FREE NOTES · NCERT + NEET LEVEL

Biodiversity & Conservation

Biodiversity ke levels, dharti aur Bharat me species, patterns (latitudinal gradients, species–area relationship), species diversity ka mahatva, biodiversity ka nuksaan aur kaaran, aur in situ aur ex situ conservation.

01 Biodiversity ke levels
02 Kitni species?
03 Biodiversity ke patterns
04 Species diversity ka mahatva
05 Biodiversity ka nuksaan
06 Biodiversity conservation
07 Extra + tricks
08 Important Q&A
09 Common mistakes
10 Practice (NEET style)
11 Quick revision

01 Biodiversity ke levels

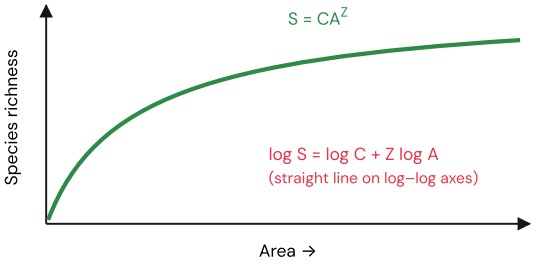
- Shabd **Edward Wilson** ne mashhoor kiya.
- **Genetic diversity**: ek species ke andar; jaise Himalaya ki *Rauwolfia vomitoria* me reserpine ki taakat alag; Bharat me chawal ki 50,000+ strains, aam ki 1000+ kismein.
- **Species diversity**: Western Ghats me Eastern Ghats se zyada amphibian species.
- **Ecological diversity**: Bharat (registaan, rain forests, mangroves, coral reefs, wetlands, estuaries, alpine meadows) Scandinavia se zyada.

02 Kitni species?

- IUCN (2004): ~15 lakh species varnit. Robert May ka anumaan: ~**70 lakh**.
- 70% se zyada recorded species jaanwar; paudhe (algae, fungi, bryophytes, gymnosperms, angiosperms) ≤ 22%. Jaanwaron me sabse zyada insects (>70%: 10 me se 7). Fungi species saare vertebrates se zyada.
- Bharat: duniya ki 2.4% zameen par **8.1%** species diversity; 12 **mega diversity** deshon me; ~45,000 paudhe aur do guna jaanwar recorded. Anumaanit kul ~1,00,000 paudhe aur 3,00,000 jaanwar.

03 Biodiversity ke patterns

- **Latitudinal gradient**: equator se poles ki taraf diversity kam; tropics (23.5° N–23.5° S) sabse ameer. Colombia (equator ke paas) ~1400 pakshi species; New York (41° N) 105; Greenland (71° N) 56. Amazon: 40,000+ paudhe, 3000 machhli, 1300 pakshi, 427 mammals, 427 amphibians, 378 reptiles, 1,25,000+ invertebrates.
- Tropics ameer kyun: evolution ke liye zyada samay (glaciation nahi), kam mausami badlav, sthir mahaul, zyada dhoop ⇒ zyada productivity.
- **Species–area relationship** (Alexander von Humboldt): area ke saath richness ek seema tak badhti. log S = log C + Z log A. Z 0.1–0.2 zyada tar; bahut bade area (mahadweep) 0.6–1.2; tropical jungle ke phal khane wale pakshi, mammals ~1.15.



Species–area relationship

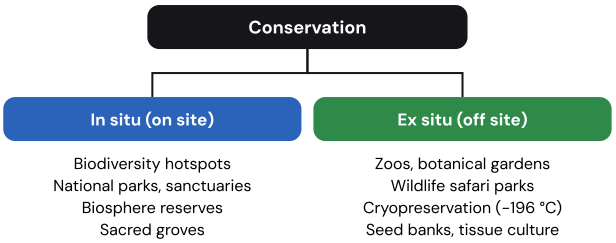
04 Species diversity ka mahatva

- **David Tilman**: zyada species wale plots me saal-dar-saal biomass me kam badlav aur zyada productivity: diversity se stability.
- **Rivet popper hypothesis** (Paul Ehrlich): ecosystem = hawai jahaz, species = rivets; kuch nikle to shayad farak nahi, par zaroori (pankh wale) nikle to khatra.
- Bachane ke kaaran: **narrowly utilitarian** (khana, lakdi, fibre, dawa; **bioprospecting**: >25% dawaein paudhon se; 25,000 species paramparik ilaaj me), **broadly utilitarian** (ecosystem services: Amazon dharti ki ~20% O_2; pollination; sundarta), **ethical** (har species ka apna mol; naitik farz).

05 Biodiversity ka nuksaan

- IUCN Red List (2004): pichhle 500 saal me 784 vilupt (338 vertebrates, 359 invertebrates, 87 paudhe), jaise dodo (Mauritius), quagga (Africa), thylacine (Australia), Steller's sea cow (Russia), Bali, Javan, Caspian baagh. Pichhle 20 saal me 27 species. 12% pakshi, 23% mammals, 32% amphibians, 31% gymnosperms khatre me. Aaj ki rate insaan se pehle se 100–1000 guna tez; **chhatha mass extinction** chal raha.
- Asar: paudhon ka utpaadan kam, resilience kam, productivity me utaar-chadhaav, ecosystem processes badalna. **Co-extinctions**: host machhli khatam ⇒ uske khaas parasites bhi.
- **Kaaran ("The Evil Quartet")**: (1) **habitat loss aur fragmentation** (sabse bada; tropical rain forests pehle 14% zameen, ab 6%; Amazon "dharti ke fefde" soybean, maveshi ke liye kata); (2) **over-exploitation** (Steller's sea cow, passenger pigeon; samudri machhli zyada pakdi); (3) **alien species** (Lake Victoria me Nile perch se 200+ cichlid species khatam; *Parthenium*, *Lantana*, jalkumbhi *Eichhornia*; African catfish *Clarias gariepinus* desi catfish ko khatra); (4) **co-extinctions**.

06 Biodiversity conservation

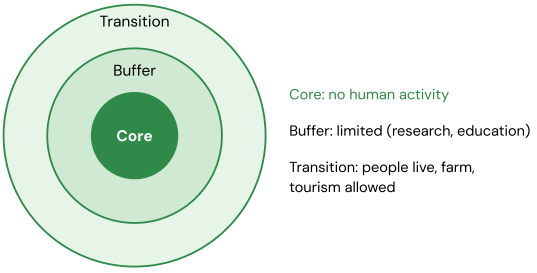


Conservation ke tareeke

- **Biodiversity hotspots** (Norman Myers): zyada species, zyada endemism, khatre me; duniya me 34 (<2% zameen; vilupti 30% tak kam). Bharat me 3: **Western Ghats aur Sri Lanka**, **Indo-Burma**, **Himalaya**.
- Bharat: 14 biosphere reserves, 90 national parks, 448 wildlife sanctuaries (NCERT ke anusaar). **Sacred groves**: Khasi aur Jaintia Hills (Meghalaya), Aravalli (Rajasthan), Western Ghats (Karnataka, Maharashtra), Sarguja, Chanda, Bastar (MP/Chhattisgarh).
- Ex situ: gametes ka cryopreservation (lambe samay tak fertile), in vitro fertilisation, tissue culture, seed banks.
- Antarrashtriya: **Earth Summit** (Rio de Janeiro, 1992; Convention on Biological Diversity); **World Summit on Sustainable Development** (Johannesburg, 2002): 190 deshon ne 2010 tak biodiversity loss kam karne ka vaada.

07 Extra + tricks

- **Red Data Book / IUCN Red List**: khatre wali species ki categories: extinct, extinct in the wild, critically endangered, endangered, vulnerable, near threatened, least concern.
- **Endemism**: sirf ek ilaake me milne wali species (Western Ghats me kai).
- **Ramsar Convention** (1971): wetlands ka sanrakshan.
- Biosphere reserve zones: core, buffer, transition (figure).
- Bharat ke hotspots ka trick: **"W-I-H"** = Western Ghats–Sri Lanka, Indo-Burma, Himalaya.



Biosphere reserve ke zones

08 Important Q&A

Q1. Biodiversity loss ke chaar kaaran (Evil Quartet)?

Habitat loss aur fragmentation, over-exploitation, alien species, co-extinctions.

Q2. Rivet popper hypothesis samjhao.

Ehrlich ne ecosystem ko hawai jahaz aur species ko rivets kaha; kuch rivets nikalna theek par zaroori (pankh wale) nikle to jahaz (ecosystem) gir sakta.

Q3. Tropics zyada biodiverse kyun?

Bina rukaavat lamba evolutionary samay, kam mausami aur sthir mahaul, zyada dhoop aur productivity.

09 Common mistakes

- Bharat me 4 hotspots kehna (3 hain).
- Zoo ko in situ kehna (ex situ).
- Over-exploitation ko sabse bada kaaran likhna (habitat loss hai).
- Tilman (stability) aur Ehrlich (rivet popper) mix karna.

10 Practice (NEET style)

1. Biodiversity shabd kisne mashhoor kiya?
2. Duniya ki species diversity me Bharat?
3. Lake Victoria me cichlids khatam karne wali machhli?
4. Zyada tar areas me Z?
5. Earth Summit kab, kahan?

ANSWERS

1) Edward Wilson · 2) 8.1% · 3) Nile perch · 4) 0.1–0.2 · 5) 1992, Rio de Janeiro

11 Quick revision: exam se 5 minute pehle

LEVELS

- Genetic, species, ecological
- Edward Wilson
- Bharat 8.1%, mega diverse

PATTERNS

- Tropics sabse ameer
- $S = CA^Z$, Z 0.1–0.2
- Humboldt

LOSS

- Evil Quartet
- Nile perch, Parthenium
- Dodo, quagga, thylacine

CONSERVATION

- Bharat me 3 hotspots
- In situ: parks, sacred groves
- Ex situ: zoo, cryopreservation

Koi doubt? padhaiadda.netlify.app pe AI Doubt Solver se poocho, ya is chapter ka mock test do.