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CUET · GEOGRAPHY · CLASS XI · CODE 313

Natural Vegetation

CUET unit: Natural Vegetation of India (Unit — India: Physical Environment)

By **UniDrill** · NCERT-grounded study material

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📌 Snapshot

- India's forests fall into **five major types** — Tropical Evergreen & Semi-Evergreen, Tropical Deciduous, Tropical Thorn, Montane, and Littoral & Swamp — each defined by climatic/rainfall thresholds.
- India's forest and wildlife conservation frameworks — the **Forest Policy (1952, modified 1988)**, the **Wildlife (Protection) Act, 1972**, **Biosphere Reserves** under UNESCO's MAB Programme, **Project Tiger (1973)** and **Project Elephant (1992)** — are all high-frequency CUET topics.
- Natural vegetation tracks climate variability across India, including the **altitudinal succession of Himalayan forests** from tropical to tundra.
- CUET frequently tests species-to-forest-type mapping, rainfall ranges, conservation statistics (number of National Parks, tiger reserves, Biosphere Reserves), and definitions such as Social Forestry, Agro-forestry, Community Forestry, Farm Forestry and Biosphere Reserve.
- British colonial policy converted India's forests from **protective to commercial** use (replacement of Garhwal/Kumaon oak with pine for railway sleepers; clearance for tea, rubber, coffee plantations).

📖 Detailed Notes

2.1 Core concepts

- **Natural vegetation defined**: a plant community that has been **left undisturbed over a long time**, so that its individual species adjust themselves to climate and soil conditions as fully as possible. Planted vegetation (orchards, gardens) is distinct because it grows under human supervision; the same tree may occur both wild and planted (NCERT §Intro, p. 42).
- India has a great variety of natural vegetation — **Himalayan heights**: temperate vegetation; **Western Ghats and Andaman & Nicobar Islands**: tropical rain forests; **deltaic regions**: tropical forests and mangroves; **desert and semi-desert Rajasthan**: cacti, bushes, thorny vegetation. Vegetation changes from one region to another with variations in climate and soil (NCERT §Intro, p. 42).
- **Five-fold classification (predominant vegetation type + climatic region)**: (i) Tropical Evergreen and Semi Evergreen forests; (ii) Tropical Deciduous forests; (iii)

Tropical Thorn forests; (iv) Montane forests; (v) Littoral and Swamp forests (NCERT §Types of Forests, p. 42).

- **Tropical Evergreen Forests** are found on the **western slope of the Western Ghats, hills of the north-eastern region and the Andaman & Nicobar Islands**, in warm and humid areas with annual precipitation **over 200 cm and mean annual temperature above 22° C**. They are **well stratified** — layers closer to the ground covered with shrubs and creepers, short-structured trees, then tall trees reaching **up to 60 m or above**. There is **no definite time** for trees to shed their leaves, flower or fruit, so the forests appear **green all the year round**. Species: **rosewood, mahogany, aini, ebony** (NCERT §Tropical Evergreen and Semi Evergreen Forests, p. 42).
- **Semi-Evergreen Forests** lie in the less rainy parts of the same regions and are a mixture of evergreen and moist-deciduous trees, with under-growing climbers providing an evergreen character. Main species: **white cedar, hollock, kail** (NCERT p. 42).
- **Colonial alteration of forest structure**: aware of the economic value of India's forests, the British began large-scale exploitation. The **oak forests of Garhwal and Kumaon were replaced by pine (chirs)** to lay railway lines. Forests were also cleared for plantations of **tea, rubber and coffee**, and timber was used in construction because it insulates heat. Thus the **protectional use of forests was replaced by commercial use** (NCERT p. 44).
- **Tropical Deciduous Forests** are the **most widespread forests in India** and are also called **monsoon forests**; they spread over regions receiving rainfall between **70–200 cm**. They are sub-divided on the basis of water availability:
- **Moist Deciduous** (rainfall **100–200 cm**) — found in the **north-eastern states along the foothills of the Himalayas, eastern slopes of the Western Ghats, and Odisha**. Main species: **teak, sal, shisham, hurra, mahua, amla, semul, kusum, sandalwood** (NCERT p. 44).
- **Dry Deciduous** (rainfall **70–100 cm**) — covers vast areas of the country; on the wetter margins it transitions to moist deciduous and on drier margins to thorn forests. Found in the **rainier areas of the Peninsula and the plains of Uttar Pradesh and Bihar**, often with a **parkland landscape** — teak and other trees interspersed with patches of grass. As the dry season begins, trees shed leaves completely and the forest looks like a grassland with naked trees. Common trees: **tendu, palas, amaltas, bel, khair, axlewood**. In western and southern Rajasthan vegetation is very scanty due to low rainfall and overgrazing (NCERT p. 44).
- **Tropical Thorn Forests** occur in areas receiving rainfall **less than 50 cm**, consisting of a variety of grasses and shrubs. Found in **semi-arid south-west Punjab, Haryana, Rajasthan, Gujarat, Madhya Pradesh and Uttar Pradesh**. Plants remain leafless for most of the year, giving an expression of scrub vegetation. Species: **babool, ber, wild date palm, khair, neem, khejri, palas**. **Tussocky grass grows up to a height of 2 m** as undergrowth (NCERT p. 44).

- **Montane Forests** — in mountainous areas, the decrease in temperature with increasing altitude leads to a corresponding change in vegetation; classified into **northern mountain forests** and **southern mountain forests** (NCERT p. 44).
- **Northern (Himalayan)** — show a succession of vegetation from **tropical to tundra** with altitude. **Foothills**: deciduous forests. **1,000–2,000 m**: **wet temperate** type forests with **oak and chestnut** predominant in the higher hill ranges of north-eastern India, hilly West Bengal and Uttaranchal (Uttarakhand). **1,500–1,750 m**: **pine forests** with **Chir Pine** as a very useful commercial tree. **Deodar**, a highly valued endemic species and a durable wood mainly used in construction, grows mainly in the **western part of the Himalayan range**; **chinar and walnut** of this zone sustain the famous **Kashmir handicrafts**. **2,225–3,048 m**: **blue pine and spruce**, with temperate grasslands in many places. **3,000–4,000 m**: transition to **Alpine** forests and pastures — **silver firs, junipers, pines, birch and rhododendrons**. These pastures are used extensively for **transhumance** by **Gujjars, Bakarwals, Bhotiyas and Gaddis**. Southern slopes carry thicker cover than the drier north-facing slopes because of higher precipitation. At higher altitudes, **mosses and lichens** form part of the **tundra vegetation** (NCERT pp. 44–45).
- **Southern Mountain Forests** — found in three distinct areas of Peninsular India — the **Western Ghats, the Vindhyas and the Nilgiris**. Being close to the tropics and only about **1,500 m above sea level**, vegetation is **temperate in higher regions** and **subtropical in lower regions** of the Western Ghats, especially in Kerala, Tamil Nadu and Karnataka. The temperate forests are called **Sholas** in the **Nilgiris, Anaimalai and Palani hills**. Economically significant species include **magnolia, laurel, cinchona, wattle**. Such forests are also found in the **Satpura and Maikal ranges** (NCERT p. 45).
- **Littoral and Swamp Forests / wetlands**: India has a rich variety of wetland habitats. About **70%** of this wetland area is under **paddy cultivation**. Total wetland area is **3.9 million hectares**. Two sites — **Chilika Lake (Odisha) and Keoladeo National Park (Bharatpur)** — are protected as water-fowl habitats under the **Ramsar Convention**. India's wetlands are grouped into **eight categories**: (i) reservoirs of the Deccan Plateau plus lagoons and wetlands of the southern west coast; (ii) vast saline expanses of Rajasthan, Gujarat and the Gulf of Kachchh; (iii) freshwater lakes and reservoirs from Gujarat eastwards through Rajasthan (Keoladeo NP) and Madhya Pradesh; (iv) delta wetlands and lagoons of India's east coast (Chilika Lake); (v) freshwater marshes of the Gangetic Plain; (vi) floodplains of the Brahmaputra and the marshes and swamps in the hills of north-east India and the Himalayan foothills; (vii) lakes and rivers of the montane region of Kashmir and Ladakh; (viii) mangrove forest and other wetlands of the island arcs of the Andaman and Nicobar Islands (NCERT pp. 45–46).
- **Mangroves** grow along coasts in salt marshes, tidal creeks, mud flats and estuaries; they consist of salt-tolerant species and are criss-crossed by creeks of stagnant water and tidal flows, sheltering a wide variety of birds. In India, mangrove forests

spread over **4,992 sq km — 7% of the world's mangrove forests**. Highly developed in the **Andaman & Nicobar Islands and the Sunderbans of West Bengal**; other significant areas are the **Mahanadi, Godavari and Krishna deltas** (NCERT pp. 45–46).

- **Forest Conservation Policy**: India adopted a forest policy in **1952**, modified in **1988**. Under the new policy the government emphasises **sustainable forest management**. The forest policy aims at: (i) bringing **33%** of the geographical area under forest cover; (ii) maintaining environmental stability and restoring forests where ecological balance has been disturbed; (iii) conserving the natural heritage, biological diversity and genetic pool; (iv) checking soil erosion, extension of desert lands, reduction of floods and droughts; (v) increasing forest cover through social forestry and afforestation on degraded land; (vi) increasing productivity of forests to make timber, fuel, fodder and food available to rural populations and to encourage substitution of wood; (vii) creating a massive people's movement involving women to encourage tree planting and reduce pressure on existing forest (NCERT §Forest Conservation, p. 46).
- **Social Forestry**: management and protection of forests and afforestation on barren lands for environmental, social and rural development. The **National Commission on Agriculture (1976)** classified social forestry into three categories:
- **Urban forestry** — raising and management of trees on public and privately owned lands in and around urban centres — green belts, parks, roadside avenues, industrial and commercial green belts.
- **Rural forestry** — promotion of **agro-forestry** (raising trees and agricultural crops on the same land, combining forestry with agriculture for simultaneous production of food, fodder, fuel, timber and fruit) and **community forestry** (raising trees on public/community land — village pasture, temple land, roadsides, canal banks, strips along railway lines, schools — benefiting the community as a whole and offering the landless a means of association in tree raising).
- **Farm forestry** — farmers grow trees for commercial and non-commercial purposes on their own farm lands. Forest departments distribute seedlings free to small and medium farmers; margins of fields, grasslands, pastures and land around homes and cow sheds can be used (NCERT §Social Forestry, pp. 46–47).
- **Wildlife of India**: about **4–5% of all known plant and animal species** on the earth are found in India because of great ecosystem diversity. Causes of wildlife decline: (i) industrial and technological advancement → rapid increase in exploitation of forest resources; (ii) land cleared for agriculture, human settlement, roads, mining, reservoirs; (iii) pressure on forests from lopping for fodder and fuelwood and removal of small timber by local people; (iv) grazing by domestic cattle adversely affects wildlife and habitat; (v) hunting taken up as sport by the elite (now commercial poaching is rampant); (vi) incidence of forest fire (NCERT §Wildlife, p. 47).

- **Wildlife (Protection) Act, 1972**: the main legal framework for conservation and protection of wildlife in India. Two main objectives: (i) protection to **endangered species listed in the schedule** of the Act, and (ii) legal support to conservation areas classified as **National Parks, sanctuaries and closed areas**. **Comprehensively amended in 1991** — punishments more stringent, with provisions for protection of specified plant species and conservation of endangered wild animals. India has **107 National Parks** and **573 wildlife sanctuaries** (NCERT §Wildlife Conservation in India, pp. 47–48).
- **Biosphere Reserves** are unique and representative ecosystems of terrestrial and coastal areas, internationally recognised under **UNESCO's Man and Biosphere (MAB) Programme**. They aim at three objectives: **Conservation** (biodiversity and ecosystem), **Development** (association of environment with development) and **Logistics** (international network for research and monitoring). India has **18 Biosphere Reserves**; **12** are on UNESCO's World Network (NCERT §Biosphere Reserves, p. 50).
- **Project Tiger (1973)**: launched to ensure maintenance of a viable tiger population in India for scientific, aesthetic, cultural and ecological values, and to preserve areas of biological importance. **Initially in 9 tiger reserves (16,339 sq km)**, now expanded to **58 tiger reserves covering 84,487 sq km in 18 states**. Tiger population rose from **1,411 (2006) to 3,682 (2023)** — more than **75% of the global tiger population** (NCERT §Project Tiger, p. 50).
- **Project Elephant (1992)**: launched to assist states with free-ranging populations of wild elephants and to ensure the long-term survival of identified viable populations in their natural habitat; implemented in **18 states**. Other projects: **Crocodile Breeding Project, Project Hangul** and conservation of the **Himalayan Musk deer** (NCERT §Project Elephant, p. 50).

2.2 Definitions to memorise

Term	Definition	Page
Natural vegetation	Plant community left undisturbed over a long time so that species adjust fully to climate and soil	42
Tropical Evergreen Forests	Dense, stratified forests in areas with annual rainfall > 200 cm and mean annual temperature > 22°C; no definite leaf-shedding season	42
Semi Evergreen Forests	Mixture of evergreen and moist-deciduous trees with under-growing climbers in less rainy parts of evergreen belt	42
Tropical Deciduous (Monsoon) Forests	Most widespread forests of India; rainfall 70–200 cm; trees shed leaves in dry season	44
Moist Deciduous	100–200 cm rainfall sub-type (teak, sal, shisham, sandalwood)	44
Dry Deciduous		44

Term	Definition	Page
	70–100 cm rainfall sub-type (tendu, palas, amaltas, bel, khair, axlewood)	
Tropical Thorn Forests	Scrub forests in areas with rainfall < 50 cm; tussocky grass up to 2 m undergrowth	44
Sholas	Temperate forests of the Nilgiris, Anaimalai and Palani hills	45
Chir Pine	Commercially useful pine of 1,500–1,750 m Himalayan belt	44
Deodar	Durable, endemic conifer of the western Himalayas, used in construction	44
Alpine forests	Silver fir/juniper/pine/birch/rhododendron between 3,000–4,000 m	45
Transhumance	Seasonal movement of pastoral communities (Gujjars, Bakarwals, Bhotiyas, Gaddis) with livestock between alpine pastures and lower valleys	45
Mangroves	Salt-tolerant forests along coasts in salt marshes, tidal creeks, mud flats and estuaries	45–46
Ramsar Convention	International convention on wetlands; protects Chilika Lake (Odisha) and Keoladeo NP (Bharatpur) as water-fowl habitats	45
Forest Policy 1952/1988	National forest policy aiming at 33% area under forest, sustainable management, social forestry	46
Social Forestry	Management and protection of forests and afforestation on barren lands for environmental, social and rural development	46
Urban forestry	Trees on public/private lands in and around urban centres — green belts, parks, roadside avenues	47
Agro-forestry	Raising trees and agricultural crops together on the same land	47
Community forestry	Raising trees on public/community land — village pasture, temple land, roadsides, canal banks, railway strips	47
Farm forestry	Farmers growing trees for commercial and non-commercial purposes on their farm lands	47
Wildlife (Protection) Act 1972	Main legal framework for wildlife conservation; protects endangered species and conservation areas; amended 1991	47
Biosphere Reserve	Unique, representative ecosystem internationally recognised under UNESCO MAB; three objectives — Conservation, Development, Logistics	50
Project Tiger	Scheme launched in 1973 to conserve tigers; 58 reserves over 84,487 sq km in 18 states	50
Project Elephant	Scheme launched in 1992 to assist states with wild elephant populations; implemented in 18 states	50

Term	Definition	Page
MAB Programme	UNESCO's Man and Biosphere Programme, the framework for Biosphere Reserves	50

2.3 Diagrams / processes to remember

- **Figure 5.1 (p. 42)** — Photograph of Evergreen Forest; shows the dense, multi-layered, year-round green canopy characteristic of the Western Ghats / Andamans / north-east type.
- **Figure 5.2 (p. 43)** — Natural Vegetation map of India. A single map showing five legend classes — Littoral & Swamp Forest (small east-coast patches), Montane Forest (Himalayan rim and Vindhya/Satpura/Nilgiri belt), Tropical Thorn Forest (NW India), Tropical Deciduous Forests (dominant block across the Peninsula and Ganga plain), and Tropical Evergreen & Semi-Evergreen Forests (Western Ghats western slopes, north-east, Andaman & Nicobar). **Essential for map-based MCQs**.
- **Figures 5.3, 5.4, 5.5, 5.6 (pp. 44–46)** — Photographs of Deciduous Forest, Tropical Thorn Forest, Montane Forest and Mangrove Forest respectively, helping students visually associate each type with its species composition.
- **Figure 5.7 (p. 48)** — Photograph of Elephants in their natural habitat; supports the Project Elephant section.
- **Figure 5.8 (p. 49)** — India: Biosphere Reserves map. Plots Nanda Devi, Dehang Debang, Khangchendzonga, Dibru-Saikhowa, Manas, Nokrek, Pachmarhi, Achanakmar-Amarkantak, Similipal, Sunderbans, Nilgiri, Agasthyamalai, Gulf of Mannar and Great Nicobar — students should be able to locate each on the outline map.
- **Figure 5.9 (p. 50)** — Objectives of a Biosphere Reserve. Triangular schematic with three nodes: **Conservation** (of biodiversity and ecosystem), **Development** (association of environment with development), **Logistics** (international network for research and monitoring). A frequent CUET target.
- **Altitudinal succession in Himalayan forests (mental sequence)**: Foothills → 1,000–2,000 m wet temperate (oak, chestnut) → 1,500–1,750 m pine (Chir Pine, Deodar in west) → 2,225–3,048 m blue pine, spruce, temperate grasslands → 3,000–4,000 m Alpine (silver fir, juniper, birch, rhododendron) → higher altitudes mosses, lichens (tundra).
- **Process flow — Forest Policy**: 1952 adoption → 1988 modification → sustainable forest management → seven aims (33% target, environmental stability, biodiversity conservation, soil-erosion check, social forestry, productivity for rural needs, mass people's movement).

2.5 Key data table (NCERT figures from this chapter)

#	Item	NCERT figure	Page
1	Number of forest types in India	5	42
2	Tropical Evergreen — rainfall threshold	> 200 cm	42
3	Tropical Evergreen — mean temperature	> 22°C	42
4	Tropical Evergreen — tree height	Up to 60 m or above	42
5	Tropical Deciduous — rainfall range	70–200 cm	44
6	Moist Deciduous — rainfall range	100–200 cm	44
7	Dry Deciduous — rainfall range	70–100 cm	44
8	Tropical Thorn — rainfall threshold	< 50 cm	44
9	Thorn forest tussocky grass height	Up to 2 m	44
10	Himalayan wet temperate belt	1,000–2,000 m	44
11	Himalayan pine belt	1,500–1,750 m	44
12	Blue pine & spruce belt	2,225–3,048 m	45
13	Alpine belt	3,000–4,000 m	45
14	India's total wetland area	3.9 million hectares	45
15	Share of wetland under paddy	About 70%	45
16	India's mangrove cover	4,992 sq km = 7% of world	46
17	Forest Policy — target forest area	33% of geographical area	46
18	National Parks & Sanctuaries	107 NPs; 573 sanctuaries	48
19	Biosphere Reserves — India / UNESCO	18 / 12	50
20	Project Tiger — initial vs current	9 reserves / 16,339 sq km (1973) → 58 reserves / 84,487 sq km, 18 states	50
21	Tiger population growth	1,411 (2006) → 3,682 (2023) — > 75% of global	50

#	Item	NCERT figure	Page
22	Project Elephant — year & state count	Launched 1992; 18 states	50
23	Wildlife Act enactment & amendment	1972 (amended 1991)	47–48
24	National Commission on Agriculture	1976 (classified social forestry)	46

2.4 Common confusions / NTA trap points

- **Sandalwood is a Deciduous-forest species (Moist Deciduous), not Evergreen**. NCERT places sandalwood in the Moist Deciduous list (p. 44); NTA Exercise Q1-i tests this directly — the answer is Deciduous.
- **Rainfall ranges — overlapping boundaries**: Moist Deciduous 100–200 cm; Dry Deciduous 70–100 cm; combined Tropical Deciduous 70–200 cm; Thorn < 50 cm; Evergreen > 200 cm. Students mix up the sub-type thresholds; NTA exploits this with close distractors.
- **18 vs 12 Biosphere Reserves** — India has **18 Biosphere Reserves total** but only **12** are on UNESCO's World Network. NTA frequently uses both numbers as distractors.
- **Project Tiger launch year**: **1973** — not 1972 (which is the Wildlife Act year). The proximity is a classic trap.
- **Project Elephant launch year**: **1992** — not 1972 or 1973. It is implemented in 18 states.
- **Deodar vs Chir Pine**: Deodar grows mainly in the **western part of the Himalayan range**; Chir Pine is the commercial pine of the **1,500–1,750 m** zone — students confuse their altitudinal/geographic domains.
- **Sholas** are the **temperate forests of the Nilgiris/Anaimalai/Palani** — they are the southern, not Himalayan, equivalent.
- **Tropical evergreen forests have no definite leaf-shedding season** — a common trap option claims they shed leaves in summer. The right point is that flowering, fruiting and shedding happen throughout the year, so they look green year-round.
- **Mangroves in India = 4,992 sq km = 7% of world** — the "7%" figure is often inverted to suggest India has 70% of the world's mangroves; that is wrong.
- **Initial Project Tiger reserves = 9** with **16,339 sq km**; current = **58 reserves / 84,487 sq km / 18 states**. Inversion of the initial/current numbers is a frequent trap.
- **Forest Policy 1952 was modified in 1988** — not 1972 or 1980; the **33%** target is the standard NCERT figure (40% in hills, 33% nationwide is the policy aim discussed in some texts, but NCERT here gives the **33% headline target**).

- **Wildlife (Protection) Act amended in 1991** — not 1988; the amendment made punishments more stringent and added protection for specified plant species.
- **Eight wetland categories** — not five or ten; the Brahmaputra and Gangetic-marshes appear as separate categories, not bundled.
- **Tribes practising transhumance in the Himalayas — Gujjars, Bakarwals, Bhotiyas, Gaddis** — not Bhils or Santhals, which are central/eastern tribal groups.

🎯 Practice MCQs

📊 PYQ Alignment

This chapter appears consistently in CUET Geography papers, with questions drawn from the **classification of forest types** (species-to-forest-matching), **conservation statistics** (Biosphere Reserves count, tiger reserves, Forest Policy target), and **definitions** of Social Forestry, Agro-forestry, Community/Farm Forestry and Biosphere Reserves. Map-based questions identifying mangrove regions or Biosphere Reserve locations are also common. For drill sets and previous-year analyses see /pyq/geography.