosystem services**.

Biodiversity Hotspots in India

India is one of the **17 megadiverse countries** in the world and is home to **four of the world’s 36 Biodiversity Hotspots**. These hotspots support a rich variety of **endemic flora and fauna**, making them crucial for biodiversity conservation and ecological sustainability.

Biodiversity Hotspots in India			
Biodiversity Hotspot	Location in India	Major States/UTs Covered	Key Features
Himalaya	Northern India	Jammu & Kashmir (UT), Ladakh (UT), Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh, Northern West Bengal	Alpine meadows, temperate forests, glaciers, high endemism
Indo-Burma	Northeast India and Andaman Islands	Assam, Meghalaya, Manipur, Mizoram, Nagaland, Tripura, parts of Arunachal Pradesh, Andaman Islands	Tropical rainforests, wetlands, orchids, rich freshwater biodiversity
Western Ghats and Sri Lanka	Western Peninsular India	Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu	Evergreen forests, UNESCO World Heritage Sites, numerous endemic species
Sundaland	Nicobar Islands	Nicobar Islands (Andaman & Nicobar Islands)	Tropical rainforests, mangroves, coral reefs, island endemism

1. Himalaya Biodiversity Hotspot

The **Himalaya Biodiversity Hotspot** is one of the world's most biologically diverse regions, covering the **Indian Himalayan Region** and supporting thousands of unique plant and animal species. Its varied climate, altitude, and ecosystems make it a global priority for biodiversity conservation.

- Covers parts of **Jammu & Kashmir (UT), Ladakh (UT), Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh, and Northern West Bengal**.
- Extends across **India, Nepal, Bhutan, China (Tibet), Pakistan, and Myanmar**.
- Characterized by **alpine meadows, temperate forests, subtropical forests, glaciers, and snow-covered mountains**.
- Recognized for its **high level of endemic flora and fauna** due to diverse climatic and altitudinal zones.
- Serves as the source of major rivers, including the **Ganga, Brahmaputra, and Indus**.
- Rich in plant species such as **Rhododendron, Himalayan Yew, Deodar Cedar, Oak, Pine, Fir, Juniper, Birch, and Bamboo**.
- Home to iconic wildlife including the **Snow Leopard, Red Panda, Himalayan Musk Deer, Himalayan Tahr, Asiatic Black Bear, Blue Sheep (Bharal), Himalayan Monal, and Western Tragopan**.
- Includes important protected areas such as **Great Himalayan National Park, Valley of Flowers National Park, Nanda Devi National Park, Khangchendzonga National Park, and Namdapha National Park**.
- Plays a crucial role in **climate regulation, carbon storage, soil conservation, and freshwater supply**.
- Supports the livelihoods of millions through **agriculture, forestry, medicinal plants, and ecotourism**.

2. Indo-Burma Biodiversity Hotspot

The **Indo-Burma Biodiversity Hotspot** is one of the richest biodiversity regions in Asia, covering **Northeast India and the Andaman Islands**. It is renowned for its **tropical forests, exceptional species diversity, and high level of endemism**, making it a globally important conservation area.

- Covers **Northeast India** and the **Andaman Islands**, along with parts of Myanmar, Thailand, Cambodia, Laos, Vietnam, southern China, and Bangladesh.
- In India, it includes **Assam, Meghalaya, Manipur, Mizoram, Nagaland, Tripura, parts of Arunachal Pradesh, and the Andaman Islands**.
- Characterized by **tropical evergreen forests, moist deciduous forests, wetlands, grasslands, and extensive river systems**.
- Recognized for its **rich freshwater biodiversity** and one of the highest diversities of **orchids** in the world.
- Home to thousands of **endemic plant, bird, reptile, amphibian, and freshwater fish species**.
- Rich in flora such as **Bamboo, Orchids, Dipterocarp trees, Cane, Ferns, Magnolia, and Wild Banana**.
- Supports iconic wildlife including the **Hoolock Gibbon, Clouded Leopard, Asian Elephant, Bengal Tiger, Slow Loris, Hornbills, Gaur, and Bengal Florican**.
- Includes important protected areas such as **Kaziranga National Park, Manas National Park, Namdapha National Park, Dibru-Saikhowa National Park, Nokrek National Park, and Keibul Lamjao National Park**.

- Provides vital ecosystem services such as **water conservation, carbon storage, climate regulation, and pollination.**
- Supports the livelihoods of local and indigenous communities through **forestry, agriculture, fisheries, and ecotourism.**

3. Western Ghats Biodiversity Hotspot

The **Western Ghats Biodiversity Hotspot** is one of the world's **eight “hottest hotspots” of biological diversity** and stretches along the western coast of India. It is renowned for its **exceptional endemism, evergreen forests, and diverse ecosystems**, making it one of India's most important conservation regions.

- Extends across **Gujarat, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, and parts of southern India.**
- Runs parallel to the **Arabian Sea** for about **1,600 km**, covering approximately **160,000 sq. km.**
- Characterized by **tropical evergreen forests, moist deciduous forests, montane grasslands, shola forests, and river valleys.**
- Recognized as a **UNESCO World Heritage Site** for its outstanding biodiversity and ecological significance.
- Home to a large number of **endemic plants, amphibians, reptiles, birds, and mammals.**
- Acts as the origin of major peninsular rivers such as the **Godavari, Krishna, Kaveri, and Tungabhadra.**
- Rich in flora including **Sandalwood, Rosewood, Ebony, Wild Pepper, Cardamom, Myristica, Bamboo, and Teak.**
- Supports iconic wildlife such as the **Lion-tailed Macaque, Nilgiri Tahr, Nilgiri Langur, Malabar Giant Squirrel, Malabar Civet, Great Indian Hornbill, Purple Frog, Bengal Tiger, and Asian Elephant.**
- Includes major protected areas such as **Silent Valley National Park, Periyar National Park, Eravikulam National Park, Bandipur National Park, Nagarhole National Park, Anamalai Tiger Reserve, and Kudremukh National Park.**
- Plays a vital role in **water security, climate regulation, carbon sequestration, soil conservation, and hydropower generation.**
- Supports millions of people through **agriculture, plantations, forestry, medicinal plants, and ecotourism.**

4. Sundaland Biodiversity Hotspot

The **Sundaland Biodiversity Hotspot** is a globally important biodiversity region, with **India's Nicobar Islands** forming its only Indian component. It is known for its **tropical rainforests, mangroves, coral reefs, and high level of island endemism**, making it a critical area for biodiversity conservation.

- In India, the hotspot is represented only by the **Nicobar Islands** of the **Andaman and Nicobar Islands.**
- Extends beyond India to include **Indonesia (Sumatra, Java, Borneo, Bali), Brunei, Malaysia, Singapore, and southern Thailand.**
- Characterized by **tropical evergreen rainforests, mangrove forests, coastal ecosystems, coral reefs, and seagrass beds.**
- Supports a high number of **endemic plant and animal species** found only on the islands.

- Rich in flora such as **Pandanus, Mangroves, Coconut, Dipterocarp trees, Tropical hardwoods, and Coastal vegetation.**
- Home to unique wildlife including the **Nicobar Megapode, Nicobar Tree Shrew, Crab-eating Macaque, Saltwater Crocodile, Leatherback Sea Turtle, Green Sea Turtle, Dugong, and Nicobar Pigeon.**
- Includes important protected areas such as **Campbell Bay National Park, Galathea National Park, and the Great Nicobar Biosphere Reserve.**
- Plays a crucial role in **marine biodiversity conservation, coastal protection, carbon storage, and climate regulation.**
- Provides habitat for several **rare, endangered, and migratory species.**
- Supports the livelihoods of indigenous communities through **fisheries, forest resources, and sustainable tourism.**

Why are Biodiversity Hotspots Important?

Biodiversity Hotspots are among the most biologically rich regions on Earth and are essential for preserving **endemic species**, maintaining **ecological balance**, and supporting human well-being. Conserving these areas helps protect unique ecosystems while ensuring the sustainable use of natural resources.

- **Conserve Endemic Species:** Protect thousands of **plants and animals** found nowhere else in the world.
- **Maintain Ecological Balance:** Support healthy ecosystems by preserving **food chains, pollination, and nutrient cycling.**
- **Protect Endangered Wildlife:** Provide safe habitats for many **rare, threatened, and endangered species.**
- **Climate Regulation:** Forests in biodiversity hotspots act as **carbon sinks**, helping reduce the impacts of **climate change.**
- **Water Security:** Protect **watersheds**, rivers, and groundwater sources, ensuring a continuous supply of **freshwater.**
- **Support Livelihoods:** Provide **food, timber, medicinal plants, fuelwood, and other forest resources** to millions of people.
- **Promote Ecotourism:** Attract tourists and researchers, generating **employment** and supporting local economies.
- **Preserve Genetic Diversity:** Safeguard valuable **genetic resources** that are important for agriculture, medicine, and scientific research.
- **Reduce Natural Disasters:** Healthy forests help prevent **soil erosion, floods, landslides, and desertification.**
- **Ensure Sustainable Development:** Conserving biodiversity hotspots supports **environmental sustainability** and contributes to achieving the **Sustainable Development Goals (SDGs).**

Major Threats to Biodiversity Hotspots in India

India's **Biodiversity Hotspots** face increasing pressure from **human activities, climate change, and unsustainable resource use**, leading to habitat degradation and species decline. Addressing these threats is essential to protect the country's unique ecosystems and endemic biodiversity.

- **Deforestation:** Large-scale clearing of forests for **agriculture, infrastructure, and settlements** destroys natural habitats.
- **Habitat Fragmentation:** Construction of **roads, dams, railways, and urban projects** breaks continuous habitats into smaller patches, affecting wildlife movement.
- **Climate Change:** Rising temperatures, changing rainfall patterns, and extreme weather events alter ecosystems and threaten sensitive species.
- **Urbanization:** Rapid expansion of **cities and towns** leads to the loss of forests, wetlands, and other natural ecosystems.
- **Mining and Quarrying:** Extraction of **minerals and natural resources** damages forests, pollutes water bodies, and disturbs wildlife habitats.
- **Illegal Wildlife Trade:** Poaching and illegal trafficking of **plants and animals** threaten many endangered species.
- **Overexploitation of Natural Resources:** Excessive harvesting of **timber, fuelwood, medicinal plants, and non-timber forest products** depletes biodiversity.
- **Invasive Alien Species:** Non-native plants and animals compete with **native species**, disrupting ecological balance.
- **Pollution: Industrial waste, agricultural chemicals, plastic pollution, and untreated sewage** degrade soil, water, and air quality.
- **Forest Fires:** Frequent natural and human-induced fires destroy vegetation, reduce habitat quality, and threaten wildlife.
- **Unsustainable Tourism:** Poorly managed tourism increases **waste generation, habitat disturbance, and pressure on natural resources**.
- **Human-Wildlife Conflict:** Encroachment into forest areas results in increased conflicts between **people and wild animals**, threatening both livelihoods and wildlife conservation.

Conservation Efforts for Biodiversity Hotspots

Protecting **Biodiversity Hotspots** is essential for conserving **endemic species**, restoring ecosystems, and ensuring sustainable development. India has adopted several **legal, institutional, and community-based conservation measures** to safeguard these ecologically sensitive regions.

- Establishment of **National Parks, Wildlife Sanctuaries, Biosphere Reserves, and Conservation Reserves** to protect critical habitats.
- Implementation of the **Wildlife (Protection) Act, 1972** to conserve endangered species and regulate hunting and wildlife trade.
- Enforcement of the **Biological Diversity Act, 2002** to promote biodiversity conservation and the sustainable use of biological resources.
- Expansion of **Protected Area Networks** in ecologically important regions such as the **Western Ghats, Himalayas, Northeast India, and Nicobar Islands**.
- Launch of species-specific conservation programmes such as **Project Tiger, Project Elephant, Project Snow Leopard, and Project Dolphin**.
- Promotion of **afforestation, reforestation, and habitat restoration** to recover degraded ecosystems.
- Creation of **Eco-Sensitive Zones (ESZs)** around protected areas to minimize developmental pressures.

- Community participation through **Joint Forest Management (JFM)** and involvement of indigenous and local communities in conservation.
 - Strengthening measures to control **illegal wildlife trade, poaching, and deforestation** through improved monitoring and law enforcement.
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