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ENVIRONMENT



PRELIMS 2026



COVERAGE JUNE 2025 TO FEB2026

This file has month wise CA in compiled format.

All memory tricks , static value addition is done by expert faculty ANKITA MAAM in classes on youtube. DO NOT MISS THEM .

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TOPICS COVERED-

- **Fossil Leaves Discovery in Assam** – 24-million-year-old Nothofagus leaves reveal NE India's tropical past and plant migration to Western Ghats.
- **Monsoon Impact on Marine Productivity** – Extreme monsoons reduce nutrient upwelling in Bay of Bengal, affecting plankton and fisheries.
- **MSC ELSA 3 Sinking, Kerala** – Liberian ship sinks off Kerala, causing oil, chemical, and plastic pollution; legal action under MARPOL/SOLAS.
- **Plastic Pollution from EV Tyres** – Heavier EVs release ultrafine plastic particles (1–10 µm) from tyres, not covered under PM2.5/PM10 norms.
- **Methane Emissions & India's Stance** – India avoids COP26 Global Methane Pledge due to “survival emissions” but pursues domestic mitigation programs.
- **India Boosts Reservoir Capacity in Indus System** – Maintenance at Baglihar & Salal dams increases storage and reduces downstream flow to Pakistan.
- **Upper Bhavani Pumped Storage Project** – 1000 MW Tamil Nadu project for peak-hour electricity near Nilgiris biodiversity hotspot.
- **Siang Upper Multipurpose Project** – 11,000 MW Arunachal dam aims at flood control and hydropower amid China's upstream projects.
- **Hydrogen Fuel Cell Vehicles (HFCVs)** – Hydrogen-powered vehicles offer zero emissions, long range, and quick refueling; India promotes via National Green Hydrogen Mission.
- **Black Headed Caterpillar Disease** – Coconut pest (Opisina arenosella) reduces photosynthesis; controlled via biopesticides and predators.
- **Botrytis Fungi (Noble Rot)** – Fungus infects grapes, increasing sugar for sweet wine; releases oxalic acid to decompose plant tissue.
- **Similipal Tiger Reserve** – Odisha reserve blends Western/Eastern Ghats & Himalayan biodiversity; uses AI for anti-poaching.
- **Muscle Fiber Formation (Myogenesis)** – Myoblasts form muscle fibers during fetal growth and repair; regulated by Myf5 & MyoD proteins.
- **IBAT Alliance** – Global coalition providing biodiversity data (WDPA, KBAs, IUCN Red List) for conservation and corporate decisions.
- **Kappatagudda Wildlife Sanctuary** – Northern Western Ghats sanctuary with dry deciduous forests, grasslands, and heritage temples; now an Eco-Sensitive Zone.
- **International Potato Centre & India** – CIP maintains potato gene bank; India is 2nd largest producer, mainly in Indo-Gangetic plains.
- **WMO Report on Asia's Climate 2024** – Asia's 2nd warmest year, warming twice as fast as global average with record sea-surface temperatures.
- **Himalayan Brown Bear** – Critically endangered high-altitude bear in India & neighboring countries; habitat loss is main threat.

- **Nano Fertilizers** – Advanced controlled-release fertilizers improve nutrient absorption, reduce wastage, and promote sustainable agriculture.
- **Giant African Snail** – Invasive snail in India (Kerala) causing crop damage and human health risk (Eosinophilic meningitis).
- **Gambusia affinis** – Mosquito-control fish introduced to India; outcompetes native species and disrupts biodiversity.
- **Guppies** – Small invasive fish used for mosquito control; serves as a model organism in ecology and evolution.
- **Russell's Viper** – Highly venomous snake; research on inhibitors (varespladib, marimastat) complements polyvalent antivenom treatment.
- **Rinderpest** – Viral cattle disease eradicated globally (2011); ICAR-NIHSAD Bhopal is Category A holding facility.
- **Biotechnology Policy (BioE3)** – Promotes high-performance biomanufacturing and aims for \$300 billion bioeconomy by 2030.
- **Agroforestry in India** – Integrating trees with crops increases yield, carbon sequestration, and ecosystem sustainability; Model Rules 2025 guide implementation.
- **ICDRI & Coastal Resilience** – India-led global initiative addressing coastal vulnerabilities via disaster-resilient infrastructure.
- **Crowd Disaster Management / Stampedes** – Planning and real-time monitoring prevent casualties during mass gatherings.
- **Bharat Forecast System (BFS)** – India's high-resolution weather system enabling village-level forecasts and disaster management.
- **ILO Convention on Biological Hazards at Work** – First international convention to protect workers from biological hazards.
- **State and Trends of Carbon Pricing 2025** – Rapid growth of global carbon pricing; India develops compliance & offset mechanisms.
- **National Mission for a Green India (GIM)** – Aims to increase forest/tree cover and create carbon sinks with community participation.
- **Global Drought Outlook 2025** – 40% of global land faces severe droughts affecting crops, hydropower, and water supply.
- **Global Ocean Darkening** – Reduced light penetration threatens marine photosynthesis, fisheries, and carbon absorption.
- **3rd UN Ocean Conference (UNOC3)** – Reinforces SDG 14, tackling climate change, biodiversity loss, and marine pollution.
- **New Ramsar Sites in Rajasthan** – Khichan & Menar wetlands protect migratory birds and critically endangered species.
- **Greater Flamingo Sanctuary, Tamil Nadu** – Protects migratory flamingos along Central Asian Flyway at Dhanushkodi.
- **Energy Transition Index (ETI) 2025** – India ranked 71st, indicating slower progress in transition to clean energy.
- **Thirstwave** – Consecutive days of extreme atmospheric water demand affecting agriculture and water management.
- **Salkhan Fossil Park, UP** – Precambrian stromatolites (~1.4 billion years) show early Earth oxygenation; on UNESCO tentative list.
- **Biopesticide for Cardamom Thrips** – ICAR-IISR develops eco-friendly fungus-based solution reducing chemical use.

- **Food Crops & Ethanol-Blending Programme** – Uses sugarcane, rice, maize for ethanol; raises food security concerns.
- **Avian Influenza (H5N1)** – Highly contagious bird virus with potential human infection; global trade and health concern.
- **Siang Upper Multipurpose Project (SUMP)** – Largest Indian dam (11.2 GW) for hydropower and flood control; social & environmental concerns.
- **Sponge Parks in India** – Urban green infrastructure to absorb rainwater, recharge groundwater, and prevent flooding.



ENVIRONMENT AND DISASTER MGT

Source – PIB

A 24-million-year-old secret unearthed by fossil leaves discovery in Assam

Recent Context :

Fossil leaves of *Nothopegia* (~24–23 million years old) discovered in Makum Coalfield, Assam, reveal Northeast India's tropical past, climate shifts due to Himalayan uplift, and migration patterns toward the Western Ghats.

Prelims Pointers:

1. **Location:** Makum Coalfield, Assam – site of Late Oligocene fossil discovery.
2. **Species:** Fossil leaves identified as genus *Nothopegia*, now found only in Western Ghats.
3. **Dating:** Fossils ~24–23 million years old (Late Oligocene).
4. **Scientific Study:** Conducted by Birbal Sahni Institute of Palaeosciences (BSIP), Lucknow using herbarium comparison, cluster analysis, CLAMP.
5. **Climatic Insight:** Northeast India was once warm and humid; Himalayan uplift caused cooler, drier conditions.
6. **Ecological Significance:** Fossil evidence shows plant migration and survival patterns; highlights Western Ghats as ancient biodiversity refuge.
7. **Conservation Message:** Study warns of rapid, human-driven biodiversity loss; emphasizes protecting climate-resilient regions and learning from historical plant responses.

Changes in Monsoon Affect Marine Productivity

Recent Context :

Study shows that **strong or weak monsoons disrupt ocean mixing in Bay of Bengal**, reducing nutrient upwelling, marine plankton growth, and threatening **fish stocks and coastal livelihoods**.

ABOUT:

1. **Bay of Bengal** – Subject to **seasonal monsoon-driven upwelling**; nutrient-rich deep waters support fisheries.

2. **Extreme monsoons** – Both abnormally strong and weak monsoons reduce **vertical ocean mixing**.
3. **Impact on plankton** – ~50% reduction in surface plankton productivity during extreme monsoon events.
4. **Food chain disruption** – Decline in plankton affects **fish, shellfish, and higher trophic levels**.
5. **Livelihood impact** – Threatens **coastal communities dependent on fishing**.
6. **Methodology** – Reconstruction using **22,000-year paleoclimate data, fossils, chemical signatures** and climate models.
7. **Broader implication** – Demonstrates link between **climate variability and marine ecosystem productivity**.

Marine Pollution: MSC ELSA 3 Sinks off Kerala Coast

Recent Context :

Liberian container ship **MSC ELSA 3** sank off Kerala with **hazardous cargo**, raising risks of oil spills, chemical and plastic pollution; declared **state-specific disaster** by Kerala.

ABOUT:

1. **Oil spill impact** – Kills marine life, damages mangroves/coral reefs, bioaccumulates toxins.
2. **Cleanup methods** – **Skimming, in situ burning, and chemical dispersants** (with drawbacks).
3. **International law** – India is signatory to **MARPOL (Annex III)** and **SOLAS Conventions**.
4. **Polluter liability** – Shipowner and flag state are **primarily liable**; 'Polluter Pays' principle under **Environment Protection Act, 1986**.
5. **Merchant Shipping Act, 1958** – DG Shipping investigates marine accidents, vessel seaworthiness, and IMDG code compliance.
6. **Hazardous cargo** – Mismanagement violates **International Maritime Dangerous Goods Code**.
7. **Legal recourse** – India may claim compensation for **ecological, health, and economic damages**.

Plastic Pollution from Tyres of EVs

Recent Context :

EVs, heavier and faster than conventional vehicles, cause **greater tyre wear**, releasing **ultra-fine plastic particles (1–10 microns)** into air, which are **not covered under current PM2.5/PM10 norms**.

ABOUT:

1. **EV weight factor** – 15–20% heavier than conventional cars due to **batteries**, increasing tyre wear.
2. **Tyre wear emissions** – Produces **microplastics and ultrafine particles (1–10 µm)** suspended in air.
3. **Friction & acceleration** – Rapid acceleration causes **higher tyre heat and wear**, amplifying pollution.
4. **Current regulation gap – PM2.5/PM10 standards** do not cover ultrafine particles from tyres.
5. **Air quality impact** – Ultra-fine plastic particles can **penetrate deep into lungs**, posing health risks.
6. **Policy implication** – Need for **expanded vehicular pollution norms** covering tyre microplastics.
7. **Sustainability challenge** – EV adoption reduces tailpipe emissions but **increases tyre-derived particulate pollution**.

SOURCE – INDIAN EXPRESS

Methane Emissions – Global Initiatives & India's Stance

Recent Context:

At COP26, the Global Methane Pledge (GMP) sought a 30% cut in emissions by 2030. India declined, citing “survival emissions” in farming and livestock, while advancing domestic mitigation programs.

About:

1. **Methane's Impact** – ~30% of global warming; 12-year lifespan (shorter than CO₂ but more potent).
2. **Main Sources** – Agriculture (~40%, livestock & paddy), fossil fuels (~35%), waste (~20%).
3. **Global Mechanisms** –
 - UNFCCC (1992) → Framework.

- Kyoto Protocol (1997) → Binding methane targets.
- Paris Agreement (2015) → Voluntary, NDCs.
- COP26 → *Global Methane Pledge (GMP)*.

4. **Supporting Initiatives** – UNEP's IMEO & MARS, Global Methane Initiative (2004), CCAC, Global Methane Hub.
5. **India's Non-Signature** – Emissions from subsistence agriculture; survival vs luxury emissions; rice export dependency.
6. **India's Mitigation Efforts** – NMSA (paddy practices), DAHD's livestock mission, GOBAR-Dhan, National Biogas Programme.
7. **Global Approach Needed** – Fossil fuel methane easier to monitor (few actors); agriculture-linked methane harder (linked to livelihoods & food security).

India Boosts Reservoir Capacity in Indus River System

Recent Context :

After suspension of the **Indus Waters Treaty**, India began **reservoir maintenance at Baglihar and Salal** on the Chenab, reducing downstream water flow to Pakistan by ~90%.

ABOUT:

1. **Indus River** – Antecedent river; source near **Mansarovar Lake, Tibet**; flows northwest then southwest into Pakistan.
2. **Tributaries (Panjnad)** – Jhelum, Chenab, Ravi, Beas, Sutlej; key for hydroelectric projects and irrigation.
3. **Hydropower projects** – Baglihar, Salal, Dulhasti (Chenab); Chamera, Thein (Ravi); Pong, Pandoh (Beas); Bhakra-Nangal (Satluj).
4. **Reservoir operations** – Flushing and maintenance **increase holding capacity and power generation efficiency**.
5. **Strategic impact** – Reduces downstream water to Pakistan; relevant in **India-Pak water disputes**.
6. **Multipurpose use** – Projects provide **irrigation, flood control, and hydroelectricity**.

7. **Geopolitical relevance** – Indus Basin infrastructure vital amid **Indus Waters Treaty tensions**.

Upper Bhavani Pumped Storage Project (Tamil Nadu)

Recent Context :

MoEFCC approved EIA for the 1000 MW **Upper Bhavani Pumped Storage Project** in Nilgiris to generate **peak-hour electricity**, near Mukurthi National Park biodiversity hotspot.

ABOUT:

1. **Pumped storage principle** – Water pumped to upper reservoir during low demand; released to generate electricity during peak demand.
2. **Location** – Upper Bhavani and Avalanche-Emerald reservoirs, Nilgiris, Tamil Nadu; tributary of **Bhavani-Cauvery river system**.
3. **Power capacity** – 1000 MW, **energy storage linked to reservoir size**.
4. **Environmental concerns** – Area in **Western Ghats biodiversity hotspot**; home to **Shola forests and endangered species**.
5. **Regulatory framework** – EIA under **Environment Protection Act, 1986**; MoEFCC evaluates environmental, social, economic impact.
6. **Hydropower advantage** – Enables **renewable, flexible, peak-load electricity generation**.
7. **Sustainable planning** – EIA ensures mitigation of **ecological and social impacts** before project approval.

Siang Upper Multipurpose Project (Arunachal Pradesh)

Recent Context :

Proposed **11,000 MW multipurpose project on Siang river**, Arunachal Pradesh, aims to **maintain water flow, modulate floods**, in response to China's upstream hydropower activities; faces local protests.

ABOUT:

1. **Siang/Brahmaputra system** – Yarlung Tsangpo (China) → Siang (Arunachal Pradesh) → Brahmaputra (Assam) → Padma-Meghna (Bangladesh).

2. **Strategic need** – Counter **China's 60,000 MW Tsangpo hydropower project** and ensure downstream water security.
3. **Project capacity** – 11,000 MW multipurpose hydropower; also aids **flood management**.
4. **Environmental/social concerns** – May displace **~100,000 locals**, affects forests and ecosystems; protests from Adi tribes.
5. **Tribals affected** – **Adi tribes** rely on jhum cultivation, forest resources; practice **Animism (Donyi Polo)**.
6. **Geographical context** – Upper Siang district; river traverses Arunachal Pradesh before entering Assam.
7. **Hydropolitical significance** – India's **river infrastructure planning** linked to upstream developments in China and water-sharing strategy.

Hydrogen Fuel Cell Vehicles (HFCVs) – Technology & India's Push for Clean Mobility

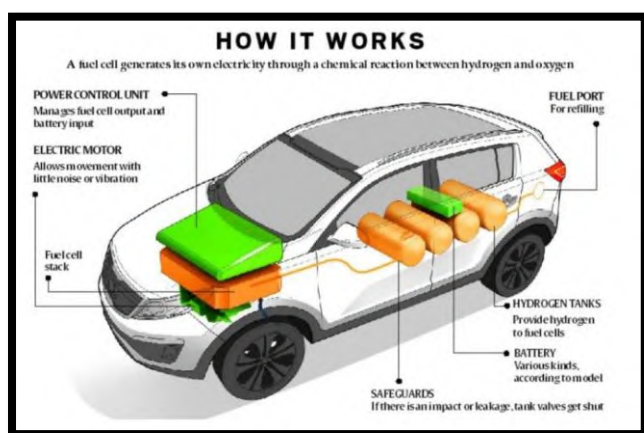
Recent Context :

India is accelerating HFCV adoption with Indian Oil–Hyundai MoU, a mining logistics HFCV in Chhattisgarh, and Indian Railways' hydrogen-powered train plan, aligning with Net Zero 2070 commitments.

About:

1. **Working Principle** – HFCs use Proton Exchange Membrane (PEM); hydrogen splits into protons & electrons → electricity generated via electrochemical reaction with oxygen → byproduct = water vapour.
2. **Advantages** – Zero tailpipe emissions, long driving range, quick refuelling, suitable for heavy-duty vehicles (trucks, buses), silent & reliable operation.
3. **Challenges** – High production cost, limited refuelling infrastructure, durability concerns, safety perception, dependence on green hydrogen for true sustainability.
4. **Types of Hydrogen** –
 - Green: Electrolysis using renewables (clean).
 - Blue: Fossil fuels + CCS.
 - Grey: Natural gas.

- Brown: Coal-based (polluting).
- 5. **National Green Hydrogen Mission (2023)** – Aim: 5 MMT annual production capacity by 2030; develop Hydrogen Highways, refuelling centres; promote exports.
- 6. **Hydrogen Valley Innovation Clusters (HVICs)** – Pilot hubs in Kerala, TN, Gujarat, Maharashtra, Rajasthan; focus on mobility, energy & industry ecosystems.
- 7. **Government Push** – Subsidies, R&D in durable/cheap fuel cells, promotion of hydrogen economy, and global hub vision by 2047 (energy independence).



SOURCE – THE HINDU

Black Headed Caterpillar Disease (Coconut Pest)**Topic:**

Black Headed Caterpillar Disease affecting coconut trees

Recent Context

Larvae of black-headed caterpillar feed on undersides of coconut fronds, reducing photosynthesis; infestation peaks in summer and spreads via wind; biopesticides and biological agents help manage it.

Key Pointers:

1. **Affected Crop:** Coconut; common across coastal and inland India.
2. **Pest:** Black-headed caterpillar (*Opisina arenosella*).
3. **Mode of Damage:** Larvae feed under fronds forming silken galleries; destroy green tissue, reducing photosynthesis.
4. **Spread:** Infestation spreads via wind; peaks during summer.
5. **Management:** Neem-based biopesticides, root zone nourishment.

6. **Biological Control:** Release of predators like *Goniozus nephantidis*.
7. **Significance:** Major threat to coconut productivity; affects livelihood of coastal farmers.

Botrytis Fungi (Noble Rot)**Topic:**

Botrytis fungi and “Noble Rot” in crops

Recent Context :

Botrytis cinerea infects weak or dead plant tissue; in grapes, it causes noble rot, increasing sugar content; fungus releases oxalic acid and has multi-nuclear genetic material.

Key Pointers:

1. **Pathogen:** *Botrytis* fungi; most well-known species *Botrytis cinerea*.
2. **Affected Crops:** Grapes, strawberries, tomatoes.
3. **Noble Rot:** Fungal infection in grapes that dries them, increasing sugar for sweet wines.
4. **Mode of Action:** Fungus releases oxalic acid to break down plant tissue.
5. **Habitat:** Lives on dead or weak plant parts.
6. **Genetic Feature:** Multi-nuclear genetic material.
7. **Significance:** Important for viticulture and understanding fungal pathogenesis.

Similipal Tiger Reserve (STR), Odisha**Recent Context :-**

STR in Odisha blends Western Ghats, Eastern Ghats, and Himalayan biodiversity; UNESCO Biosphere Reserve; home to melanistic tigers, tribes, waterfalls, and high tiger population; AI used for anti-poaching.

Key Pointers:

1. **Location:** Mayurbhanj District, Odisha; Deccan Peninsular Bio-geographic Zone.
2. **Biodiversity:** Mix of Western Ghats, Eastern Ghats, and Eastern Himalayan species.
3. **Tiger Feature:** Habitat for melanistic tigers; highest tiger population in Odisha.
4. **UNESCO Status:** Part of World Network of Biosphere Reserves, 2009.
5. **Geography:** Surrounded by plateaus and hills; peaks include Khairiburu and Meghashini.

6. **Tribal Communities:** Kolha, Santhala, Bhumija, Bhatudi, Gondas, Khadia, Mankadia, Sahara.
7. **Innovation:** First reserve with successful TrailGuard AI anti-poaching system.



Formation and development of muscle fibers

Recent Context:

Myogenesis forms muscle fibers via myoblasts; controlled by Myf5 and MyoD proteins; occurs during fetal growth and muscle repair; essential for movement, posture, and treatment of muscle diseases.

Key Pointers:

1. **Definition:** Myogenesis is formation of muscle fibers.
2. **Cells Involved:** Myoblasts multiply, fuse to form long muscle fibers.
3. **Timing:** Occurs during fetal development and post-injury repair.
4. **Key Proteins:** Myf5 (early muscle cell formation), MyoD (maturation into fibers).
5. **Functions:** Muscle growth, movement, posture, and body strength.
6. **Medical Relevance:** Helps understand muscle repair and treatment of muscle-related diseases.
7. **Significance:** Critical for developmental biology and regenerative medicine.

Integrated Biodiversity Assessment Tool (IBAT) Alliance

Recent Context :

IBAT, launched in 2008, is a global coalition providing datasets like WDPAs, KBAs, and IUCN Red List; aids

biodiversity assessment and corporate, conservation, and policy decision-making.

Key Pointers:

1. **Launch:** 2008 at IUCN World Conservation Congress.
2. **Type:** Web-based biodiversity mapping and reporting platform.
3. **Coalition Members:** BirdLife International, Conservation International (CI), IUCN, UNEP-WCMC.
4. **Datasets Provided:** World Database of Protected Areas (WDPAs), World Database of Key Biodiversity Areas (WDKBA), IUCN Red List of Threatened Species.
5. **Purpose:** Supports biodiversity assessment, planning, and reporting for governments, corporations, and NGOs.
6. **Headquarters:** Cambridge, UK.
7. **Significance:** Helps in global conservation planning, impact assessment, and informed decision-making.

Kappatagudda Wildlife Sanctuary – “Western Ghats of North Karnataka”

Recent Context :

The sanctuary, recently declared an Eco-Sensitive Zone, features dry deciduous forests, grasslands, riverine zones, the Ghataprabha River, and notable heritage temples, supporting rich biodiversity in northern Western Ghats.

Key Pointers:

1. **Location:** Karnataka; part of northern Western Ghats.
2. **Nickname:** “Western Ghats of North Karnataka.”
3. **Habitats:** Dry deciduous forests, grasslands, scrublands, riverine zones.
4. **River:** Ghataprabha River (tributary of Krishna) flows through it.
5. **Cultural Heritage:** Kappatagudda Jain Basadi, Brahma Jinalaya, Trikuteshwara Temple, Dambala Temple.
6. **ESZ Status:** Union government declared an Eco-Sensitive Zone around the sanctuary.
7. **Significance:** Protects biodiversity hotspots, river ecosystems, and cultural heritage.

International Potato Centre and potato cultivation in India

Recent Context :

CIP, a CGIAR research hub, maintains the world's largest Potato Gene Bank; South Asia Regional Centre approved in Agra; India is 2nd largest potato producer, majorly from Indo-Gangetic plains.

Key Pointers:

1. **Establishment:** Founded in 1971; headquartered in Lima, Peru.
2. **Scope:** Global research-for-development on potato, sweet potato, Andean root/tuber crops.
3. **Partnership:** Part of CGIAR – global agriculture science and food security network.
4. **Regional Presence:** Operates in 20+ countries; South Asia Regional Centre (CSARC) approved at Agra, UP.
5. **India's Status:** 2nd largest potato producer & consumer; 4th most important food crop after rice, wheat, maize.
6. **Cultivation Facts:** Cool-season crop (ideal 24°C growth, 20°C tuber formation); majorly grown in Indo-Gangetic plains (UP ~30%, West Bengal ~23.5%, Bihar ~17%).
7. **Challenges & Schemes:** Faces Late Blight disease; Operation Greens (2018) stabilizes prices/supply of Tomato, Onion, Potato (TOP).

WMO report on Asia's climate 2024

Recent Context :

WMO's "State of the Climate in Asia 2024" reports Asia's 2nd warmest year, warming twice faster than global average, with record-high sea-surface temperatures, signaling accelerating regional climate change.

Key Pointers:

1. **Report:** "State of the Climate in Asia 2024" by WMO.
2. **Finding:** Asia is warming twice as fast as the global average; 2024 was the 2nd warmest year on record.
3. **Sea Temperatures:** Highest sea-surface temperatures recorded in the region.
4. **WMO Establishment:** Founded 1950; specialized UN agency on meteorology,

climatology, hydrology, and related geophysical sciences.

5. **Predecessor:** International Meteorological Organization (IMO), established 1873.
6. **Members & HQ:** 193 members (187 states + 6 territories); Headquarters in Geneva, Switzerland.
7. **Related Bodies:** IPCC established in 1988 by WMO and UNEP to assess climate change science; WMO also publishes Greenhouse Gas Bulletin and Status of the World Climate.

Himalayan Brown Bear – Critically Endangered high-altitude mammal

Recent Context

Largest mammal in high Himalayas, *Ursus arctos isabellinus*, survives in fragmented alpine habitats in India and neighboring countries; critically endangered due to habitat loss and low population density.



Key Pointers:

1. **Names:** Himalayan Brown Bear / Himalayan Red Bear / Isabelline Bear / Denmo (Ladakhi).
2. **Scientific Name:** *Ursus arctos isabellinus*.
3. **Status:** IUCN – Critically Endangered; Wildlife Protection Act 1972 – Schedule I; CITES – Appendix I.
4. **Distribution:** Northwestern & central Himalayas – Pakistan, India, Nepal, Bhutan, Tibetan Autonomous Region; India: J&K, HP, Uttarakhand (3,000–5,500 m).
5. **Physical Traits:** Males larger than females; omnivorous; hibernate in dens during winter; lifespan 20–30 years.
6. **Behavior:** Solitary; interact only for mating or fighting over mates.
7. **Significance:** Represents one of the most ancient brown bear lineages; conservation critical for alpine ecosystem health.

Nano Fertilizers – Advanced, controlled-release nutrients for sustainable agriculture

Recent Context

IFFCO set up the first overseas nano-fertilizer plant in Brazil; India develops **nanoclay-coated MoP**; nano-fertilizers enhance nutrient absorption, reduce wastage, and promote sustainable farming globally.

Key Pointers:

1. **Definition:** Nutrients encapsulated or coated within nanomaterials (<100 nm) for slow, controlled release.
2. **Organizations:** IFFCO – introduced Nano Urea Liquid (2022); first overseas plant in Brazil.
3. **Composition:** Ammonium humate, ammonia, urea, peat, plant wastes, synthetic fertilizers; developed via mechanical & biochemical processes.
4. **Recent Innovation:** Nanoclay-coated Muriate of Potash (MoP) developed in Nov 2024; meets 80% of potassium fertilizer demand.
5. **Advantages:** Improved nutrient absorption, reduced wastage, better crop productivity, lower frequency of application, sustainable farming.
6. **Environmental Impact:** Reduces soil & water contamination compared to conventional fertilizers.
7. **Significance:** Addresses food security while minimizing ecological footprint; aligns with modern precision agriculture practices.

Giant African Snail – Invasive land snail

Recent Context

Introduced to India from East Africa in 1847, mainly found in Kerala; hermaphroditic, long-lived, highly invasive, and capable of causing Eosinophilic meningitis in humans.

Key Pointers:

1. **Scientific Info:** Largest land snail; hermaphroditic.
2. **Introduction:** Brought to India in 1847 from East Africa.
3. **Distribution:** Predominantly Kerala; high genetic diversity in India.
4. **Lifespan:** 3–5 years; hibernation/aestivation can extend survival up to 2 years.

5. **Health Impact:** Can cause Eosinophilic meningitis in humans.
6. **Ecological Impact:** Considered one of the worst invasive species by IUCN.
7. **Significance:** Threat to agriculture and native ecosystems due to feeding on crops.



Gambusia affinis – Biological mosquito control agent

Recent Context

Native to southeastern US, introduced to India since 1928 for malaria control; thrives in freshwater, outcompetes native species, listed as one of 100 worst invasive alien species by IUCN.

Key Pointers:

1. **Scientific Name:** *Gambusia affinis*.
2. **Origin:** Southeastern United States.
3. **Introduction:** India, 1928, as part of malaria control.
4. **Distribution in India:** Assam, Arunachal Pradesh, Gujarat, Karnataka, Maharashtra, Rajasthan, Tamil Nadu, UP, Odisha, Punjab, Andhra Pradesh.
5. **Habitat:** Ponds, lakes, slow-moving rivers; adapts to temperate and tropical regions.
6. **Ecological Threat:** Outcompetes native fish species, threatens biodiversity.
7. **Significance:** Example of unintended consequences of biological control.

Guppies – Small invasive fish used for mosquito control

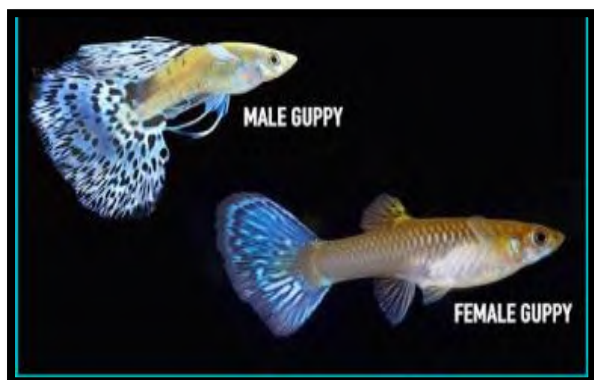
Recent Context

Native to South America and Caribbean, introduced in India for mosquito control; colorful, small, short-lived, also a model organism for ecology, evolution, and behavioral studies.

Key Pointers:

1. **Scientific Name:** *Poecilia reticulata*.
2. **Origin:** Tropical South America and Caribbean.
3. **Use:** Introduced to control mosquito larvae.

4. **Distribution:** Freshwater streams and pools across India.
5. **Physical Traits:** Males smaller, brightly colored; lifespan 2–3 years.
6. **Research Significance:** Model organism in ecology, evolution, and behavioral studies.
7. **Ecological Impact:** Invasive, may compete with native species.



Russell's Viper – Highly venomous terrestrial snake

Recent Context

One of India's "Big Four" snakes; responsible for over half of snakebites; venom research shows drugs varespladib and marimastat can counter PLA2 and SVMP toxins effectively.



Key Pointers:

1. **Scientific Name:** *Daboia russelii*.
2. **Other Big Four Snakes:** Common krait, Indian cobra, Saw-scaled viper.
3. **Distribution:** India, Sri Lanka, Bangladesh, Nepal, Myanmar, Thailand, Pakistan, Cambodia, Tibet, China, Taiwan, Indonesia.
4. **Habitat:** Open, grassy, bushy areas; nocturnal.
5. **Venom Components:** Phospholipase A2 (PLA2), Snake Venom Metalloproteinase (SVMP).
6. **Medical Significance:** Polyvalent antivenoms (PVAs) used; research shows varespladib and marimastat inhibit venom toxins.

7. **IUCN Status:** Least Concern; high medical importance due to snakebite fatalities.

Rinderpest – Viral disease of cloven-hoofed animals

Recent Context

ICAR-NIHSAD, Bhopal, recognized as a Category A Rinderpest Holding Facility by WOA and FAO; no public health risk as it does not infect humans.

Key Pointers:

1. **Other Names:** Cattle plague.
2. **Causative Agent:** Virus, **Paramyxoviridae** family, genus **Morbillivirus**.
3. **Affected Species:** Cattle, buffalo, zebu, African buffalo, eland, kudu, wildebeest, antelopes, bushpigs, warhogs, giraffes.
4. **Human Health:** No public health risk.
5. **Global Status:** Declared eradicated globally in 2011; vaccine no longer widely needed.
6. **Indian Facility:** ICAR-NIHSAD, Bhopal – Category A Holding Facility.
7. **Designation Authority:** WOA (World Organisation for Animal Health) and FAO (Food and Agriculture Organization).

Biotechnology Policy – High-performance biomanufacturing & bioeconomy

Recent Context

Union Cabinet approved **BioE3 Policy** to foster **high-performance biomanufacturing** and scale India's bioeconomy to **US\$ 300 billion by 2030**.

Key Pointers:

1. **Objective:** Scale up bio-based products production across sectors, promote innovation, entrepreneurship, and bio-industrial growth.
2. **Implementing Agency:** **Department of Biotechnology (DBT)**, Government of India.
3. **Key Focus Areas:**
 - R&D and entrepreneurship
 - Biomanufacturing & Bio-AI hubs
 - Biofoundries
4. **Definition (FAO):** Bioeconomy = production, use, and conservation of biological resources, including related knowledge, technology, and innovation across all economic sectors.

5. **Applications:**

- Sustainable agriculture, forestry, aquaculture, fishing
- Food and feed manufacturing
- Bio-based products (bioplastics, biodegradable clothing)

6. **Economic Target:** US \$300 billion bioeconomy by 2030.

7. **Strategic Importance:** Promotes sustainable growth, employment, and global competitiveness in biotech manufacturing.

SOURCE – VISION MONTHLY**Agroforestry in India****Recent Context:**

- Government issued **Model Rules 2025** for **felling of trees on agricultural land** to promote agroforestry.

Relevant Pointers

1. **Definition:** National Agroforestry Policy 2014 defines agroforestry as a **land use system integrating trees/shrubs on farmland** to enhance productivity, profitability, diversity, and ecosystem sustainability.
2. **Coverage:** Agroforestry plantations occupy **~8% of India's geographical area**.
3. **Environmental Significance:** Sequesters **13.7–27.2 tonnes CO₂ per hectare per year**, improves soil organic carbon (SOC), reduces soil salinity, erosion, and nutrient leaching.
4. **Economic Significance:** Provides **~50% fuelwood, 60% raw material for paper/pulp**, and **9–11% green fodder** for livestock; supports agricultural growth (~4% target).
5. **Food Security & Yield:** Increases crop yield by **~51%**, reduces crop failure risk, and improves community nutrition and stability.
6. **Challenges:** Cumbersome permits, restrictive regulations, shortage of superior planting material, overemphasis on water-intensive species like **Eucalyptus**, and underutilization of **National Transit Pass System (NTPS)**.
7. **Model Rules 2025 Key Points:** Registration of land for agroforestry, felling of trees under agroforestry, and certification/transit of timber produced.

International Conference on Disaster Resilient Infrastructure (ICDRI) & Coastal Resilience**Recent Context:**

- **ICDRI 2025** held in France; first edition in Europe.
- **African Union joined India's Coalition for Disaster Resilient Infrastructure (CDRI).**
- Conference theme: **"Shaping a Resilient Future for Coastal Regions"**.
- Launch of **call to action for coastal resilience in Small Island Developing States (SIDS).**

Relevant Pointers

1. **CDRI:** Launched by India at UN Climate Action Summit 2019; 56 members; Secretariat in New Delhi; India as permanent co-chair; partners include UN agencies, MDBs, private sector.
2. **Key Initiatives:** IRIS (for SIDS); Infrastructure Resilience Accelerator Fund (with UNDP & UNDRR).
3. **Coastal Vulnerability:** 60% global population & 2/3 large cities in coastal zones; ~250M Indians within 50 km of coast; threats—cyclones, tsunamis, erosion, sea-level rise.
4. **Major Hazards:** 2004 Tsunami (>2.3 lakh deaths); Cyclone Fani 2019 (US\$1.2B damage in Odisha); 2023 Kutch–Morbi storm surge (2–2.5 m); 33.6% of India's coastline eroding.
5. **Indian Initiatives:** CRZ Notification 2019; ICZMP (Odisha, WB); CVI by INCOIS; Multi-Hazard Vulnerability Maps; CMIS for planning & coastal protection.
6. **Significance:** Protects lives, infrastructure, biodiversity; mangroves and fisheries at risk from climate impacts.
7. **Climate Link:** Climate change worsens floods, storms, sea-level rise; linked with NAPCC missions like National Water Mission for resilience.

Crowd Disaster Management / Stampedes**Recent Context:**

- **Stampede at Chinnaswamy Stadium, Bangalore (2025)** after Royal Challengers Bangalore's IPL victory.
- Several fatalities and injuries reported due to **overcrowding and poor coordination**.

Relevant Pointers

1. **Definition:** UNDRR – surge in crowd due to perceived danger or space loss; also called crushing.
2. **Causes:** Overcrowding (Chinnaswamy 2025), panic/structural failure (Elphinstone 2017), fire hazards (Dabwali 1995), celebrity/event rush (Pushpa 2, 2024).
3. **Crowd Control Failures:** Poor coordination, inadequate exits, weak infrastructure, unplanned free entry schemes.
4. **NDMA Preparedness:** FMEA risk analysis, crowd density norms, multiple exits, multilingual signage, PA systems, medical facilities, disaster vehicles.
5. **NDMA Response:** Mobile alerts, loudspeakers, digital boards, CCTV, watchtowers, wireless comms.
6. **Global Example:** New York – trained crowd control managers for gatherings of 1,000+.
7. **Significance:** Prevents casualties in mass events; needs integrated planning, stakeholder coordination, and real-time monitoring.

Bharat Forecast System (BFS) – High-Resolution Weather Forecasting

Recent Context:

- **Ministry of Earth Sciences** unveiled BFS, one of the world's first **indigenously developed high-resolution weather forecast systems**.

Relevant Pointers

1. **Developer:** IITM Pune, Ministry of Earth Sciences.
2. **Resolution:** Improves forecast scale from 12 km → 6 km; enables village-level predictions.
3. **Data Inputs:** 40 Doppler Weather Radars; Doppler effect improves velocity & local accuracy.
4. **Performance:** 64% more accurate in high-risk zones; forecast time cut from 12–14 hrs → 4–6 hrs.
5. **Global Standing:** Higher resolution than US, UK, EU systems (6 km vs 9–14 km).
6. **Applications:** Disaster management, agriculture, coastal alerts, crop & irrigation planning.
7. **Tech & Economic Gains:** Uses HPC “Arka” (IITM) & “Arunika” (NCMRWF); reduces climate-related losses.

ILO Convention on Biological Hazards at Work (Convention 192)

Recent Context:

- **ILO member states** have adopted the **first-ever international convention** on biological hazards in workplaces.

Relevant Pointers

1. **Scope:** ILO Convention 192 – prevention, protection & preparedness for biological hazards at work.
2. **Member Duties:** National OSH policies; accident & emergency preparedness measures.
3. **Biohazards:** Viruses, bacteria, fungi, toxins, bioactive substances.
4. **High-Risk Jobs:** Healthcare, agriculture, labs, workplaces handling bio-agents.
5. **Drivers:** Climate change, heat stress, antimicrobial overuse.
6. **India's Concerns:** Burden on MSMEs/informal sector; risk of over-regulation.
7. **Existing Framework:** ILO Conventions 155 & 187; OSHWC Code, 2020.

State and Trends of Carbon Pricing 2025 (World Bank Report)

Recent Context:

- **World Bank** released the **State and Trends of Carbon Pricing 2025** report.
- Shows **rapid growth of carbon pricing instruments**, from 5 in 2005 to **80 currently**, with **India, Brazil, and Türkiye** actively developing them.

Relevant Pointers

1. **Coverage:** ~28% of global GHG emissions; 43 carbon taxes + 37 ETSs.
2. **Revenue:** >USD 100 billion generated in 2024.
3. **Sectors Covered:** Power highest; industry next; agriculture & waste minimal.
4. **Credit Balance:** Supply exceeds demand; ~1 billion tons unretired credits (2024).
5. **Global Provisions:** Paris Agreement Art. 6; COP29 rules for 6.2 & 6.4; CBAMs (e.g., EU).
6. **India's Scheme (2023):** Compliance + offset mechanisms under Carbon Credit Trading Scheme.

7. **Trend:** Rapid expansion of carbon pricing as climate mitigation tool.

National Mission for a Green India (GIM)

Recent Context:

- MoEFCC unveiled the revised mission document on World Day to Combat Desertification and Drought (June 17, 2025).



Relevant Pointers

- Genesis & Timeline:**
 - Launched in **2011** under **NAPCC** as one of the **eight climate missions**.
 - Revised mission period: 2021–2030.**
- Objectives:**
 - Increase forest/tree cover** on forest and non-forest lands (**afforestation over 24 million hectares**).
 - Improve ecosystem services** including carbon sequestration.
 - Create additional carbon sink:** 2.5–3.0 billion tonnes CO₂ equivalent by 2030.
- Sub-Missions:**
 - Improve forest quality and ecosystem services.**
 - Increase forest/tree cover and restore ecosystems.**
 - Enhance and diversify incomes** of forest-dependent communities.
- Funding:**
 - Partly from **GIM's own allocation**, rest from **National CAMPA Fund**.
- Implementation Model:**
 - Bottom-up approach;** Joint Forest Management Committees (JFMCs) are key implementers.
- Significance:**

- Contributes to **climate mitigation, biodiversity conservation, and livelihood security** for forest communities.

7. Afforestation & Ecosystem Focus:

- Targets **both forest and non-forest lands**, integrating **ecological restoration** with **community benefits**.

Global Drought Outlook, 2025

Released by: OECD

Key Findings:

- Severity:**
 - 40% of global land faces **increasingly frequent and severe droughts**.
 - Recent examples: **Europe (2022), California (2021), Horn of Africa, Somalia**.
- Economic Impact:**
 - Annual cost of drought: **3–7.5% increase per episode**.
 - Disruptions in **hydroelectric power, inland water transport**, crop yields (up to **22% decline**).
 - Example: **Panama Canal drought affected inland transport**.
- Ecological Impact:**
 - Soil moisture decline:** 37% of land since 1980.
 - Groundwater depletion:** 62% of monitored aquifers declining.
- Human Impact:**
 - Droughts cause **34% of disaster-related deaths** globally (WMO, 2021).
 - Exacerbate **poverty, inequality, and displacement**.
- Regional Concerns:**
 - India, Australia**—risk of hydroelectric and irrigation disruptions.

Global Ocean Darkening Threatens Underwater Ecosystems

Study: UK researchers (2003–2022)

Affected areas: Arctic, Antarctic, Gulf Stream region

What is Ocean Darkening?

- **Reduction in light penetration**, shrinking the **photic zone** (~200 m) where ~90% of marine life thrives.
- Causes **limits on photosynthesis, growth, reproduction, and marine communication**.

Causes:

1. Coastal Oceans:

- Nutrient, sediment, and organic material loading (e.g., agricultural runoff, heavy rainfall).

2. Open Oceans:

- Warming surface oceans → algal blooms.
- Climate-driven changes in **ocean circulation**.

Impacts:

- **Marine ecology:** Reduced productivity and habitat compression.
- **Fisheries:** Decline in fish stocks due to disrupted reproductive cycles.
- **Climate regulation:** Hampers **carbon absorption** and **oxygen production**.

Third United Nations Ocean Conference (UNOC3)

Location & Hosts:

- Held in **Nice, France**; co-hosted by **France and Costa Rica**

Key Outcome: Nice Ocean Action Plan

Highlights:

1. **SDG 14 Roadmap:** Focused on conserving and sustainably using oceans, seas, and marine resources.
 - Recognized **SDG 14 as least funded** of all SDGs.
2. **Plastic Pollution:** Reaffirmed commitment to **develop an international legally binding instrument**.
3. **Climate & Acidification:** Called for **coordinated global action** to reduce impacts on oceans and coastal communities.
4. **Global Collaboration:** Encourages **joint research, policy alignment, and finance mechanisms** for ocean protection.

New Ramsar Sites in Rajasthan, India (2025)

Total Ramsar Sites in India: 91

Rajasthan now has: 4 sites (including **Sambhar Salt Lake, Keoladeo Ghana NP**)

New Sites:

1. Khichan Wetland

- **Location:** Northern Thar Desert, Phalodi District, Rajasthan
- **Features:** Two water bodies—Ratri Nadi & Vijaysagar Talab, riparian habitat, scrub land
- **Wildlife:** Large wintering flocks of **migratory demoiselle cranes** (*Anthropoides virgo*)

2. Menar Wetland Complex

- **Location:** Menar & Kheroda villages, Udaipur District, Rajasthan
- **Features:** Freshwater monsoon wetland formed by **Braham Talab, Dhand Talab, Kheroda Talab**
- **Wildlife:** Critically endangered **white-rumped vulture** (*Gyps bengalensis*), **long-billed vulture** (*Gyps indicus*)
- **Flora & Fauna:** 70+ plant species, mango trees supporting **Indian flying fox** (*Pteropus giganteus*)

Event Link: Declared on **World Environment Day, 5th June 2025**

- **Theme:** Beat Plastic Pollution

Greater Flamingo Sanctuary, Tamil Nadu

Recent Context -:

Tamil Nadu notified **Greater Flamingo Sanctuary at Dhanushkodi** to protect a critical stopover along the **Central Asian Flyway** for thousands of migratory wetland birds.

About Greater Flamingo (Prelims Pointers):

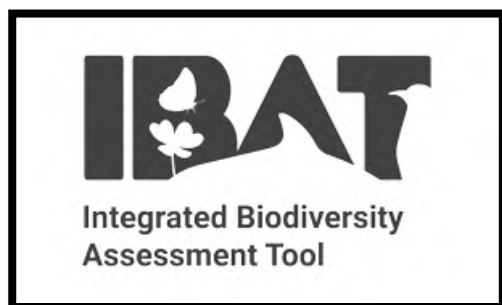
1. **Scientific Name:** *Phoenicopterus roseus*
2. **IUCN Status:** Least Concern
3. **Distribution:** Africa, western Asia (India), southern Europe
4. **Habitat:** Shallow saline or alkaline wetlands for breeding
5. **Behaviour:** Highly philopatric; disperses widely outside breeding season

6. **Unique Breeding Site in India:** Kachchh Desert Wildlife Sanctuary, Great Rann of Kachchh – called “**Flamingo City**”
7. **Significance:** Protects migratory stopover along **Central Asian Flyway**

IBAT Alliance

Recent Context :-

IBAT Alliance **doubled its investment in biodiversity data** from 2023–2024, supporting global datasets to enhance monitoring of protected areas, threatened species, and key biodiversity sites.



About IBAT Alliance (Prelims Pointers):

1. **Headquarters:** United Kingdom
2. **Founded:** 2008
3. **Members:** BirdLife International, Conservation International, IUCN, UNEP-WCMC
4. **Mission:** Provide data, tools, and guidance on biodiversity risks
5. **Key Datasets Supported:** World Database on Protected Areas, IUCN Red List, World Database of Key Biodiversity Areas
6. **Focus:** Strengthening global biodiversity monitoring and conservation decision-making
7. **Significance:** Helps organisations mitigate biodiversity-related risks and align with conservation priorities

Energy Transition Index (ETI) 2025

Recent Context :-

WEF released **ETI 2025**, ranking countries on progress from fossil fuels to clean energy. India slipped from **63rd (2024) to 71st**, indicating slower energy transition progress.

About ETI (Prelims Pointers):

1. **Purpose:** Measures countries' energy transition from fossil fuels to clean energy

2. **Top Rankers (2025):** Sweden, Finland, Denmark, Norway
3. **India's Rank:** 71 (down from 63 in 2024)
4. **Two Main Dimensions:** System Performance & Transition Readiness
5. **System Performance:** Energy security, equity, sustainability
6. **Transition Readiness:** Regulation, infrastructure, investment, and capabilities
7. **Methodology:** 43 indicators; scores countries 0–100 using multi-source data

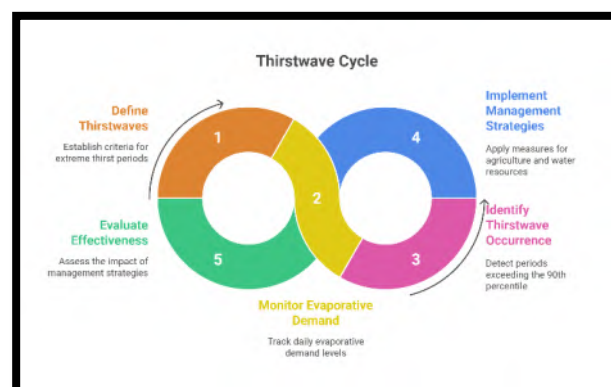
Thirstwave

Recent Context :-

Researchers defined ‘**Thirstwaves**’, periods of extreme atmospheric thirst (≥ 3 consecutive days with evaporative demand above 90th percentile), important for **agriculture and water resource management**.

About Thirstwave (Prelims Pointers):

1. **Definition:** ≥ 3 consecutive days with daily evaporative demand above historical 90th percentile
2. **Evaporative Demand:** Measures how “thirsty” the atmosphere is
3. **Drivers:** Temperature, wind speed, humidity, sunshine
4. **Impact:** Helps in managing irrigation and crop yields
5. **Research Significance:** Identifies periods of extreme drought stress for farming
6. **Novelty:** Newly coined term in climate and agricultural research
7. **Geographical Relevance:** Can affect water-stressed regions globally



Salkhan Fossil Park, Uttar Pradesh

Recent Context :-

Salkhan Fossil Park (Sonbhadra) added to **UNESCO tentative World Heritage list**, representing **Precambrian stromatolites** and providing insight into Earth's early oxygenation and life evolution.

About Salkhan Fossil Park (Prelims Pointers):

1. **Location:** Kaimur Range, Sonbhadra District, Uttar Pradesh
2. **Significance:** Geo-heritage site under IUCN 2020 "Evolution of Life" guidelines
3. **Age:** Fossils approx. 1.4 billion years old
4. **Key Fossils:** Stromatolites (blue-green algae)
5. **Historical Event:** Records **Great Oxidation Event** – first atmospheric oxygen accumulation
6. **Scientific Importance:** Shows Precambrian era (~85% of Earth's history) and early environmental changes
7. **Adjacent Landmark:** Kaimur Wildlife Sanctuary

SOURCE – DRISHTI MONTHLY

3rd UN Ocean Conference (UNOC3), 2025

Recent Context :-

UNOC3 held in Nice, France, adopted "**Our Ocean, Our Future: United for Urgent Action**", reinforcing **SDG 14** and tackling climate change, biodiversity loss, and pollution threatening oceans.

About UNOC3 (Prelims Pointers):

1. **Purpose:** High-level UN summit to accelerate SDG 14 (Life Below Water) targets – sustainable use and conservation of oceans, seas, and marine resources.
2. **Key Declaration:** "Our Ocean, Our Future: United for Urgent Action" focusing on triple planetary crisis.
3. **Triple Planetary Crisis:** Climate change, biodiversity loss, and pollution & waste – interlinked threats affecting oceans.
4. **Major Objectives:** Strengthen global ocean governance, address ocean acidification, climate impacts, overfishing, marine pollution, and biodiversity loss.
5. **Key Outcomes:**

- Promote full implementation of CBD, Kunming-Montreal Biodiversity Framework, BBNJ Agreement
- Support sustainable ocean economies for SIDS and LDCs
- Integrate scientific research, indigenous knowledge, and ocean mapping in policy-making

6. Major Initiatives Announced:

- EU: €1B investment for ocean conservation and sustainable fishing
- French Polynesia: Largest marine protected area (5 million sq km)
- Spain: Five new marine protected areas
- Indonesia & World Bank: Coral Bond for reef restoration
- 37-country High Ambition Coalition for a Quiet Ocean

Biopesticide for Cardamom Thrips

Recent Context :-

ICAR-IISR Kozhikode developed an **eco-friendly biopesticide using *Lecanicillium psalliotae*** to control cardamom thrips, reducing chemical use and promoting sustainable, export-compliant cardamom cultivation.

About the Biopesticide :

1. **Pest Targeted:** Cardamom thrips (*Sciothrips cardamomi*), a major pest affecting cardamom plantations.
2. **Active Agent:** *Lecanicillium psalliotae*, an entomopathogenic fungus that infects larvae, pupae, and adult pests.
3. **Mode of Action:** Penetrates pest outer layer, feeds internally, acting on contact; similar to *Beauveria bassiana* and *Metarhizium anisopliae*.
4. **Formulation & Application:** Granular form mixed with farmyard manure; applied 3–4 times to plant basins.
5. **Benefits:** Cost-effective, reduces dependence on chemical pesticides, enhances root growth, improves soil nutrient availability.

6. **Significance:** Eco-friendly, non-toxic, minimizes environmental and health risks.
7. **Strategic Role:** Supports Integrated Pest Management (IPM), sustainable agriculture, and meets international residue standards for exports.

Reforming India's Food and Fertiliser Subsidies

Context:

With **extreme poverty at historic lows (5.3%)** and rising subsidy bills, India faces a growing need to reform **food and fertiliser subsidies** for efficiency and fiscal sustainability.

ABOUT

1. **Definition & Types:** Govt. support via direct (cash – PM-KISAN) & indirect (price control/tax exemption – PDS, LPG) means.
2. **Scale & Impact:** FY26 food subsidy ₹2.03 lakh cr; fertiliser ₹1.56 lakh cr; PDS covers 800M; poverty fell 27.1%→5.3% (2011–2022).
3. **Issues:** Poor targeting, ghost beneficiaries, cereal-heavy nutrition gap, fertiliser imbalance (urea overuse), fiscal strain.
4. **Food Subsidy Measures:** PMGKAY merged with NFSA, digitised ration cards, TPDS focus on BPL/AAY, expanded PDS items.
5. **Fertiliser Measures:** Neem-coated urea, Nutrient-Based Subsidy, DBT pilots, price regulation for urea/DAP/MOP.
6. **Reform Needs:** Food/fertiliser coupons, better targeting via Aadhaar/income data, promote bio-fertilisers & natural farming.
7. **Significance:** Supports welfare, food security, and agri productivity but demands efficiency to sustain fiscal health.

Revised Guidelines Under the Biomass Programme (Phase-I, 2021–26)

Context:

The **Ministry of New and Renewable Energy (MNRE)** revised the Biomass Programme guidelines to **boost clean energy adoption, support MSMEs, and address stubble burning** with greater flexibility and financial incentives.

ABOUT

1. **Launch & Objective:** MNRE under National Bioenergy Programme Phase-I (2021–26); promotes biomass briquette/pellet plants & industrial biomass cogeneration (non-bagasse).
2. **Financial Aid:** CFA – ₹9 lakh/MTPH for briquette/pellet plants (max ₹45 lakh), ₹40 lakh/MW for cogeneration (max ₹5 cr).
3. **Monitoring:** IoT/SCADA-based remote monitoring; projects via online portal.
4. **Eligibility & Oversight:** Only new equipment; inspections by SNAs & SSS-NIBE.
5. **Recent Revisions:** Less paperwork, flexible sale contracts, IoT in place of costly SCADA, pro-rata CFA based on plant operation.
6. **Special Provision:** Pellet units in Delhi–Punjab–Haryana–NCR can opt MNRE or CPCB stubble management scheme.
7. **Rationale for Change:** Cut MSME regulatory burden, reduce monitoring costs, improve stubble utilisation, and make CFA norms flexible.

SOURCE- DOWN TO EARTH

Food Crops & Ethanol-Blending Programme in India

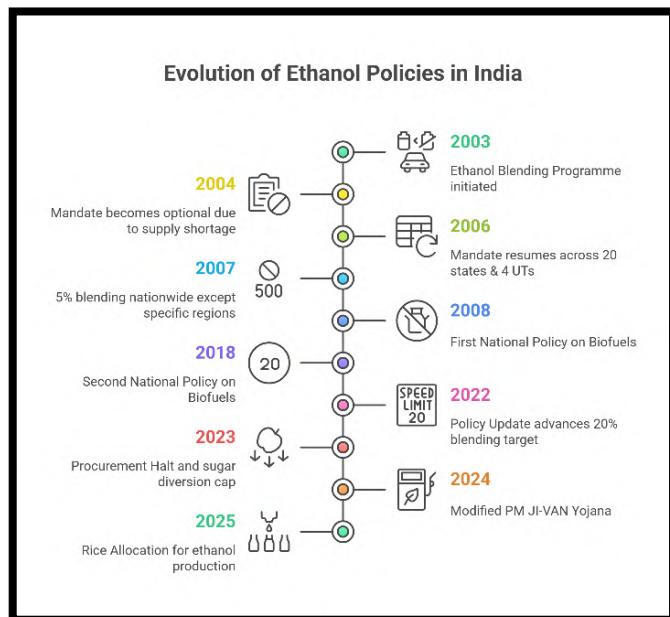
Context

- India relies heavily on **food crops (sugarcane, rice, maize)** for its ethanol-blending programme.
- This can impact **food inflation, nutrition availability**, and food security, given that over 55% of Indians struggle to afford a healthy diet (UN, 2024).
- The programme also aims to **reduce fossil fuel imports, cut carbon emissions, and boost rural incomes**, targeting **20% ethanol blending by 2025**.

Ethanol and Its Agricultural Roots

- **Primary feedstocks:**
 - **Sugarcane-based:** C-heavy & B-heavy molasses, sugarcane juice, surplus sugar
 - **Diversified feedstocks:** Surplus rice (via FCI), maize
- **Economic & environmental trade-offs:**
 - Sugar is lucrative for ethanol but **high water footprint**

- Maize is less water-intensive but has **lower ethanol yield**



- **Food security concern:** Ethanol use from food crops can reduce **nutrition availability** for the population.

Avian Influenza (Bird Flu, H5N1)

Context

- Recently, **Brazil confirmed an outbreak of avian influenza**, leading countries including **India, China, South Africa, and the EU** to **ban poultry imports** from Brazil by May-end.
- Bird flu is a **global concern due to its high contagion among birds and potential human health risks**.

ABOUT

1. **Nature & Type:** Highly contagious Influenza A virus (subtype H5N1), primarily in birds; can infect humans & mammals.
2. **Transmission:**
3. **Bird-to-bird:** Direct contact, droppings, contaminated surfaces; spread via migratory birds.
4. **Bird-to-human:** Rare; close contact with infected birds or environment.
5. **Human-to-human:** Currently limited, but mutation risk exists.

6. **Human Symptoms:** Fever, cough, sore throat → pneumonia, respiratory failure, multi-organ damage; >50% fatality rate.
7. **Treatment & Prevention:** Early detection; antivirals like Oseltamivir; poultry vaccines available, human vaccines in development.
8. **Significance:** Pandemic potential, economic losses from poultry bans, global monitoring by WHO–FAO–OIE.

Dam Project on the Siang River (Siang Upper Multipurpose Project - SUMP)

Context

- Arunachal Pradesh government signed an **MoU with a village in Upper Siang district** for a **prefeasibility survey**.
- Planned as **India's largest dam project (11.2 GW)**.

About the Project

- **River:** Siang (known as Yarlung Tsangpo in Tibet), a major tributary of the Brahmaputra.
- **Origin:** Near Mount Kailash, Tibet.
- **Proposed by:** NITI Aayog (2017), under pre-feasibility by NHPC.
- **Multipurpose:** Hydropower, flood control, irrigation, water supply.
- **Regional Context:** China is building a **66-GW hydropower project upstream**.

Concerns

1. **Social:** Displacement of local communities (e.g., Adi tribe).
2. **Environmental:** Ecosystem disruption, fisheries loss, downstream water stress.
3. **Seismic Risks:** Earthquake-prone region; dam safety concerns.



Sponge Parks in India

Concept

- **Urban green spaces** designed to **absorb, filter, and store rainwater**.
- Use **permeable surfaces, rain gardens, bioswales, native vegetation**.
- Inspired by China's '**sponge city**' concept.

Policy Push

- **MoHUA** promotes sponge parks under **AMRUT** and **Smart Cities Mission**.
- Pilot cities: Pune, Bengaluru, Bhubaneswar.
- **NIUA Guidelines (2023)**: Nature-based solutions for urban climate adaptation.

Benefits

- Reduce urban flooding and waterlogging.
- Recharge groundwater.
- Improve stormwater management and urban resilience.

Challenges

- Limited technical expertise in hydrological landscaping.
- Fragmented urban governance.
- Low public awareness about multifunctional benefits.



TOPICS COVERED-

- **Debt's Climate Link** – High public debt affects countries' ability to invest in climate mitigation and adaptation.
- **Rising Sovereign Debt in Developing World** – Developing nations face debt stress, limiting fiscal space for growth and climate action.
- **National Character of Indian Science** – Emphasizes India-specific innovation, local context, and knowledge systems in research.
- **Strengthening Wildlife Protection Laws in India** – Enhancing legal frameworks to conserve endangered species and habitats.
- **Supreme Court Recognises Oran Lands as Forests** – Judicial recognition safeguards community-managed forest lands in Rajasthan.
- **Rethinking India's Poverty Metrics** – Advocates for multidimensional measures beyond income to capture real deprivation.
- **Central Pollution Control Board (CPCB)** – India's apex pollution regulator enforcing environmental laws.
- **Construction and Demolition (C&D) Waste Rules, 2025** – Guidelines to manage urban waste sustainably.
- **Global Hunger Hotspots** – Areas facing acute food insecurity due to conflict, climate, or economic crisis.
- **Guidelines on Disposal of Expired and Unused Medicines (CDSCO)** – Prevents environmental contamination and promotes safe disposal.
- **Capping MGNREGS Spending** – Measures to optimize rural employment scheme budget while ensuring livelihoods.
- **Banks Pledged \$869BN to Fossil Fuel Firms in 2024** – Financial institutions continue high exposure to carbon-intensive sectors.
- **Green India Mission (2021–30)** – Afforestation, carbon sequestration, and ecosystem restoration initiative.
- **Ground-Level Ozone** – Harmful pollutant affecting human health, crops, and ecosystems.
- **A980 – Extreme Helium (EHe) Star** – Rare astrophysical object providing insights into stellar evolution.
- **Draft Guidelines – Discarded Solar PV Modules (CPCB)** – Regulates recycling and disposal of used solar panels.
- **United Nations Ocean Conference (UNOC3, 2025)** – Global event addressing ocean conservation, blue economy, and marine biodiversity.
- **Global Fund for Coral Reefs (GFCR)** – International financing for coral restoration and reef protection.
- **UN – Growing Threat to Oceans** – Highlights pollution, acidification, and biodiversity loss in marine ecosystems.
- **Ecological Restoration in India** – Projects restoring degraded landscapes, wetlands, and forests.
- **India's Renewable Rise – Non-Fossil Sources Cross 50% Installed Capacity** – Milestone in clean energy transition.
- **New Lichen Species – Allographa effusosoredica in Western Ghats** – Biodiversity discovery contributing to ecological studies.
- **CSS – Integrated Development of Wildlife Habitats (IDWH) Scheme** – Central scheme for wildlife corridor development and habitat protection.

- **Convention on International Trade in Endangered Species (CITES)** – Regulates trade of threatened wildlife to prevent extinction.
- **Pacific Ring of Fire (Circum-Pacific Belt)** – Seismically active region with volcanoes and earthquakes, important for hazard monitoring.
- **Draft Rules for Carbon Credit Trading Scheme (CCTS)** – Framework to trade carbon credits and promote emission reduction.
- **Environment Protection (Management of Contaminated Sites) Rules, 2025** – Guidelines for remediation of polluted lands.
- **Global Wetland Outlook 2025** – Reports status, trends, and threats to wetlands worldwide.
- **Uttarakhand – Tourist Carrying Capacity (Nainital District)** – Limits tourist influx to prevent ecological degradation.
- **ICJ Advisory Opinion on Climate Change (2025)** – Legal interpretation making climate action a global obligation.
- **ADEETIE Scheme (2025)** – Central scheme promoting ecosystem-based disaster risk reduction.
- **Human-Made Dams & Earth's Poles** – Impact of dams on polar ice, sea levels, and global hydrology.
- **Winter Fog Experiment (WiFEX)** – Studies fog formation and its effects on aviation and agriculture.
- **Kariyachalli Island** – Conservation and biodiversity hotspot in India.
- **Chenab River** – Key Himalayan river with hydropower and irrigation significance.
- **Tokara Islands (Japan)** – Monitored for biodiversity and volcanic activity.
- **Bitra Island (Lakshadweep)** – Focus on coral reefs, marine ecology, and climate resilience.
- **All India Tiger Estimation (AITE) – Small Cats Report** – Nationwide tiger census including smaller wild cats.
- **Tracking India's Climate Goals** – Monitoring renewable energy targets, emission reductions, and NDC commitments.
- **Model Rules for Felling Trees in Agricultural Lands** – Ensures sustainable tree-cutting practices without harming ecology.
- **Bonn Climate Talks 2025** – International negotiations on climate mitigation, adaptation, and finance.
- **UNEP Frontiers Report 2025 – "The Weight of Time"** – Highlights ecosystem degradation, biodiversity loss, and climate risks.
- **Centre's Exemption Policy for Thermal Plants** – Guidelines on emission exemptions for coal-fired plants.
- **Glacial Lake Outburst Floods (GLOFs)** – Sudden floods from glacial lakes, threatening lives and infrastructure.
- **River Pollution in India** – Highlights industrial, municipal, and agricultural pollutants affecting water quality.
- **World Bioproduct Day 2025 & BioE3 Policy** – Promotes sustainable bioproducts and circular bioeconomy.
- **UNFCCC Reform Call Ahead of COP30** – Push for improved climate governance and equitable financing.
- **Great Nicobar Project** – Mega-development project balancing infrastructure growth and ecological concerns.
- **Bonn Climate Change Conference 2025** – Global platform for negotiating climate commitments and technology transfer.
- **India's Air Pollution Crisis** – Rising particulate matter and urban pollution impacting health.
- **ICJ Climate Ruling Reshapes India's Policy Debate** – Legal judgment strengthens India's climate action obligations.
- **M.S. Swaminathan's Vision Transformed Mangrove Conservation Globally** – Pioneering approaches for coastal ecosystem restoration.
- **International Court Declares Climate Action a Legal Global Obligation** – Establishes binding global responsibilities for emissions reduction.
- **Climate Change Displacing and Redefining Coastal Indian Lives** – Rising sea levels and extreme events threaten livelihoods and settlements.

ENVIRONMENT AND DISASTER MANAGEMENT

SOURCE – DOWN TO EARTH

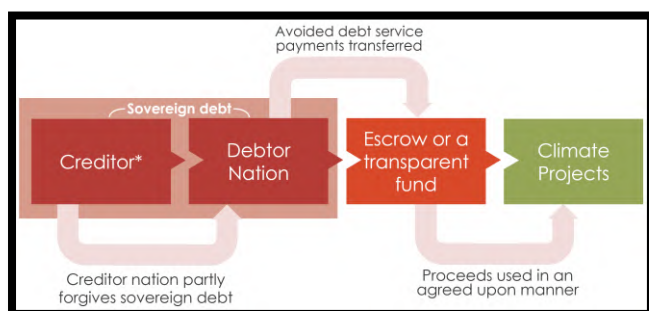
Topic: Debt's Climate Link

Recent Context -

Developing nations face a dual crisis: rising sovereign debt and worsening climate impacts. Debt repayments outpace fresh loans, undermining climate resilience and exposing financial systems favoring developed economies and extractive industries.

About -

1. **Negative Net Flow:** In 2022–23, LMICs paid **\$38.5 bn more** to creditors than they received.
2. **Debt-for-Resource Model:** Chad's **\$1.45 bn debt** to Glencore tied to oil exports.
3. **Zambia Case:** Defaulted in 2020; copper revenues directed to repay **\$1.5 bn debt** to Glencore.
4. **Climate Finance Composition:** Over **70% debt-based**, mostly mitigation-focused, not adaptation.
5. **UNCTAD Warning:** Sovereign debt in developing countries growing rapidly, leading to structural dependency.
6. **FfD4 (Seville):** Highlighted debt-climate nexus; critics call existing climate finance "financial colonialism."
7. **Reform Proposals:** Debt-for-nature swaps, multilateral debt restructuring, **grant-based finance** for low-income nations.



Topic: Rising Sovereign Debt in Developing World

Recent Context -

Developing countries spent a record **\$1.4 trillion** on foreign debt servicing in 2023. Rising interest rates, biased credit ratings, and climate shocks worsen fiscal stress, limiting growth and climate resilience.

About -

1. **1970s Oil Shock:** Petrodollars recycled via Western banks → heavy lending; by 1982, **\$63 bn annually** disbursed by private banks.
2. **Brazil Example:** 1972–88 paid **\$176 bn interest** on **\$124 bn debt**.
3. **2023 Record Debt Servicing:** Developing nations spent **\$1.4 trillion** on foreign debt – highest ever.
4. **Revenue Strain:** **54+ countries** spent $\geq 10\%$ govt. revenue on interest; half in Africa.
5. **Credit Rating Bias:** Africa lost **\$24 bn excess interest** + **\$46 bn forgone lending** due to unfair ratings (UNDP).
6. **LMIC Burden:** In 2023, LMICs paid **\$368 bn external debt service**, 2× a decade ago.

National Character of Indian Science

Recent Context -

India celebrates a record **100,000+ patents in 2023–24**, but concerns remain about lack of cutting-edge innovation, global collaboration, and critical introspection—echoing Al-Biruni's millennium-old critique of intellectual insularity.

About -

1. **Patent Boom:** Over **100,000 patents** granted in **2023–24**, nearly **3× previous year**.
2. **Al-Biruni's Critique (11th c.):** Praised Indian science but noted **insularity** in *Kitab al-Hind*.
3. **6G Ambitions:** Bharat 6G Alliance aims for **10% global 6G patents**, despite lag in 5G rollout.
4. **Global Competition:** China already leads 6G standards via **ITU framework**.
5. **Science–Religion Link:** IIA & CSIR-CBRI contributed to **Surya Tilak in Ayodhya** (blend of astronomy & symbolism).
6. **Weakness:** Focus on **patent numbers**, not basic research or institutional capacity.

Strengthening Wildlife Protection Laws in India

Recent Context -

Despite robust frameworks like the **Wild Life (Protection) Act, 1972**, India faces rising **illegal wildlife trade**, trafficking networks, and zoonotic risks,

necessitating stronger legal integration and community-based conservation measures.

About -

1. **Key Incident:** Smuggling of **50+ reptiles** (e.g., spider-tailed horned viper) at Mumbai airport.
2. **Pangolin Case:** Schedule I (WLPA), Appendix I (CITES); **5,772 seized (2009–17)**; **90% decline in 3 generations**.
3. **Targeted Species:** Slender loris, parakeets, spiny-tailed lizards, Indian softshell turtles.
4. **Health Risk:** Illegal trade linked to zoonoses like **Ebola, M-pox, COVID-19**.
5. **Legal Framework:** WLPA 1972, FCA 1980, EPA 1986; **2022 WLPA amendments** aligned with CITES.
6. **Reform Measures:** Integrate WLPA with **Customs Act, Biodiversity Act, FSSA, Arms Act, Nyaya Sanhita**.
7. **Community Role:** Local haats monitoring, **eco-tourism livelihoods**, enforcing **Animal Market Rules, 2018**.

Supreme Court Recognises Oran Lands as Forests

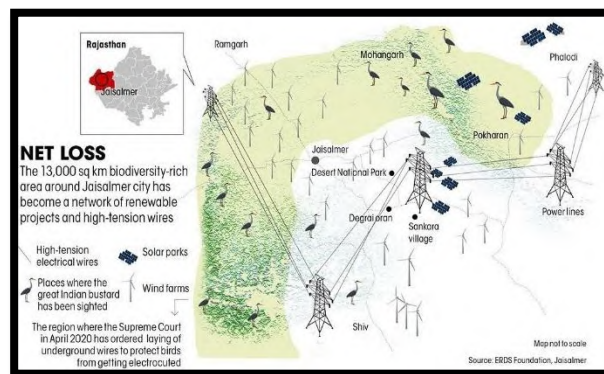
Recent Context -

In **T.N. Godavarman vs Union of India**, the Supreme Court recognised **Oran lands of Rajasthan** as 'forests' under the **Forest Conservation Act, 1980**, strengthening community-centric conservation and legal protection.

About -

1. **Definition:** Orans = community-managed **sacred groves**, dating back to **pre-agrarian societies**.
2. **Extent:** Rajasthan has **25,000 Orans** spanning **0.6 million hectares**.
3. **Functions:** Support grazing, recharge aquifers, sustain springs, biodiversity, and livelihoods.
4. **Threats:** Misclassified as **wastelands**, diverted for renewable energy projects.
5. **Legal Tools:** Can be declared **Community Reserves (WLPA, 1972)**; CFR rights under **FRA, 2006**.
6. **Implementation Gap:** Only **48.95% FRA claims** granted; Rajasthan: **3,000 titles of 5,000 claims**.

7. **Forest Diversions: 17,000 projects (2008–23)** diverted **0.3 million ha** under FCA, highlighting urgency.



Rethinking India's Poverty Metrics

Recent Context -

India's poverty metrics rely on the **2023 Consumption Expenditure Survey**. Using the World Bank's revised poverty line (\$3/day), extreme poverty declined from **27.1% (2011–12)** to **5.3% (2022–23)**.

About -

1. **Old Benchmark:** \$2.15/day (PPP, 2017) → updated to **\$3/day (PPP, 2021)**.
2. **India's Decline:** Poverty fell from **27.1% (2011–12)** to **5.3% (2022–23)**.
3. **People Lifted:** **171 million** exited extreme poverty in a decade.
4. **Still Poor:** **54.6 million** Indians live under \$3/day in 2024.
5. **Global Impact:** Despite global poor rising to **838 mn**, **South Asia only region with decline**, driven by India.
6. **Survey Source:** **2023 Consumption Expenditure Survey** (first since 2011–12).
7. **Method Shift:** Govt. now prefers **NITI Aayog's Multidimensional Poverty Index** (education, health, living standards).

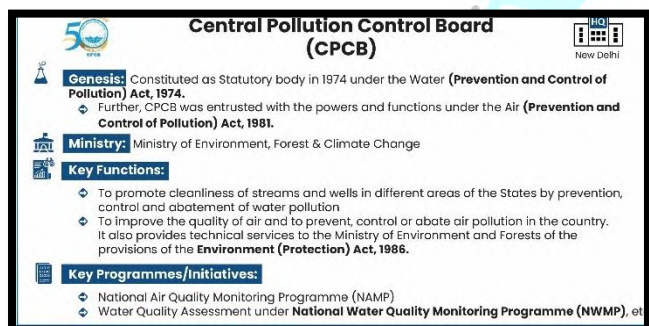
Central Pollution Control Board (CPCB)

Recent Context -

Established under the **Water Act, 1974**, CPCB regulates pollution control across India. Recent reforms like **Industrial Classification-2025** and digital tools strengthen oversight, but staff shortages and funding gaps persist.

About -

1. **Statutory Basis:** Formed under **Water (Prevention & Control of Pollution) Act, 1974**; powers extended by **Air Act, 1981** and **EPA, 1986**.
2. **Core Functions:** Sets standards, monitors air & water, coordinates with SPCBs, issues directions, raises awareness.
3. **Monitoring Programs:** **NAMP** (air pollutants in 262 cities); **MINARS & GEMS** (200 rivers, 60 lakes, 321 groundwater stations).
4. **New Framework (2025): Classification-2025** → reclassified 419 industries, introduced **Blue Category** (e.g., CBG plants, biomining).
5. **Digital Tools:** **Sameer App** (real-time AQI); Compendium on alternatives to single-use plastics.
6. **Eco-City & LiFE:** Expanded **Eco-City program**; launched **Ecomark Scheme** with BIS for eco-friendly products.
7. **Challenges:** **50% vacancies**, weak SPCB coordination, outdated infrastructure, inadequate funding, no annual reports since **2020–21**.



Construction and Demolition (C&D) Waste Rules, 2025

Recent Context -

India generates **150+ million tonnes of C&D waste annually**, mostly unprocessed. The new **C&D Waste Rules, 2025** (effective April 1, 2026) aim to enforce recycling, segregation, and circular construction practices.

About -

1. **Origin:** Builds on **C&D Waste Rules, 2016**; revised to strengthen recycling mandates.
2. **Scope:** Applies to projects **>300 sq. m.**, making bulk waste generators responsible for recycling & reuse.

3. **Key Features:** **Mandatory segregation**, **GPS tracking** of disposal vehicles, penalties for illegal dumping.
4. **Incentives:** Tax benefits for using recycled materials in infrastructure & public projects.
5. **Current Gap:** **No mandatory use of recycled aggregates** in structural applications; weak eco-demolition standards.
6. **Circular Construction Needs:** Push for **deconstruction**, public procurement of recycled materials, lifecycle-based approvals.
7. **Future Steps:** Amending building codes, training engineers, promoting green construction, incentivising material recovery.

Global Hunger Hotspots

Recent Context -

The **FAO-WFP Hunger Hotspots Report (2024)** identified **18 hotspots in 22 countries**, with 5 regions at *highest concern*, driven by conflict, climate shocks, economic instability, and displacement.

About -

1. **Highest Concern Regions:** Sudan, South Sudan, Burkina Faso, Haiti, Mali.
2. **Main Driver:** Conflict = leading cause in **12 of 13 most critical hotspots**.
3. **Climate Impacts:** Droughts, floods, erratic rains → crop loss (notably South Sudan, Haiti).
4. **Economic Shocks:** Inflation, currency collapse, trade disruptions → reduced food access.



5. **Funding Gap:** UN requires **\$12.2 bn**, only **9% secured** for aid.
6. **Operational Barriers:** Security risks, bureaucracy, damaged infrastructure → aid delivery blocked.

7. **Global Action Urged:** Emergency food aid, resilient agriculture, peacebuilding, humanitarian access.

Guidelines on Disposal of Expired and Unused Medicines (CDSCO)

Recent Context -

The **CDSCO** issued India's first national guidelines (2024) for safe disposal of expired/unused medicines to curb **AMR, environmental pollution, and health hazards** from improper pharmaceutical waste handling.

About -

1. **Regulator: Central Drugs Standard Control Organization (CDSCO)** – under Ministry of Health & Family Welfare.
2. **Flush List:** Limited to potent opioids → prevent accidental poisoning.
3. **Eco-Friendly Methods:** Encapsulation, inertisation, incineration encouraged.
4. **Segregation & Returns:** Pharmacies, hospitals, households must segregate; **Return-to-Pharmacy programs** promoted.
5. **Ban:** Flushing medicines in toilets/drains strictly prohibited.
6. **Disposal Chain:** Only **licensed biomedical waste handlers** authorised for final disposal.

Capping MGNREGS Spending

Recent Context -

The govt. is considering **budgetary caps on MGNREGS**, raising concerns over reduced rural employment, especially for **tribal communities** in states like Jharkhand, Odisha, Chhattisgarh, and Madhya Pradesh.

About -

1. **Legal Basis: MGNREG Act, 2005** – guarantees **100 days of wage employment** to rural households.
2. **Tribal Dependency:** Key livelihood source in forested/remote tribal belts; ensures **wages, food security, debt reduction**.
3. **Community Assets:** Funds **water harvesting structures, forest paths**, ecological works aiding tribal livelihoods.

4. **Impact of Caps:** Less work availability → **forced migration, poverty rise**.
5. **Wage Issues:** Chronic **delayed payments**, disproportionately affecting tribals and marginalised groups.
6. **Governance Gap:** **Low tribal participation** in planning & monitoring → exclusion from decision-making.

Banks Pledged \$869BN to Fossil Fuel Firms in 2024

Recent Context -

A 2024 report found **60 largest global banks** financed **\$869 billion** to fossil fuel firms, undermining **Paris Agreement climate pledges** and net-zero targets despite worsening climate warnings.

About -

1. **Total Financing:** \$869 bn in **2024** → nearly pre-pandemic levels.
2. **Top Financiers:** JPMorgan Chase, Citi, Bank of America, Barclays.
3. **Expansion Projects:** \$142 bn → new exploration, pipelines, LNG terminals.
4. **Regional Split:** North America = ~50%; Europe shifted to LNG/offshore oil; Asia (China, Japan) boosted coal support.
5. **Contradiction:** Funds flow despite **Paris Agreement & net-zero commitments**.
6. **Sectors Funded:** Oil, gas, coal, LNG infrastructure.
7. **Reform Demands:** **Mandatory climate disclosures, stress tests, divestment campaigns**, policy reforms for green-aligned banking.

Green India Mission (2021–30)

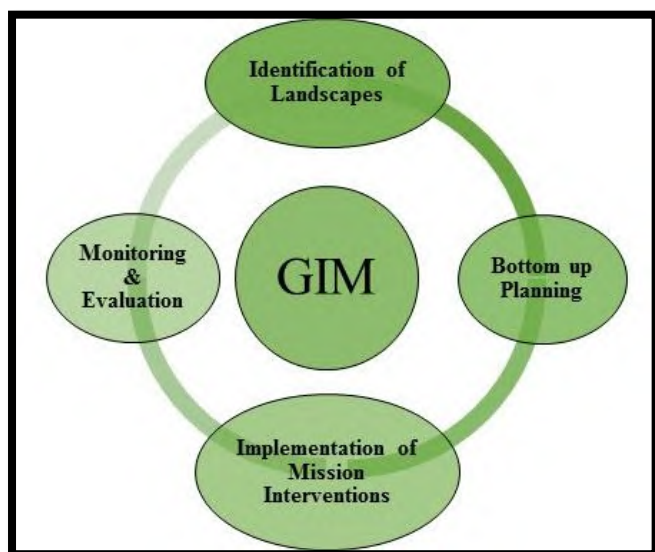
Recent Context -

MoEF&CC released the revised **Green India Mission (2021–30)** targeting restoration of **Aravallis, Western Ghats, mangroves, and Himalayas**, aiming for **carbon sink creation, livelihood support, and biodiversity protection**.

About -

1. **Target Carbon Sink:** 3.39 billion tonnes through forest/tree cover expansion.

2. **Forest Cover Goal:** 5 million ha on forest + non-forest land.
3. **CO₂ Sequestration:** Annual 50–60 million tonnes by 2030.
4. **Livelihood Impact:** Support to 3 million forest-dependent households.
5. **Sub-Missions:** Forest restoration, afforestation, agro/social forestry, livelihood diversification.
6. **Implementation:** JFMCs, GIS-based tracking, audits, National Afforestation Dashboard.
7. **New Focus Areas:** Aravallis, Western Ghats, mangroves, arid zones, degraded grasslands.



Ground-Level Ozone

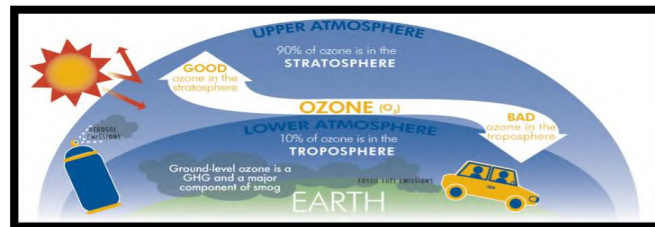
Recent Context -

CSE reported **ground-level ozone breached safety limits almost daily (Mar–May 2025)** in NCR, driven by **NO_x-VOC reactions, heat, stagnant air**, worsening urban smog and health risks.

About -

1. **Nature:** 'Bad ozone' = **secondary pollutant**, unlike protective stratospheric ozone.
2. **Formation:** **NO_x + VOCs + sunlight** → **O₃** (high temps/stagnant air aid).
3. **Sources:** Vehicles, industries, petrol pumps, solvents, biomass/waste burning.
4. **Health Effects:** Respiratory distress, aggravated asthma/heart disease, long-term lung damage.
5. **Environmental Effects:** Major component of **urban smog**, damages crops & ecosystems.

6. **Govt Measures:** **BS-VI norms**, EV push (PM-E Drive), stricter industrial standards, Vapour Recovery at pumps.
7. **Policy Framework:** **NCAP** (130 non-attainment cities, city-level plans).



A980 – Extreme Helium (EHe) Star

Recent Context -

IIA, Bengaluru discovered **A980**, a rare **Extreme Helium (EHe) star** in **Ophiuchus (25,800 light years away)** — showing first-ever **Germanium (Ge II) detection**, advancing stellar nucleosynthesis research.

About -

1. **Discovery:** Using **Hanle Echelle Spectrograph** on Himalayan Chandra Telescope.
2. **Unique Feature:** First EHe star with **singly-ionized Germanium (Ge II) lines**.
3. **Ge Abundance:** **8× higher than the Sun**.
4. **Formation:** Merger of **Carbon-Oxygen WD + Helium-rich WD**.
5. **Process Indicated:** Active **s-process nucleosynthesis** (neutron-capture element formation).
6. **Rarity:** Only a **few dozen EHe stars** known globally.
7. **Significance:** Improves understanding of **late stellar evolution and element creation**.

Draft Guidelines – Discarded Solar PV Modules (CPCB)

Recent Context -

CPCB issued **draft guidelines** for handling, storage, and recycling of discarded **solar PV modules**, under **E-Waste Rules, 2022**, as India's solar capacity crosses **110 GW**.

About -

1. **Projected Waste:** **1.8 million tonnes** solar waste by 2030.
2. **Risks:** Leaching of **glass, silicon, heavy metals** → soil & water pollution.

3. **EPR Mandate:** Producers must **collect & recycle** through authorized channels.
4. **Storage Protocol:** Safe storage until **2034–35**, as per CPCB norms.
5. **Recycling:** Only **licensed recyclers** can recover silver, glass, silicon.
6. **Challenges:** High recycling cost, lack of infrastructure, low awareness.
7. **Policy Push:** **MNRE's RE-RTD program** prioritizes PV recycling R&D.

United Nations Ocean Conference (UNOC3, 2025)

Recent Context -

UNOC3 (Nice, France) focused on accelerating **SDG-14**, adopting the **Nice Ocean Action Plan**, with pledges on **high seas treaty**, **coral reef conservation**, **deep-sea mining moratorium**, and **blue finance**.

About -

1. **Goal:** Advance **SDG-14 – Life Below Water**.
2. **High Seas Treaty:** **50 ratifications** (needs 60 for enforcement).
3. **Key Pledges:** EU (€1 bn), Germany (€100 mn), Coral Bond (Indonesia + World Bank).
4. **Marine Protected Areas:** New reserves including **world's largest** in French Polynesia.
5. **Deep-Sea Mining:** Call for **moratorium** – “The abyss is not for sale.”
6. **Funding Gap:** Needs **\$175 bn/year by 2030**; current shortfall ~ \$14.6 bn.
7. **Future:** Next UNOC in **2028 (Chile & South Korea)**.

Global Fund for Coral Reefs (GFCR)

Recent Context -

Mass coral bleaching and biodiversity loss have heightened urgency for the **GFCR**, which seeks to mobilize **\$3 billion by 2030** for global reef protection and resilience.

About -

1. **Launch:** Established in **2020** as the world's **first blended finance instrument** for coral reefs.
2. **Target:** Protect **3 million hectares** of reefs, leveraging **\$3 bn by 2030**.
3. **Structure:**

- **UN Grant Fund** → catalytic funding for reef initiatives.
- **Equity Investment Fund** → invests in reef-positive businesses.

4. **Recent Funding:** \$25 mn new grants across **23 nations**; **Egyptian Red Sea Initiative (\$50 mn)**; **NZ pledged \$10 mn at COP16**.
5. **Coral Status:** **14% global reef loss (2009–18)** — area larger than the Great Barrier Reef.
6. **Bleaching Crisis:** **4th global mass bleaching (2024)** → 80% reefs under severe thermal stress.
7. **Significance:** Coral reefs = home to **25% marine species** + support livelihoods of **1 bn people**.

SOURCE – INDIAN EXPRESS

UN – Growing Threat to Oceans

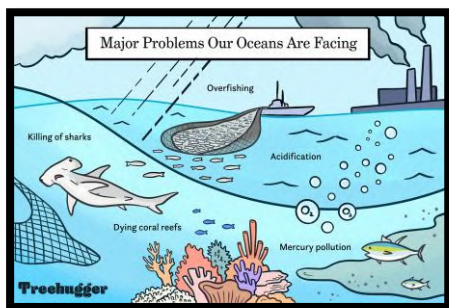
Recent Context -

At the **3rd UN Ocean Conference (2025)** coinciding with **World Oceans Day**, the UN declared ocean degradation a **global emergency**, urging nations to act against pollution, warming, overexploitation, and maritime disasters.

About -

1. **Coverage:** Oceans cover **71% of Earth's surface**, sustain **94% of life**, act as **largest carbon sink & climate regulator**.
2. **Major Threats:** Warming seas, sea-level rise, plastic pollution, ship accidents, coral bleaching, acidification, cyclones.
3. **Heat Absorption:** Oceans absorb **90% of excess climate heat**, causing salinity changes + deoxygenation.
4. **Coral Bleaching:** Rising SST kills symbiotic algae in corals → turning them white & fragile.
5. **Polar Impact:** Arctic & Antarctic → more **ice-free days** due to warming oceans.
6. **India's Maritime Challenges:** Coastal vulnerability (cyclones, erosion, SLR), impacts on **Blue Economy & trade security**.
7. **Geopolitics:** India faces China's **“String of Pearls”** strategy in the Indian Ocean →

pushing India to strengthen maritime security & sustainable ocean use.



Ecological Restoration in India

Recent Context -

On **World Environment Day 2025**, the PM emphasized ecological restoration through the **Ek Ped Maa Ke Naam campaign** and the **Aravalli Green Wall Project** to combat large-scale land degradation.

About -

1. **Aravalli Green Wall Project** → aims to restore India's oldest mountain range degraded by deforestation, mining, urbanization, and agriculture.
2. **Biodiversity Decline** → Extinction rates now **10–100x higher** than natural; **IUCN Red List**: 1 million species threatened.
3. **Indian Laws & Programs**:
 - Wildlife Protection Act, Forest Conservation Act.
 - National Afforestation Programme, Green India Mission.
 - RVP (Rainfed Area Development Programme).
4. **Polluter Pays Principle** → Supreme Court recognizes liability of industries for ecological degradation.
5. **Global Parallel** → **EU Nature Restoration Law (2024)** → binding targets to restore forests, wetlands, rivers, grasslands, marine & freshwater ecosystems.
6. **UN Initiatives** → **UN Decade on Ecosystem Restoration (2021–2030)** + Kunming-Montreal Global Biodiversity Framework (30x30 target).

SOURCE – PIB

India's Renewable Rise – Non-Fossil Sources Cross 50% Installed Capacity

Recent Context -

India achieved a **historic milestone** in June 2025: **50.08% of its power capacity from non-fossil sources**, surpassing its **2030 Paris NDC target five years early**, showcasing global climate leadership.

About -

1. **Installed Mix (2025)**: 484.82 GW total → **RE + Large Hydro 48.27%**, Nuclear 1.81%, Thermal 49.92%.
2. **Clean Energy Share**: Non-fossil = **242.78 GW (50.08%)**; includes Solar, Wind, Bioenergy, Hydro & Nuclear.
3. **Flagship Schemes**: **PM-KUSUM** (solar pumps, agrovoltaics), **PM Surya Ghar** (1 crore rooftop solar homes), **National Wind-Solar Hybrid Policy**.
4. **Global Leadership**: One of few **G20 nations** on track/exceeding **Paris NDCs**; advocates **climate equity** at COPs & G20.
5. **Green Hydrogen Mission**: Future-ready fuel for **hard-to-abate sectors** (steel, fertiliser, refining).
6. **Targets**: **500 GW non-fossil by 2030**, **Net Zero by 2070**; focus on **AI-driven smart grids**, **BESS**, and **circular economy recycling**.

New Lichen Species – *Allographa effusosoredica* in Western Ghats

Recent Context -

In July 2025, scientists at **Agharkar Research Institute, Pune**, discovered ***Allographa effusosoredica***, India's **first molecularly confirmed *Allographa* lichen**, showcasing ancient fungal-algal symbiosis and biodiversity richness of the **Western Ghats**.

About -

1. **Species**: *Allographa effusosoredica* – a **crustose lichen** with effuse soredia aiding dispersal.
2. **First-of-its-kind**: India's **first *Allographa*** confirmed through **molecular sequencing**.
3. **Symbiosis**: Lichen = **fungus (mycobiont) + alga Trentepohlia (photobiont)**.

4. **Methods: Polyphasic taxonomy** – morphology, chemistry (norstictic acid), molecular markers (mtSSU, LSU, RPB2 for fungus; ITS for alga).
5. **Ecological role:** Soil formation, nutrient cycling, **bioindicators** of air quality & climate.
6. **Biodiversity significance:** 53rd Allographa in India, **22nd from Western Ghats**; shows **microendemism**.
7. **Western Ghats: UNESCO World Heritage Site**, global biodiversity hotspot; urgent need for **molecular exploration of lichen biota**.

SOURCE – VISION MONTHLY

Topic: CSS – Integrated Development of Wildlife Habitats (IDWH) Scheme

Recent Context -

In 2025, **Gharial and Sloth Bear** were recommended for inclusion under the **Species Recovery Programme** of the **CSS-IDWH scheme**, expanding conservation efforts for critically endangered and vulnerable species.

About -

1. **Nodal Ministry:** Ministry of Environment, Forest and Climate Change (MoEFCC).
2. **Type:** Centrally Sponsored Scheme (CSS).
3. **Objective:** Financial support to States/UTs for **Protected Areas, wildlife outside PAs, and recovery of endangered species/habitats**.
4. **Coverage:** Supports **National Parks, Wildlife Sanctuaries, Conservation & Community Reserves**.
5. **Species Recovery Programme:** 22 species already covered – incl. **Snow Leopard, Asiatic Lion, Great Indian Bustard, Gangetic Dolphin**.
6. **Key Components:** Development of **Wildlife Habitats, Project Tiger, Project Elephant**.
7. **Recent Additions Proposed:** **Gharial (Critically Endangered, aquatic crocodilian)** and **Sloth Bear (Vulnerable, termite-eating bear of India-Nepal-Sri Lanka)**.

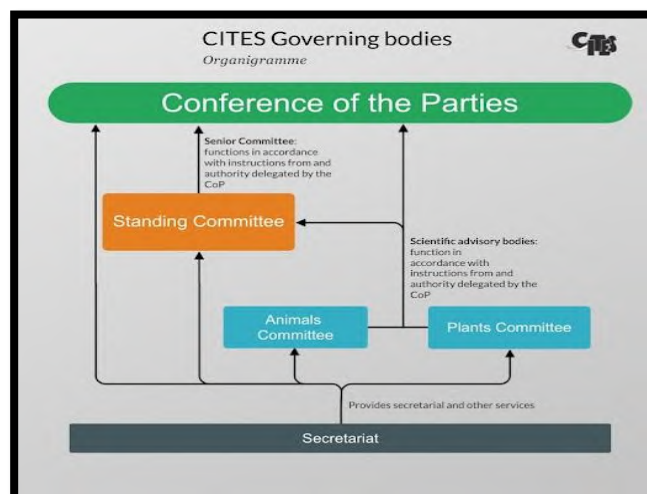
Topic: Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

Recent Context -

In 2025, **CITES marks its 50th anniversary** since entering into force (1975), reaffirming its role in regulating global wildlife trade and safeguarding biodiversity against overexploitation.

About -

1. **Genesis:** Conceived at **IUCN (1963)**, came into force in **1975**.
2. **Aim:** Voluntary international agreement ensuring **trade in wild fauna & flora does not threaten their survival**.
3. **Secretariat:** Administered by **UNEP**, located in **Geneva, Switzerland**; IUCN provides scientific support.
4. **Membership: 185 Parties** (India ratified in 1976); implemented through **domestic laws** (e.g., WPA 1972).
5. **Decision-making body: Conference of Parties (CoP)** – CoP3 was hosted by **India (New Delhi, 1981)**.
6. **Key Initiatives:**
 - **MIKE Programme** (Monitoring Illegal Killing of Elephants) – India sites: *Chirang-Ripu, Dihing Patkai*.
 - **ICCWC (2010):** Global collaboration against wildlife crime.
 - **CITES Tree Species Programme (CTSP)**.
7. **Coverage:** Regulates trade in **40,000+ species** via **Appendices I, II, III**; uses **licensing system** for import/export/re-export.



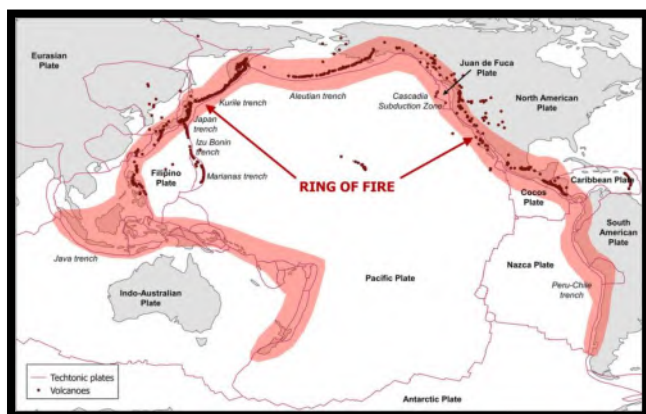
Topic: Pacific Ring of Fire (Circum-Pacific Belt)

Recent Context -

In 2025, a **magnitude 8.8 earthquake near Russia's Kamchatka Peninsula**, part of the **Pacific Ring of Fire**, triggered tsunami waves across Russia and Japan, highlighting tectonic vulnerability.

About -

1. **Definition:** Horseshoe-shaped belt of **seismic & volcanic activity** encircling the Pacific Ocean (~40,000 km).
2. **Significance:** Accounts for **90% of world's earthquakes** and **75% of active volcanoes**.
3. **Tectonic Plates:** Includes **Pacific, Juan de Fuca, Cocos, Nazca, Indian–Australian, North American, Philippine Plates**.
4. **Geographic Features:** Mountains, **island arcs**, **deep trenches (e.g., Mariana Trench)**, fertile volcanic soils.
5. **Causes:**
 - **Subduction zones** (volcanism, quakes).
 - **Transform faults** (e.g., San Andreas).
 - **Divergent ridges** (e.g., East Pacific Rise).
 - **Hotspots** (mantle plumes).
6. **Resources:** **40% of global geothermal energy**; rich in **gold, copper, molybdenum**.
7. **Agriculture:** Volcanic soils highly fertile → supports crops like **rice, coffee**.



Draft Rules for Carbon Credit Trading Scheme (CCTS)

Recent Context -

MoEFCC issued **Draft Greenhouse Gas Emission Intensity Target Rules, 2025** under CCTS, mandating binding emission targets for 400+ industries,

advancing India's carbon pricing framework and global climate commitments.

About -

1. **Definition:** GEI = tonnes of CO₂ equivalent per unit output/product.
2. **Coverage:** Aluminium, steel, petroleum refining, petrochemicals, textiles, etc.
3. **Target setting authority:** **Bureau of Energy Efficiency (BEE)**.
4. **Legal backing:** **Energy Conservation (Amendment) Act, 2022**.
5. **Compliance mechanism:** Obligated entities get Carbon Credit Certificates if emissions < target.
6. **Trading regulator:** **Central Electricity Regulatory Commission (CERC)**.
7. **Penalty:** Non-compliance → fines under **Environment (Protection) Act, 1986**.

Environment Protection (Management of Contaminated Sites) Rules, 2025

Recent Context -

MoEFCC notified new **Contaminated Site Management Rules, 2025** under EPA 1986, mandating identification, polluter liability, and remediation funding for hazardous sites, addressing India's legacy pollution challenge.

About -

1. **Coverage:** 189 hazardous substances (as per Hazardous Waste Rules, 2016).
2. **Exclusions:** Radioactive waste, mining, oil spills at sea, solid waste dumps.
3. **Identification:** Local bodies/Districts → SPCB → CPCB online portal.
4. **Polluter Pays:** Polluter/new landowner liable for cleanup costs.
5. **Remediation Funding:** Govt funds initial assessment via **Environmental Relief Fund (PLI Act, 1991)**.
6. **Response levels:** Separate for agriculture, residential, commercial, industrial land.
7. **Penalty:** SPCB can impose fines for failure to remediate, especially when health risks exist.

Global Wetland Outlook 2025

Recent Context -

The **Secretariat of Ramsar Convention** released *Global Wetland Outlook 2025*, warning of accelerated wetland loss, aligning its strategic goals with **Kunming-Montreal Global Biodiversity Framework (KM-GBF) targets*.

About -

1. Coverage: Inland freshwater, coastal, marine wetlands = **1,800 million ha**.
2. Loss: **22% of wetlands lost since 1970**.
3. Africa: Most degraded wetlands globally.
4. Alignment: Ramsar strategic goals ↔ **KM-GBF targets**.
5. Threats: Unplanned urbanisation, industry, infrastructure.
6. Case: **Regional Flyway Initiative** – restoring 140+ wetlands across Asia.
7. Innovation: **Seychelles Blue Bond** – world's first sovereign blue bond.

Uttarakhand – Tourist Carrying Capacity (Nainital District)

Recent Context -

Uttarakhand govt begins **tourist carrying capacity survey** in Nainital to manage unregulated tourism, as directed by **NGT (Sept 2024)**, balancing ecological sensitivity with development aspirations.

About -

1. Definition: **Carrying Capacity** = **maximum population threshold an area can sustain**.
2. Factors: Biotic (vegetation, hydrology) + Abiotic (terrain, climate).
3. Approaches: **Planetary Boundaries** (global crises) & **Biocapacity Overshoot** (resource use).
4. Example: **Earth Overshoot Day** → when humanity exceeds annual ecological budget.
5. NGT 2024: Directed classification of Nainital by carrying capacity.
6. Importance: Supports sustainable development via precautionary principles.
7. Application: Guides eco-sensitive tourism in fragile regions.

ICJ Advisory Opinion on Climate Change (2025)

Recent Context -

The **International Court of Justice (ICJ)**, on request of UNGA 2023 (led by Vanuatu), ruled that states have binding obligations to prevent climate harm, especially for **SIDS**.

About -

1. Clean, healthy environment = **Human Right** (linked to UDHR).
2. States obliged to **limit GHG emissions**.
3. Paris Agreement: Keep warming ≤ **1.5°C**.
4. Non-compliance: States incur **legal responsibility**.
5. Remedies: **Cessation, non-repetition, reparation**.
6. Backing: Supported by **130+ countries**, led by **Vanuatu**.
7. Opposition: **US & Russia** resisted court-mandated emission cuts.

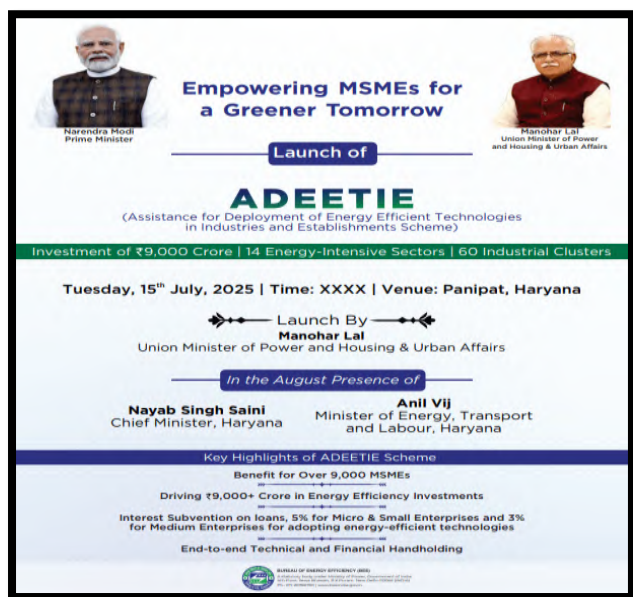
ADEETIE Scheme (2025)

Recent Context -

The Ministry of Power launched the **ADEETIE Scheme** to promote energy-efficient technologies in MSMEs, aiming at **30–50% energy savings**, green energy corridor creation, and reduced power-to-product ratios.

About -

1. **Full Form**: Assistance in Deploying Energy Efficient Technologies in Industries & Establishments (ADEETIE).
2. **Ministry**: Ministry of Power.
3. **Nodal Agency**: Bureau of Energy Efficiency (BEE).
4. **Duration**: 3 years (**FY 2025-26 to FY 2027-28**).
5. **Budget**: ₹1000 crore.
6. **Coverage**: 14 energy-intensive sectors; phased roll-out (60 clusters → 100 more).
7. **Benefits**: Interest subvention (5% for Micro/Small, 3% for Medium), technical handholding, Investment Grade Energy Audits.



Human-Made Dams & Earth's Poles

Recent Context -

A new study shows that construction of large reservoirs since 1835 has shifted Earth's rotation axis by over 1 metre, driving **True Polar Wander (TPW)** through inland water redistribution.

About -

1. TPW = planetary reorientation of Earth's crust & mantle around liquid outer core.
2. Natural causes: glacial melt, tectonic shifts, ocean swells.
3. Dams trap water inland → mass redistribution.
4. Pole shift not uniform → depends on dam size & location.
5. Navigation issues for satellites & telescopes.
6. Longer days recorded due to pole shift.
7. First time human activity (dams) linked directly with TPW.

Winter Fog Experiment (WiFEX)

Recent Context -

WiFEX completed 10 years of dedicated fog research in North India, improving **fog forecasting models** and now-casting accuracy for aviation, transport, and public safety during dense winter fog events.

About -

1. Launched by Ministry of Earth Sciences (MoES).

2. Implemented by Indian Institute of Tropical Meteorology.
3. Focus: long-term open-field fog study.
4. Aim: 0–6 hrs “now-casting” of fog.
5. Location: Indira Gandhi International Airport, Delhi.
6. First of its kind global experiment dedicated solely to fog.
7. Helps transport safety, disaster management, and aviation planning.

Kariyachalli Island

Recent Context -

Kariyachalli Island in Tamil Nadu's **Gulf of Mannar** has sunk significantly due to sea-level rise and erosion. Restoration attempts underway through reef modules and seagrass plantations under **TNSHORE project**.

About -

1. Location: Gulf of Mannar Marine National Park, TN.
2. Part of India's first marine biosphere reserve.
3. Facing severe erosion & submergence.
4. TNSHORE = Tamil Nadu Sustainably Harnessing Ocean Resources project.
5. Restoration: artificial reefs & seagrass.
6. Supports endangered marine species like dugongs.
7. Critical for coastal protection & livelihood fisheries.

Chenab River

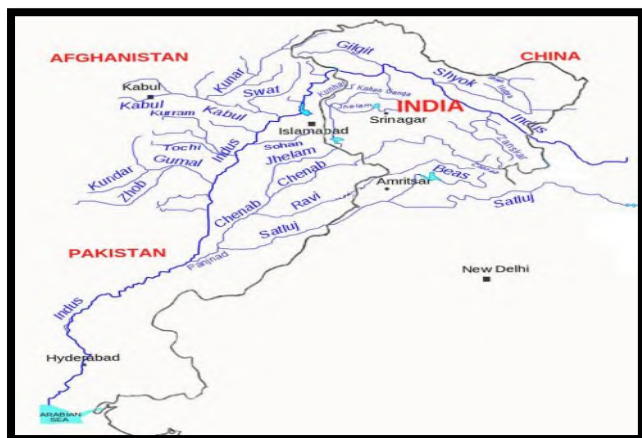
Recent Context -

Forest Advisory Committee approved diversion of land for **Sawalkot HEP** on Chenab River, one of six strategic hydropower projects to optimise India's share of Indus waters under the Indus Treaty.

About -

1. Origin: Bara Lacha Pass, Himachal Pradesh.
2. Formed by Chandra & Bhaga streams.
3. Vedic name: Chandrabhaga (also Ashkini/Iskmati).
4. Tributaries: Miyar, Thiror, Marusudar, Lidrari etc.
5. Valley formed between Great Himalayas & Pir Panjal.

- Part of Indus River System → flows into Pakistan.
- Sawalkot HEP: major hydroelectric project approved.



Tokara Islands (Japan)

Recent Context -

Tokara Islands, south of Kyushu, Japan, recently experienced over **1,000 earthquakes**, highlighting the seismic vulnerability of the Pacific “Ring of Fire” tectonic region.

About -

- Archipelago south of Kyushu, north of Amami.
- Part of Kagoshima Prefecture, Japan.
- Lies on Pacific Ring of Fire.
- Frequent earthquakes & volcanic activity.
- Toshima village = Japan’s longest village.
- Biodiversity-rich subtropical islands.
- Important for disaster management studies.

Bitra Island (Lakshadweep)

Recent Context -

Lakshadweep administration may acquire **Bitra Island**, the smallest inhabited island in the UT, for defence use, highlighting its **strategic maritime importance** in the Arabian Sea.

About -

- Smallest inhabited island of Lakshadweep.
- Area: 0.105 sq km.
- Location: near Agatti Island.
- Climate: Tropical savannah (Aw – Köppen).
- Avg rainfall: ~1600 mm annually.
- Lakshadweep: 36 islands (atolls, lagoons, reefs).
- India’s smallest UT by area & population.



SOURCE – INSIGHTS

All India Tiger Estimation (AITE) – Small Cats Report

Recent Context -

On Global Tiger Day 2025, MoEFCC released the first-ever report “Status of Small Cats in Tiger Landscapes of India,” based on 2018 & 2022 AITE, mapping 9 small cat species.

About -

- Released by:** MoEFCC on 29 July 2025 (Global Tiger Day).
- Scope:** Covers 9 small wild cats using AITE 2018 & 2022 data.
- Most widespread:** Jungle Cat (96,275 km²), resilient to disturbance.
- Rare species:** Marbled Cat, Asiatic Golden Cat, Clouded Leopard → NE India forests.
- Habitat specialist:** Fishing Cat depends on wetlands, mangroves (Terai, NE).
- Caracal:** Not detected in the survey (historically in NW & Central India).
- Significance:** Validates Project Tiger’s umbrella effect → protected areas benefit wider biodiversity.

Tracking India’s Climate Goals

Recent Context -

India has achieved a major milestone by ensuring over 50% of installed electricity capacity comes from non-fossil fuel sources in 2025, five years ahead of its Paris Agreement target.

About -

- Paris NDCs (2030):** 50% non-fossil fuel electricity capacity, 45% emission intensity

reduction (2005 baseline), additional 2.5–3 billion tonnes CO₂ sink.

2. **Installed Capacity:** 484.82 GW total, 242.78 GW (50.1%) non-fossil (hydro, nuclear, solar, wind).
3. **Carbon Sink:** Added 2.29 billion tonnes by 2021; annual ~150 MtCO₂ increase (as per ISFR).
4. **Emission Intensity:** 36% reduction achieved by 2020; on track for 45% by 2030.
5. **Reality Check:** Non-fossil fuels in *electricity generation* ≈ 28%; in *total energy consumption* ≈ 6%.

Model Rules for Felling Trees in Agricultural Lands

Recent Context -

In 2025, MoEFCC released Model Rules to simplify tree felling, registration, and timber transport on agricultural lands, promoting agroforestry, climate action, and rural livelihoods while reducing legal hurdles.

About -

1. **Purpose:** Streamlined framework for plantation registration, felling, and timber transport from non-forest agricultural lands; aligns with National Agroforestry Policy 2014.
2. **NTMS Portal:** Mandatory digital registration of plantations and harvest requests for traceability and ease of access.
3. **Felling Process:**
 - <10 trees: Photo upload → auto NOC.
 - 10 trees: Online application, field verification, permit issuance.
4. **State-Level Committee (SLC):** Multidisciplinary panel ensures regulation, promotion, and monitoring of agroforestry activities.
5. **Third-Party Verification:** Empanelled forestry agencies certify plantations' eligibility for felling and transit.
6. **Tech-Enabled Monitoring:** GPS, geotagged photos, and satellite imagery track growth, timber projections, and transparency.

Bonn Climate Talks 2025

Recent Context -

Bonn Climate Talks 2025, held in June, laid groundwork for COP30. Limited progress made amid disagreements over finance, adaptation metrics, equity, loss and damage, and gender-inclusive just transition.

About -

1. **What & Where:** Mid-year UNFCCC Subsidiary Bodies meeting; held in Bonn, Germany; prepares technical groundwork for annual COP summit.
2. **Global Goal on Adaptation (GGA):** 490/9,000 indicators shortlisted; India supported context-specific metrics over uniform global benchmarks.
3. **Mitigation Work Programme (MWP):** Agreed as non-punitive, facilitative; Brazil proposed digital hub; EU warned against duplication.
4. **Loss & Damage (L&D):** Integration into NDCs discussed; funding gaps and Santiago Network implementation remain unresolved.
5. **Climate Finance ('Baku to Belém'):** Initiated talks for \$1.3 trillion/year; disputes over grants vs loans, mitigation vs adaptation priorities.
6. **Just Transition & Gender Action Plan:** Emphasis on equity-based transitions, labour rights; disagreements on terminology and framework scope.

UNEP Frontiers Report 2025 – “The Weight of Time”

Context:

UNEP warns that intensified river and coastal flooding could remobilize long-buried toxic chemicals, threatening ecosystems and human health.

Key Findings:

1. **Legacy Pollutants:** Floodwaters stir heavy metals (cadmium, lead) & POPs from sediments.
2. **Health Risks:** Exceeding cadmium limits in rivers like Ganga, Hindon, Vaigai → cancer, kidney damage, reproductive issues.
3. **Global Case Studies:**

- Hurricane Harvey (2017) → mercury in Galveston Bay.
- Niger Delta floods (2012) → PAHs remobilized.
- 4. **Obsolete Pesticides:** Pakistan 2010 floods released 2,835 MT pesticides.
- 5. **Active Chemical Sources:** 4.8–7 million tonnes of POP waste in landfills globally.
- 6. **Climate Link:** More intense floods increase toxic release.
- 7. **Bioaccumulation:** Pollutants enter aquatic food chains → humans affected.
- 8. **Persistence:** Many banned chemicals remain active for decades.

Centre's Exemption Policy for Thermal Plants

Context:

MoEFCC exempts 78% of India's thermal power plants from Flue Gas Desulphurisation (FGD) systems to reduce SO₂ emissions, based on pollution risk and location.

About -

1. **Policy Basis:** Scientific advisory panel under Principal Scientific Adviser.
2. **Classification:** Plants divided into three categories based on location and pollution levels.
3. **Category A (11%):**
 - Near NCR or cities >1 million population → strict FGD compliance.
4. **Category B & C (rest 78%):**
 - Exemptions allowed if air quality and pollution thresholds met.
5. **Objective:** Balance pollution control with economic feasibility for power sector.
6. **Implications:**
 - Critics argue environmental risks may increase.
 - Supports energy security without overburdening smaller plants.

Glacial Lake Outburst Floods (GLOFs)

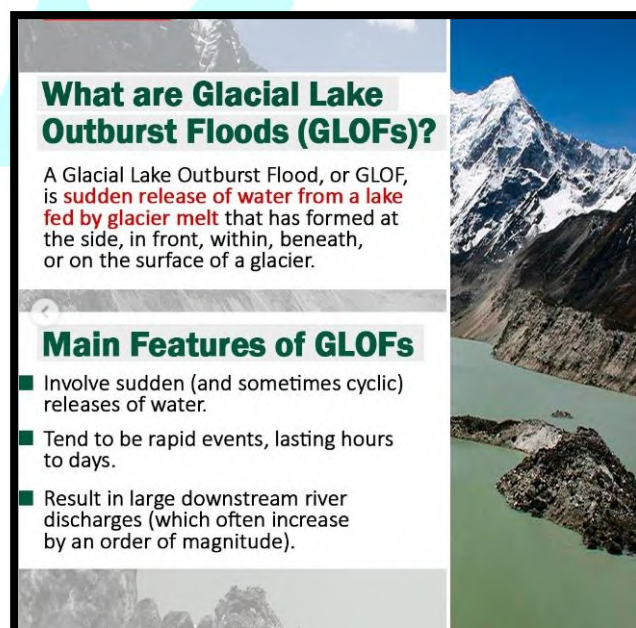
Recent Context:

July 2025 Nepal GLOFs destroyed bridges and

hydropower projects; warming Himalayas increase risk in Sikkim, Ladakh, and Uttarakhand.

About -

1. **Definition:** Sudden release of glacial lake water due to moraine/ice dam failure.
2. **Causes – Natural:** Glacial retreat, avalanches, heavy rainfall, seismic activity, internal seepage.
3. **Causes – Anthropogenic:** Climate change and unregulated construction near glacial zones.
4. **Types of Lakes:** Supraglacial (on glaciers) & moraine-dammed (at glacier snouts).
5. **Impacts:** Loss of life, damage to hydropower & infrastructure, riverbed silting, habitat disruption.
6. **NDMA Strategy:** Hazard assessment, automated weather/water stations, early warning systems, engineering interventions, community involvement.
7. **India's Measures:** SAR interferometry, ERT, UAV/bathymetric surveys, local community engagement, cross-border data sharing.



Drought Hotspots Around the World 2023–2025

Recent Context:

UNCCD & U.S. NDMC report highlights worsening droughts globally, affecting Africa, Latin America, Mediterranean, and Asia, with severe socioeconomic and ecological impacts.

About -

1. **Global Escalation:** Africa, Mediterranean, Latin America, Asia face intensifying droughts.
2. **Humanitarian Impact:** 90M+ in Eastern/Southern Africa face hunger; child marriages and school dropouts rise.
3. **Energy Crisis:** Zambezi River low flows caused power blackouts in Zambia.
4. **Economic Impact:** Spain's olive oil output fell 50%; Panama Canal transits disrupted.
5. **Ecological Loss:** Amazon & Zimbabwe saw river dolphins and elephants die; riverbed changes.
6. **India-specific:** Monsoon variability, hydrological stress in Godavari/Krishna basins, crop failures, farmer distress.
7. **Drivers & Mitigation:** Climate change, El Niño, overextraction; solutions include early warning systems, nature-based solutions, gender-sensitive adaptation, transboundary cooperation.

SOURCE – DRISHTI

River Pollution in India

Recent Context (2025, 30 words):

Delhi govt. prioritizes Yamuna cleanup under Namami Gange Programme; aligns local efforts with national Ganga rejuvenation, tackling industrial, agricultural, and cultural pollution to restore water quality, biodiversity, and community engagement.

About -

1. **Causes:** Industrial effluents, agricultural runoff, idol immersion, plastic dumping, thermal/radioactive pollution, climate-induced low flows.
2. **Key Rivers Polluted:** Ganga, Yamuna, Damodar, Sutlej, Mithi.
3. **Namami Gange Pillars:** Nirmal Ganga (pollution abatement), Aviral Ganga (flow/ecology), Jan Ganga (people-river connect), Gyan Ganga (research & policy).
4. **Implementation Structure:** National Ganga Council (PM), Empowered Task Force, NMCG, State & District Ganga Committees.

5. **Achievements:** STP capacity ↑30x; BOD improved (UP 10–20 → 3–6 mg/l); Gangetic dolphin sightings increased.
6. **Global Recognition:** UN Decade on Ecosystem Restoration (2021–2030) ranked NGP among Top 10 World Restoration Flagship Initiatives.

World Bioproduct Day 2025 & BioE3 Policy

Recent Context -

DST, BIRAC, and iBRIC+ organized World Bioproduct Day 2025 highlighting equity, environment, and economy, reiterating India's target of a USD 300 billion bioeconomy by 2030 under BioE3 policy.

About -

1. **World Bioproduct Day:** Launched 2021 by World Bioeconomy Forum; promotes bio-based products for sustainability and climate action.
2. **Bioproducts:** Fuels, materials, chemicals from renewable biomass (e.g., biofuels, bioplastics, plant-based medicines).
3. **iBRIC+:** Expands Indian Bioeconomy Research & Innovation Consortium; strengthens regional biotech ecosystems and interdisciplinary R&D.
4. **BioE3 Policy (2024):** Focus on Economy, Environment, Employment; promotes sustainable biomanufacturing and circular bioeconomy.
5. **Core Sectors:** Bio-based chemicals, smart proteins, precision therapeutics, climate-resilient agriculture, carbon capture, marine/space biotech.
6. **Government Support:** Biomanufacturing hubs, workforce expansion, ethical biosafety, and global regulatory alignment.

UNFCCC Reform Call Ahead of COP30

Recent Context -

Ahead of COP30 in Brazil, global discussions emphasize UNFCCC reforms due to weak implementation, voluntary NDCs, climate finance gaps, consensus challenges, and inequitable climate justice for vulnerable nations.

About -

1. **UNFCCC:** Adopted 1992, entered into force 1994; 198 parties; aims to stabilize GHGs and prevent dangerous climate interference.
2. **Principles:** Common but Differentiated Responsibilities (CBDR) and equity among nations.
3. **Institutional Structure:** COP (supreme body), SBSTA & SBI (subsidiary bodies), Secretariat in Bonn, Global Innovation Hub.
4. **Major Agreements:** Kyoto Protocol (legally binding targets), Paris Agreement (voluntary NDCs, 1.5–2°C goal).
5. **Implementation Gaps:** Weak enforcement, underfunded Loss & Damage Fund, voluntary NDCs, delayed climate finance.

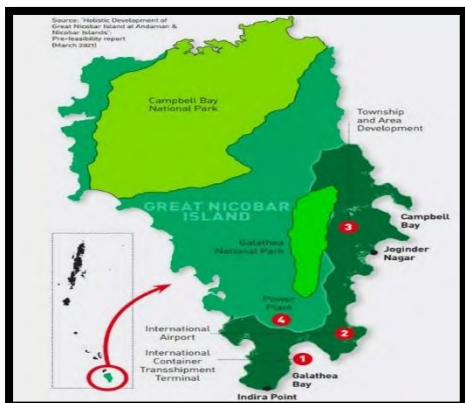
Great Nicobar Project

Recent Context -

IIT-Kanpur report flags **high seismic and tsunami risks** for the ₹72,000-crore Great Nicobar Infrastructure Project, contradicting the EIA's low-risk assessment, raising environmental, geological, and tribal concerns.

About -

1. **Location:** Southernmost Andaman & Nicobar, near Malacca Strait.
2. **Key Components:** Greenfield airport, transshipment terminal, township, tourism project.
3. **Strategic Significance:** Supports Act East Policy, QUAD Indo-Pacific strategy.
4. **Seismic Risk:** Mega-earthquake return period 420–750 years; large quake 80–120 years.
5. **Environmental Concern:** 130 sq km rainforest clearance; threat to leatherback turtles.



Bonn Climate Change Conference 2025

Recent Context -

The 62nd Bonn Climate Conference reviewed climate action implementation, adaptation goals, and finance issues ahead of COP30, emphasizing fair transition, Loss & Damage, and strengthened NDC commitments.

About -

1. **Organiser:** UNFCCC; mid-year session (SBSTA & SBI).
2. **Global Goal on Adaptation:** Draft 100 indicators; enhance resilience.
3. **Just Transition Work Programme:** Belém Action Mechanism for fair climate transition.
4. **National Climate Plans:** Many countries missed updated NDC deadlines.
5. **Climate Finance:** Developing countries demand public funding; USD 1.3 trillion/year till 2030.
6. **Loss & Damage Fund:** Progress slow; remains under discussion.
7. **Link to COP30:** Sets agenda for next UN climate negotiations.

India's Air Pollution Crisis

Recent Context -

Study finds **secondary pollutants**, especially ammonium sulphate, contribute one-third of PM2.5; coal power plants emit 60% of SO₂, but only 8% have Flue Gas Desulphurisation systems installed.

About -

1. **Primary Pollutants:** Directly emitted, e.g., CO, CO₂, SO₂, NO_x, DDT, plastics.
2. **Secondary Pollutants:** Formed via reactions of primary pollutants, e.g., ammonium sulphate, peroxyacetyl nitrate (PAN).
3. **Particulate Matter:** PM10 (<10µm) and PM2.5 (<2.5µm); PM2.5 majorly from vehicles, industry, power plants.
4. **Health Impact:** Respiratory diseases, higher mortality, ecosystem damage.
5. **Air Quality Measures:** NCAP, GRAP (Delhi), Commission for Air Quality Management, SAFAR portal.

6. **FGD Purpose:** Removes SO₂ from coal/oil emissions to prevent acid rain; protects crops, infrastructure, soil, aquatic systems.
7. **FGD Types:** Dry Sorbent Injection, Wet Limestone, Seawater-based systems.

SOURCE – THE HINDU

ICJ Climate Ruling Reshapes India's Policy Debate

Recent Context :

On 23 July 2025, ICJ issued an advisory opinion declaring climate change an existential threat. Though non-binding, it influences India's policy, balancing development, climate duty, and global expectations.

About -

1. **India's Response:** Strategic neutrality; neither supported nor opposed Vanuatu's ICJ case due to developmental constraints.
2. **Development vs. Climate:** Per capita emissions low; focus on electricity, healthcare, jobs; many still use biomass for cooking.
3. **Domestic Climate Action:** 50% electricity from renewables by 2030; falling emissions intensity, afforestation, electric buses in major cities.
4. **Global Leadership:** Leads International Solar Alliance, Mission LiFE; climate finance agenda via G20 presidency.
5. **Legal Significance:** ICJ bases duties on climate treaties, human rights law, UN Charter, law of the sea; emphasizes prevention, adaptation, cooperation.
6. **Equity & Rights:** Recognizes rights to life, health, housing; affirms common but differentiated responsibilities (CBDR).

M.S. Swaminathan's Vision Transformed Mangrove Conservation Globally

Recent Context -

Mangroves are now globally recognised for climate adaptation, disaster mitigation, and biodiversity, thanks to M.S. Swaminathan's advocacy since the 1980s, shaping policy, research, and restoration practices worldwide.

About -

1. **Tokyo Address (1989):** Highlighted sea-level rise, salinisation, and food-security risks; advocated sustainable mangrove management.
2. **Three-Pillar Framework:** Combined ecology, economics, and equity; promoted using mangrove genes for salt-tolerant crops.
3. **ISME Leadership:** Founded International Society for Mangrove Ecosystems (1990–93) to drive global advocacy and research.
4. **Global Conservation Tools:** Co-authored Charter for Mangroves (incorporated in 1992 World Charter for Nature); developed GLOMIS database.
5. **India's Scientific Restoration:** MSSRF introduced "fishbone canal method" for mangrove restoration; widely adopted by state governments.
6. **Disaster Mitigation:** Mangroves proved protective during 1999 Odisha cyclone and 2004 tsunami, reinforcing their ecological and social value.

International Court Declares Climate Action a Legal Global Obligation

Recent Context -

On 25 July 2025, the ICJ issued an advisory opinion declaring climate action a legal obligation under international law, emphasizing accountability for countries and private actors failing to reduce emissions.

About -

1. **Legal Basis:** ICJ referenced UNFCCC (1994), Kyoto Protocol (1997), Paris Agreement (2015) – climate action is legally binding, not optional.
2. **Additional Treaties:** UNCLOS, Montreal Protocol, CBD, and UNCCD reinforce climate-related obligations.
3. **Developed Country Responsibility:** Annex I countries must lead emission reductions and support developing nations via finance and technology.
4. **State Liability for Private Actors:** Governments can be held accountable if they

fail to regulate environmentally harmful corporate activities.

5. **Consequences of Non-Compliance:** Non-fulfillment constitutes internationally wrongful acts; affected states can claim full reparation, recognizing “loss and damage.”

Climate Change Displacing and Redefining Coastal Indian Lives

Recent Context -

Rising seas, erosion, and unregulated coastal development in India are displacing communities, threatening livelihoods, and pushing migrants into vulnerable urban labour markets without adequate legal protections or social support.

About -

1. **Rising Seas & Submerged Villages:** Satabhaya (Odisha) and other settlements face submergence; relocation often to poorly equipped colonies.
2. **Loss of Traditional Livelihoods:** Fishing, farming, and mangrove-dependent livelihoods are threatened by salinity, erosion, and port/tourism projects.
3. **Urban Migration & Vulnerabilities:** Displaced populations move to cities like Chennai, Bhubaneswar, and Mumbai, entering informal, precarious work.
4. **Labour Exploitation:** Migrants face debt bondage, lack of labour rights, and gendered exploitation in informal sectors.
5. **Weak Legal & Policy Frameworks:** No specific law addresses slow-onset climate displacement; CRZ 2019 and environmental laws prioritize development over community protection.
6. **Grassroots Resistance:** Local movements (**Save Satabhaya, Pattuvam Mangroves**) (mobilize communities but face criminalisation and state pushback).
7. **Rights-Based Adaptation Needed:** Policies must secure housing, healthcare, education, labour protections, and uphold democratic values in line with SDG 8.7.

China's Green Energy Revolution and Global Leadership

Recent Context -

In 2024, China installed more solar and wind capacity than the rest of the world combined, cementing global leadership in green energy through state planning, SOEs, and strategic investments.

About -

1. **Policy-Driven Transition:** Renewable Energy Law (2005) and 11th Five-Year Plan elevated clean energy to national priority with subsidies, grid guarantees, and incentives.
2. **Massive Investment:** Green energy investment grew from \$10.7 billion in 2006 to \$940 billion in 2024; India received \$3.4 billion in 2024–25.
3. **Pollution & Energy Security:** Severe air pollution and energy import dependence drove urgent clean energy adoption.
4. **Role of SOEs:** State-owned enterprises like State Grid, Huaneng, and Genertec executed large-scale solar and wind projects domestically and abroad.
5. **Global Expansion:** SOEs operate in 61 countries, exporting technology, constructing hydropower and wind projects, and enhancing China's technological influence.
6. **Future Technologies & Global Influence:** China targets AI smart grids, green hydrogen, and thorium reactors, competing with Western countries to set global energy rules.



1. **Mangrove Restoration in India** – Protects coasts, supports biodiversity, and mitigates climate change.
2. **Forest Governance Challenges** – Gram Sabhas' authority crucial for decentralized, people-centric forest management.
3. **Power Corridors for Great Indian Bustard** – Rerouted power lines reduce bird collision risks in critical habitats.
4. **Great Hornbill Sighting in Kerala** – Rare coastal sighting indicates ecosystem health and biodiversity.
5. **India Achieves 50% Non-Fossil Fuel Power Capacity** – Half of electricity capacity now from renewable, hydro, and nuclear sources.
6. **India's Carbon Credit Trading Scheme** – Market-based mechanism to reduce GHG emissions and meet NDC targets.
7. **Climate Change Fueling Wildfires in Europe** – Extreme heat and dry conditions intensify wildfire frequency and damage.
8. **ICJ Climate Ruling** – Countries have legal obligations to reduce emissions and support climate-affected nations.
9. **Swachh Survekshan Awards** – Recognizes urban cleanliness, innovation, and sanitation excellence across cities.
10. **Ambrosia Beetle & Fungal Threat to Kerala Rubber Plantations** – Invasive beetle-fungi combo threatens rubber trees and latex yield.
11. **First-Ever Grassland Bird Census in Kaziranga Tiger Reserve** – AI and acoustic monitoring track endangered grassland birds.
12. **Environment Protection (Management of Contaminated Sites) Rules 2025** – Establishes legal framework for contaminated site remediation.
13. **District Flood Severity Index** – Measures district-level flood impacts for better disaster planning.
14. **E-Mobility / India Electric Mobility Index (IEMI)** – Benchmarks EV adoption, infrastructure, and R&D across states.
15. **Wise Use of Wetlands – India's Resolution at Ramsar COP15** – Promotes sustainable wetlands management and citizen engagement.
16. **Cloudbursts in Himalayan Regions** – Extreme rainfall events cause flash floods and landslides, worsened by climate change.
17. **Global Outlook Council on Water Investments (GOCWI)** – Mobilizes global finance for sustainable water security.
18. **Pollution Control Boards – Environmental Compensation** – Empowers PCBs to enforce "Polluter Pays Principle" for remediation.
19. **UNDP Equator Initiative Award – Bibi Fatima SHG** – Recognizes community-led biodiversity conservation and climate-resilient farming.
20. **Awaza Programme of Action (APoA) 2024–2034** – Framework for development, trade, and climate resilience in landlocked countries.
21. **GLP-1 Drugs (Semaglutide, Tirzepatide)** – Mimic incretin hormones to control blood sugar and promote weight loss.
22. **India's First Tribal Genome Sequencing Project** – Sequencing tribal genomes for personalized healthcare and disease risk analysis.

23. **Confined Field Trials of GM Maize** – Testing insect-resistant and herbicide-tolerant maize under controlled conditions.
24. **Stem Cell Therapy ‘Zimislecel’ in Type-1 Diabetes** – Lab-grown islet cells restore insulin production in T1D patients.
25. **Caltech Angstrom-Scale Microscope** – Non-invasive real-time imaging of molecules at atomic resolution.
26. **Axiom-4 Mission – India’s Participation** – Indian astronaut conducts experiments aboard the ISS on a private mission.
27. **DRDO Photonic Radar** – Light-based radar with high-resolution, stealth detection, and jam-proof capabilities.
28. **HAM Radio – Space & Earth Communication** – Amateur radio used for education and emergency communication from space.
29. **PARAM-1 – India’s Foundational LLM** – India’s first open-source Hindi-English AI model for local applications.
30. **India’s First Private Heavy Water Upgrade Facility** – Decentralised testing and purification for nuclear reactor use.
31. **Climate-Smart Fabrics** – Adaptive clothing for heat, UV protection, and thermal comfort.
32. **Vitamin D Deficiency & Neurodevelopmental Issues** – Low maternal/infant vitamin D linked to ADHD, autism, schizophrenia.
33. **Pralay Missile System** – Short-range precision missile with manoeuvrable re-entry capabilities.
34. **Astra BVRAAM** – Beyond-visual-range air-to-air missile with indigenous guidance.
35. **Akash Prime Air Defence System** – Medium-range mobile SAM with high-altitude capability.
36. **INS Nistar – Indigenous Diving Support Vessel** – Supports submarine rescue and deep-sea operations.
37. **Apache AH-64E Helicopters** – Advanced attack helicopters for close air support and anti-tank operations.
38. **Patriot Missile Defence System** – Mobile surface-to-air system intercepting aircraft and missiles.
39. **India’s Space Programme** – Satellites and missions enhancing governance, defence, agriculture, and disaster management.
40. **India’s First Commercial EO Satellite Constellation** – Private consortium for Earth observation and geospatial applications.
41. **ISRO HOPE Analog Mission (Ladakh)** – Simulates Moon/Mars-like conditions for astronaut training and experiments.
42. **ISRO Lunar Module Launch Vehicle (LMLV) by 2035** – Heavy-lift rocket to support human lunar missions.
43. **EU AI Code of Practice on GPAP** – Voluntary AI guidelines covering transparency, safety, and copyright.
44. **Brain-Computer Interface (BCI)** – Enables direct brain-device communication with privacy protections.
45. **Annual FASTag Pass** – RFID-based toll payment simplifying highway travel.
46. **Maharashtra Hyperloop Project** – High-speed low-pressure tube transport connecting JNPT to Vadhavan Port.
47. **SHRESTH Initiative** – Index benchmarking state drug regulatory performance.
48. **AI Sovereignty in India** – Developing independent AI capabilities for security, economy, and local language access.
49. **Need for National Space Law** – Legal framework to regulate private, commercial, and international space activities.
50. **Bharatiya Antariksh Station (BAS)** – Planned Indian space station for long-duration missions and research.
51. **Semiconductor Industry in India** – Expanding fabs and design capabilities to reduce import dependence.
52. **NASA Lunar Nuclear Reactor** – Nuclear power on the Moon for sustainable lunar habitats.
53. **India’s Energy Landscape & Electricity Security** – Expanding renewables, nuclear, and grid stability for rising demand.
54. **AI in India’s IT Sector** – Transforming productivity, automation, and workforce skills in IT.
55. **Sustainable Aviation Fuel (SAF)** – Biofuel for aviation reducing GHG emissions.

- 56. **E. coli Bio-Sensors** – Genetically engineered bacteria for environmental and chemical sensing.
- 57. **Hepatitis D Virus (HDV)** – Defective virus causing liver disease, dependent on HBV.
- 58. **Biofortified Potatoes** – Iron-rich crops to combat nutritional deficiencies.
- 59. **Zoonotic Diseases** – Monitoring animal-to-human diseases to prevent pandemics.
- 60. **India's First Private Heavy Water Testing Facility** – Ensures nuclear fuel safety and operational efficiency.



ENVIRONMENT & DISASTER MANAGEMENT**SOURCE – THE HINDU****TOPIC - mangrove restoration in India**

Recent Context : July 26 marks International Day for Mangrove Conservation. M.S. Swaminathan pioneered mangrove restoration in India, linking ecological protection, livelihoods, and climate adaptation, and established global mangrove management frameworks.

ABOUT-

1. **Mangrove Features:** Halophytes, aerial roots (pneumatophores), vivipary, buttress/prop roots; found in estuaries, lagoons, deltas.
2. **Ecological Importance:** Coastal protection, carbon sink ("blue carbon"), biodiversity hotspot, water purification.
3. **Indian Mangrove Cover:** 4,991.68 sq km (ISFR 2023); net increase of 16.68 sq km since 2019.
4. **Contributions of M.S. Swaminathan:** Advocated Joint Mangrove Management (JMM), fishbone canal method, mangrove-based salt-tolerant crops.
5. **Global Impact:** Co-founded ISME, Charter for Mangroves, Global Mangrove Database, Mangrove Genetic Resource Centres.
6. **Climate Adaptation:** Highlighted mangroves' role against cyclones, tsunamis, rising sea levels.
7. **Regional Names:** Sundari Forest (West Bengal), Tivar Forest (Gujarat), Kandal Forests (Kerala).

Topic: Forest Governance Challenges in India

Recent Context : Chhattisgarh Forest Department attempted to take control of Community Forest Resource Rights (CFRR) under FRA 2006, violating Gram Sabha authority; grassroots resistance highlighted the need for decentralised forest governance.

ABOUT-

1. **FRA 2006:** Recognizes individual, community, habitat, and cultural rights of STs and OTFDs.
2. **Community Forest Resource Rights (CFRR):** Authority vested in Gram Sabhas, not forest departments.

3. **Individual Forest Rights:** Up to 4 hectares, heritable, non-transferable.
4. **Cultural & Intellectual Rights:** Recognition of traditional knowledge, spiritual sites, biodiversity practices.
5. **Challenges:** Colonial forestry legacy, top-down working plans, bureaucratic resistance to decentralisation.
6. **Way Forward:** Uphold FRA, phase out NWPC for CFR areas, capacity building for Gram Sabhas.
7. **Goal:** People-centric, ecologically sensitive forest management prioritizing local governance.

Topic: Power Corridors for Great Indian Bustard (GIB) Conservation

Recent Context : Supreme Court panel proposed rerouting power lines in Gujarat and Rajasthan to protect the critically endangered Great Indian Bustard, preventing collisions in high-risk habitats amid conservation breeding programs.

ABOUT-

1. **Species Info:** One of heaviest flying birds, males/females similar size, males have black crown & band.
2. **Habitat:** Open grasslands with minimal obstruction; avoids dense scrub or tall grass.
3. **Distribution:** Rajasthan, Gujarat; small populations in Maharashtra, Karnataka, Andhra Pradesh.
4. **Threats:** Collision with power lines, hunting, fast vehicles, free-ranging dogs, habitat loss, mechanized agriculture, industrialisation.
5. **Conservation Status:** IUCN Critically Endangered, Wildlife Protection Act 1972 Schedule I, CITES Appendix I.
6. **Government Efforts:** Protected areas, species recovery program, conservation breeding (Rajasthan, Gujarat, Maharashtra), satellite breeding facility in Jaisalmer.
7. **Significance of Power Corridors:** Reduce bird mortality by minimizing hazardous overhead electrical infrastructure.

Great Hornbill – Rare Sighting in Coastal Kerala

Recent Context : In a rare event, the Great Hornbill was sighted in Kannur's coastal belt, Kerala, highlighting the ecological value of the region and its potential as an indicator of ecosystem health.

ABOUT-

1. **Species Info:** Large hornbill, 95–130 cm, 2–4 kg; males with red eyes, females bluish-white.
2. **Habitat:** Evergreen and moist deciduous forests; Western Ghats and Northeast India; rare in coastal zones.
3. **India's Hornbill Species:** 9 species; Narcondam Hornbill (endemic, IUCN Endangered) found only on Narcondam Island.
4. **Diet:** Predominantly frugivorous; occasionally eats small mammals, reptiles, and birds.
5. **Behaviour:** Secondary cavity nesters; reuse same tree cavities for nesting.
6. **Threats:** Habitat loss, hunting for meat, fat, casque, feathers, and medicinal use.
7. **Conservation Status:** IUCN Vulnerable, Wildlife Protection Act 1972 Schedule I, CITES Appendix I.



Topic: India Achieves 50% Non-Fossil Fuel Power Capacity

Recent Context : India achieves 50% installed electricity capacity from non-fossil sources (242.8 GW of 484.8 GW) five years ahead of its 2030 target, driven by renewable, hydro, and nuclear energy.

ABOUT-

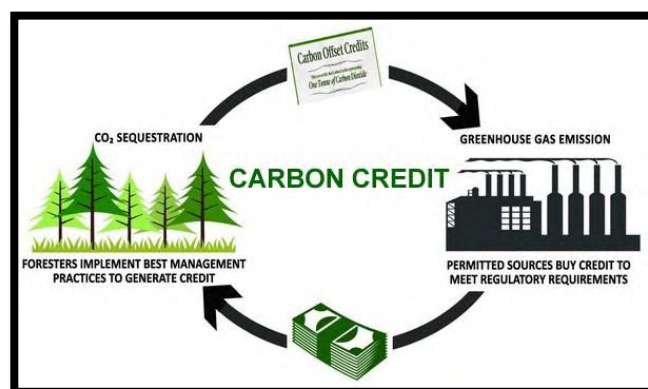
1. **Installed Capacity (June 2025):** Thermal 242.04 GW (49.92%), Non-Fossil Fuel 242.78 GW (50.08%).
2. **Sources:** Large hydro, nuclear, wind, solar. Solar added ~24 GW in 2024.
3. **Electricity vs Energy Basket:** Electricity ~22% of total energy consumption; non-fossil electricity ~6% of total energy use.
4. **Climate Commitments:** 50% electricity from non-fossil fuels by 2030, reduce GDP emission intensity by 45%, create 2.5–3 Bt CO₂ additional carbon sink.
5. **Flagship Programs:** PM-KUSUM, PM Surya Ghar, Solar Parks, National Wind-Solar Hybrid Policy.
6. **Future Targets:** 500 GW non-fossil capacity by 2030; nuclear capacity expansion to 17 GW.

Topic: India's Carbon Credit Trading Scheme (CCTS)

Recent Context : India launched Carbon Credit Trading Scheme in 2023 under the Energy Conservation (Amendment) Act 2022 to reduce GHG emissions via carbon pricing and market-based trading.

ABOUT-

1. **Mechanisms:**
 - **Compliance:** Energy-intensive industries must meet sectoral GHG targets; surplus earns Carbon Credit Certificates (CCC).
 - **Offset:** Voluntary emission reductions outside compliance framework earn credits.



2. **Covered Sectors:** Aluminium, Cement, Paper & Pulp, Chlor-Alkali, Iron & Steel, Textiles, Petrochemicals, Petroleum Refineries.
3. **Administration:** Bureau of Energy Efficiency (BEE) and National Steering Committee for Indian Carbon Market.
4. **Trading Start:** Expected October 2026.
5. **Objective:** Achieve NDC target of 45% GDP emission intensity reduction by 2030 from 2005 levels.
6. **Assessment:** Targets currently less ambitious; only 1.68% annual reduction vs required 2.53% in manufacturing; sectoral coverage limited.

SOURCE – INDIAN EXPRESS

Climate Change Fueling Wildfires in Europe

Recent Context : Wildfires in Mediterranean Europe (Spain, France) have burned over 2.2 lakh hectares in 2025, more than double the 20-year average, linked to heatwaves and climate change.

ABOUT-

1. **Key Trend:** Wildfires surged due to hotter summers, dry vegetation, and strong winds.
2. **Climate Change Factor:** Europe warming twice as fast as global average since 1980s; feedback loops exacerbate aridity.
3. **Arctic Influence:** Proximity contributes to soaring European summer temperatures.
4. **Jet Stream Changes:** Double jet streams create high-pressure zones, causing extreme heat.
5. **Mediterranean Climate:** Hot, dry summers; cool, wet winters; vegetation adapted with hard, waxy leaves.
6. **Heatwaves:** More frequent and intense, linked to anthropogenic greenhouse gas emissions.
7. **Impact:** Forced evacuations, environmental and economic losses.

Topic: ICJ Climate Ruling – Advisory Opinion

Recent Context : ICJ advised that climate action is a **legal obligation**, not a policy choice; countries could

be held liable for failing to reduce emissions and support climate-affected nations.

ABOUT-

1. **Legal Obligation:** Countries must reduce greenhouse gas emissions; non-compliance may require reparations.
2. **Developed Countries:** Annex I nations must lead mitigation and support developing countries financially and technologically.
3. **Private Sector:** Governments liable for insufficient regulation of private actors causing emissions.
4. **Loss & Damage:** Supports claims for full reparation, not just compensation.
5. **Paris Agreement Link:** Contrasts voluntary NDC approach; ICJ stresses sufficient-scale action.
6. **Enforcement:** Advisory opinion – not binding, but influential on international and national courts.
7. **Significance:** Empowers developing nations, strengthens legal basis for climate litigation.

Topic: Swachh Survekshan Awards 2024–25

Recent Context : President of India conferred Swachh Survekshan awards recognizing urban cleanliness, sanitation, and innovation across cities, as part of Swachh Bharat Mission-Urban (SBM-U).

ABOUT-

1. **Launched:** 2016; Nodal Ministry: MoHUA; coverage: 4589 cities.
2. **Assessment Criteria:** Waste management, public toilets, citizen awareness, innovation, citizen feedback.
3. **Top Cities:** Ahmedabad (>10 L), Mira Bhayandar (3–10 L).
4. **Special Recognition:** Super Swachh League for consistent top performers (Indore, Surat, Navi Mumbai, Vijayawada).
5. **Other Awards:** Best Ganga Town – Prayagraj; Lucknow – 7-star Garbage Free City.
6. **New Initiatives:** Swachh City Partnership Initiative; Accelerated Dumpsite Remediation Program (2025–26).

7. **Goal:** Encourage mentorship, innovation, and scientific waste management in urban India.

Topic: Ambrosia Beetle & Fungal Threat to Kerala Rubber Plantations

Recent Context : Ambrosia Beetle with fungi *Fusarium* ambrosia and *F. solani* threatens Kerala's rubber plantations, potentially causing tree death and reduced latex production; invasive species management is crucial.

ABOUT-

1. **Species:** Ambrosia Beetle – invasive, native to Central & South America; first reported in India in 2012 (Goa).
2. **Mutualism:** Carries *Fusarium* fungi that weaken trees, feed larvae.
3. **Damage:** Fungi block xylem, reduce water flow, kill trees, reduce latex yield.
4. **Affected Plants:** Rubber, coffee, cashew, mango, coconut, teak; >80 broadleaf species.
5. **Control Challenges:** Fungi reside deep in tree tissues; chemical treatments often ineffective.
6. **Management:** Remove infected parts, use microbial consortia, antagonistic fungi, possibly GM rubber plants.
7. **Economic Significance:** Kerala produces 90% of India's rubber; India 4th largest producer globally.

Topic: First-Ever Grassland Bird Census in Kaziranga Tiger Reserve

Recent Context : Acoustic monitoring and AI used to survey grassland birds in Kaziranga Tiger Reserve to protect endemic and globally threatened species amid 70% grassland loss in Assam.

ABOUT-

1. **Methodology:** Passive acoustic recorders + AI (Birdnet) to identify species during breeding season (March–May).
2. **Species Prioritized:** Bengal Florican (CR), Swamp Francolin, Finn's Weaver, Jerdon's Babbler, Black-breasted Parrotbill, Marsh Babbler, etc.
3. **Results:** 43 species recorded; 1 Critically Endangered, 2 Endangered, 6 Vulnerable.

4. **Habitat Threats:** Overgrazing, cultivation, climate change, ecological succession.
5. **Grassland Significance:** Indicator of ecosystem health; supports rare/endemic species.
6. **Technology Use:** Spectrogram analysis, AI bird song recognition improves survey efficiency.
7. **Conservation Goal:** Inform habitat management and restore grasslands for bird conservation.



Environment Protection (Management of Contaminated Sites) Rules 2025

Recent Context :

Union Ministry of Environment notified rules under the Environment (Protection) Act, 1986, establishing India's first legal framework to identify, assess, and remediate chemically contaminated sites, ensuring environmental safety and accountability.

ABOUT-

1. **Legal Basis:** Environment (Protection) Act, 1986; first formal framework for contaminated sites.
2. **Aim:** Comprehensive legal procedure to manage chemically contaminated land.
3. **Definition:** Sites affected by chemical/hazardous waste – landfills, dumps, storage/treatment sites, spill areas.
4. **Current Status:** 103 sites identified; remedial action started in only 7.
5. **Identification & Assessment:** District administration reports; State Board provides preliminary assessment in 90 days; detailed survey in 3 months.

6. **Remediation & Responsibility:** Reference organisation prepares remediation plan; responsible persons bear cost; otherwise, Centre/State fund clean-up.
7. **Legal Liability:** Criminal liability under **Bharatiya Nyaya Sanhita (2023)** if contamination causes loss of life/damage.

District Flood Severity Index (DFSI)

Recent Context :

IIT Delhi and IIT Gandhinagar developed the District Flood Severity Index to measure flood impact at the district level, aiding disaster planning and supporting SDG 13 and Sendai Framework goals.

ABOUT-

1. **Purpose:** Granular district-level flood risk assessment; complements IMD, CWC, NDMA efforts.
2. **Legal/Policy Link:** Disaster Management Act, 2005; supports Sendai Framework (2015-2030) & SDG 13 (climate action).
3. **Parameters:** Flood duration, historically flooded area %, deaths, injuries, population.
4. **Data Sources:** India Flood Inventory with Impacts (1967-2023), ILIAS (1981-2021).
5. **Regional Findings:** Indo-Gangetic Plains most vulnerable; top districts Patna, Murshidabad, Thane.
6. **Trends:** Assam has highest flood frequency but lower DFSI due to fewer casualties; fatalities ~1,000 annually nationwide.
7. **Application:** Helps district-level disaster planning, resource allocation, and flood mitigation strategies.

SOURCE – VISION MONTHLY

E-Mobility / India Electric Mobility Index (IEMI)

Recent Context :

NITI Aayog launched the first India Electric Mobility Index (IEMI) and report highlighting EV adoption, charging infrastructure, and R&D, aiming to unlock a \$200 billion opportunity in India.

ABOUT-

1. **Index:** India Electric Mobility Index (IEMI) benchmarks states on EV adoption, charging infrastructure, and EV R&D.
2. **Top States (2024):** Delhi (77), Maharashtra (68), Chandigarh, Karnataka.
3. **EV Types:** Battery EV, Hybrid EV, Plug-in Hybrid EV, Fuel Cell EV.
4. **Challenges:** High capital costs, battery weight, charging infrastructure gaps, low awareness, regulatory & data issues.
5. **Policy Initiatives:** PM E-DRIVE, PLI schemes, PM e-Bus Sewa, GST reduction from 12% → 5%.
6. **Way Forward:** Mandates for ZEV production, strategic charging corridors, battery R&D, unified national EV app, financing mechanisms.
7. **Global Practices:** China's "10 Cities, 1000 Vehicles"; Singapore's EVE; Europe's ChargeMap; UK's APC & UKBIC.



Wise Use of Wetlands – India's Resolution at Ramsar COP15

Recent Context :

India's resolution "Promoting Sustainable Lifestyles for Wetlands" adopted at Ramsar COP15, Zimbabwe, emphasizing Mission LiFE, wetland conservation, citizen engagement, and sustainable ecosystem-based management for biodiversity and climate goals.

ABOUT-

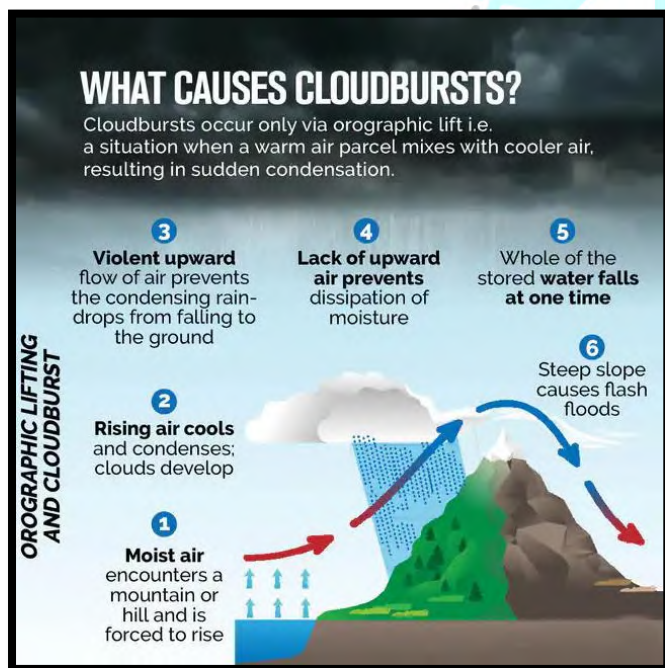
1. **Principle:** "Wise use" under Ramsar Convention – maintain ecological character using ecosystem-based sustainable development.

2. **India's Approach:** National Plan for Conservation of Aquatic Ecosystems (NPCA), Integrated Management Plans (IMPs), 2024 Wetland Wise Use framework.
3. **Citizen Involvement:** Mission Sahbhagita & Save Wetlands campaigns – over 2 million volunteers mapped 170,000+ wetlands.
4. **COP15 Outcomes:** Victoria Falls Declaration; Indo-Burma Ramsar Regional Initiative (IBRRI) 2025–2030.
5. **Funding & Gender:** BRIDGE Programme – gender mainstreaming and women leadership.
6. **SDG Alignment:** Supports biodiversity conservation, climate mitigation, and UN Sustainable Development Goals.

Cloudbursts in Himalayan Regions

Recent Context :

Cloudbursts in Uttarakhand, Himachal Pradesh, and J&K in 2025 caused flash floods and landslides; extreme rainfall events worsened by climate change, deforestation, and unplanned development.



ABOUT-

1. **Definition:** Cloudburst – ≥ 10 cm rainfall in 1 hour at a station (IMD).

2. **Recent Events:** Chamoli (2025, Uttarakhand), Kishtwar (2025, J&K), Himachal Pradesh (2020).
3. **Causes:** Orographic lift, climate change, disrupted precipitation patterns, anthropogenic factors like deforestation and wetland loss.
4. **Impacts:** Flash floods, dam breaks, landslides, biodiversity loss, property & infrastructure damage, casualties.
5. **Structural Measures:** Slope stabilization, bioengineering, stormwater drainage improvement, rivulet/natural water system maintenance.

Global Outlook Council on Water Investments (GOCWI)

Recent Context :

South Africa launched GOCWI under G20 legacy to sustain political and financial momentum for global water security, aligning with GWP's Transformation Agenda to mobilize \$15 billion by 2030.

ABOUT-

1. **Purpose:** High-level platform for global water investment promotion.
2. **Affiliation:** Part of Global Water Partnership (GWP) Transformation Agenda.
3. **Funding Goal:** Mobilize \$15 billion for water security by 2030.
4. **Scope:** Focus on sustainable, equitable, and efficient water management.
5. **G20 Initiative:** Launched as South Africa's G20 Presidential legacy.
6. **Stakeholders:** Multilateral, intergovernmental, private, and civil society engagement.
7. **Significance:** Supports SDG 6 (Clean Water & Sanitation) and climate-resilient infrastructure.

Pollution Control Boards – Environmental Compensation

Recent Context :

Supreme Court ruled PCBs can impose Environmental Compensation under the "Polluter Pays Principle,"

overturning Delhi HC; emphasizes both remedial and compensatory liability for industries causing environmental harm.

ABOUT-

1. **Legal Basis:** Section 33A, Water Act 1974; Section 31A, Air Act 1981.
2. **Polluter Pays Principle:** Liability for restoration and compensation lies with polluting entity.
3. **SC Precedents:** Indian Council for Enviro-Legal Action v. UoI (1986); Vellore Citizens Welfare Forum v. UoI (1996).
4. **Authority:** PCBs empowered to impose penalties and mandate restoration.
5. **Condition:** Penalty only when environmental harm occurs.
6. **Policy Instrument:** Preventive (ex-ante) measures possible by regulators.
7. **Significance:** Strengthens regulatory framework for environmental governance in India.

UNDP Equator Initiative Award – Bibi Fatima SHG

Recent Context :

Bibi Fatima Women's SHG in Dharwad won UNDP Equator Initiative Award for millet-based mixed cropping, climate-resilient farming, horticulture, and livestock practices, promoting biodiversity and sustainable livelihoods.

ABOUT-

1. **Award:** UNDP Equator Initiative, biennial; recognizes local/community biodiversity conservation.
2. **Focus:** Indigenous knowledge, sustainable land use, and livelihood improvement.
3. **Practices:** Millet-based cropping, climate-resilient farming, horticulture, livestock rearing.
4. **Significance:** Known as "Nobel Prize for Biodiversity Conservation."
5. **Geography:** Dharwad, Karnataka.
6. **Impact:** Enhances resilience, food security, and community empowerment.
7. **Global Recognition:** Supports UN Sustainable Development Goals (SDG 2, 12, 15).

Awaza Programme of Action (APoA) 2024–2034

Recent Context :

Third UN Conference on Landlocked Developing Countries (LLDC3) adopted APoA, providing framework for infrastructure, trade, climate resilience, and food security in LLDCs through regional hubs and financing facilities.

ABOUT-

1. **Adoption:** UN General Assembly, December 2024.
2. **Purpose:** Address development challenges of LLDCs.
3. **Key Deliverables:** Regional Agricultural Research Hubs; Infrastructure Investment Finance Facility.
4. **Climate Action:** UNFCCC negotiating body to advance trade and climate resilience.
5. **Timeline:** 2024–2034.
6. **Participants:** LLDCs, international organizations, development partners.
7. **Significance:** Strengthens economic, climate, and food security resilience.

Sundarbans Tiger Reserve Expansion

Recent Context :

Sundarbans Tiger Reserve becomes India's second-largest tiger reserve after NBWL approval, elevating its conservation status; area expansion enhances habitat protection and biodiversity conservation in West Bengal.

ABOUT-

1. **Ranking:** Second-largest tiger reserve in India after Nagarjunasagar-Srisailem.
2. **Approval:** National Board for Wildlife (NBWL).
3. **Legal Provision:** Section 38V, Wildlife Protection Act, 1972.
4. **Alteration:** Requires NTCA recommendation & NBWL approval (Section 38W(1)).
5. **Tiger Reserve Function:** Habitat protection, ecosystem conservation, tiger population management.
6. **Significance:** Supports India's tiger conservation targets under NTCA.

7. **Wildlife:** Protects Sundarbans biodiversity, including Royal Bengal Tiger and Mangrove ecosystems.

Matri Van Initiative, Gurugram

Recent Context :

Gurugram launches 750-acre urban forest under 'Ek Ped Maa Ke Naam', focusing on Aravalli biodiversity restoration, native plantation, and ecological preservation with community participation.

ABOUT-

1. **Location:** Aravalli hills, Gurugram, Haryana.
2. **Area:** 750 acres.
3. **Program:** 'Ek Ped Maa Ke Naam'.
4. **Objective:** Urban forest development & ecological restoration.
5. **Activities:** Remove invasive species, native tree plantation, biodiversity restoration.
6. **Community Role:** Participation in planning and conservation.
7. **Significance:** Urban sustainability, ecological balance, and climate adaptation.



Etalin Hydroelectric Project

Recent Context :

Union Environment Ministry expert panel recommends clearance for Etalin hydroelectric project in Arunachal Pradesh's Dibang valley, impacting Eastern Himalaya biodiversity hotspot with dams on Dri and Tangon rivers.

ABOUT-

1. **Location:** Dibang Valley, Arunachal Pradesh.
2. **Rivers:** Dri and Tangon; join downstream to form Dibang River.
3. **Type:** Concrete gravity dams.
4. **Significance:** Hydropower generation and regional energy security.

5. **Environmental Concerns:** Eastern Himalaya Global Biodiversity Hotspot impact.
6. **Regulatory:** Requires environmental clearance from MoEFCC.
7. **Policy Link:** Balances renewable energy goals with biodiversity protection.

SOURCE – DRISHTI MONTHLY

Volcanic Eruptions

Recent Context :

Recent eruptions reported at Mount Lewotobi, Indonesia, and Mount Kilauea, Hawaii; highlights risks from stratovolcano activity in geologically active zones with potential local hazards.

ABOUT-

1. **Mount Lewotobi:** Two adjacent stratovolcanoes, Indonesia.
2. **Mount Kilauea:** Halemaumau Crater, Hawaii Volcanoes National Park.
3. **Type:** Stratovolcanoes.
4. **Hazards:** Lava flows, ash fall, pyroclastic activity.
5. **Geography:** Hawaii – only US state of islands.
6. **Monitoring:** Volcano observatories track eruption activity.
7. **Significance:** Disaster preparedness and risk mitigation in volcanic regions.

WHO–WMO Report: Climate Change and Workplace Heat Stress (2025)

Topic: Global guidance on occupational heat stress under climate change.

Context : WHO–WMO joint report (2025) issues first global guidance in 50+ years, linking **meteorological data with occupational health**. Rising heat events increase worker injuries, deaths, and productivity losses.

ABOUT-

1. **Background:** Builds on COP28 2023 commitments; aligns with UN New Collective Quantified Goal on climate finance.
2. **Global exposure:** 2.4B workers (~70% workforce) exposed to excessive heat.
3. **Health risks:** Heatstroke, dehydration, chronic kidney disease, neurological impairments.

4. **Economic impact:** 2–3% productivity loss per °C above 20°C; \$2.4T annual losses projected by 2030 (ILO).
5. **Vulnerable sectors:** Agriculture, construction, fisheries, mining; outdoor & indoor workplaces.
6. **Historical context:** ILO Conventions (e.g., 155, 1981) addressed occupational heat, but no integrated climate-health guidance since 1970s.
7. **Trigger events:** Thousands of heatstroke deaths in India (2023–24 summers) and economic losses prompted report.

Dibru-Saikhowa National Park (DSNP), Assam

Topic: Ecological changes and invasive species in a floodplain ecosystem.

Context : DSNP faces **habitat degradation** due to invasive weeds, native species shifts, flooding, and climate stress, threatening Bengal florican, Hog deer, feral horses, and pollinators.

ABOUT-

1. **Location & Status:** Tinsukia & Dibrugarh districts, Assam; Wildlife Sanctuary 1986 → National Park 1999; UNESCO Biosphere Reserve.
2. **River systems:** Brahmaputra & Lohit (north), Dibru river inside (south).
3. **Feral horses:** ~200 individuals; unique floodplain ecosystem.
4. **Dolphins:** Prime habitat for Gangetic dolphin (survey 2023–24).
5. **Native species threats:** Elephant grass, Simul tree affected by flooding & sedimentation; phenology disrupted by climate stress.
6. **Invasive species:** Siam weed, Mikania micrantha, Lantana camara, Parthenium hysterophorus; reduce habitat diversity, alter soil, affect grazing, increase fire risk.
7. **Conservation significance:** Part of Eastern Himalaya–Indo-Burma Biodiversity Hotspot.

Palmyra Palm Tree (Odisha & Tamil Nadu)

Topic: Multipurpose tree for lightning mitigation, food, and ecological benefits.

Context : Palmyra (toddy palm) reduces lightning deaths, provides elephant food, prevents soil erosion, supports livelihoods via toddy, neera, jaggery, and traditional literature use.

ABOUT-

1. **Names & Geography:** Toddy palm, tala/tari/taati chettu; native to tropical Africa, naturalized across India; Tamil Nadu State Tree.
2. **Adaptability:** Semi-arid, <750 mm rainfall; drought & salinity tolerant; life span 100 years.
3. **Lightning mitigation:** Tall, sturdy, fan-shaped leaves; deep roots conduct electricity safely; Odisha sees 300+ lightning deaths annually.
4. **Elephant food:** Fruits, sap, shoots during lean seasons; reduces human-elephant conflict.
5. **Soil conservation:** Prevents erosion in coastal/riverine areas prone to cyclones & floods.
6. **Economic use:** Toddy (alcohol), neera, jaggery (karupatti), palm candy; supports Nadar community livelihoods.
7. **Cultural role:** Palm leaves used for ancient manuscripts (Tamil, Sanskrit, Pali, Prakrit).

Air Quality Life Index (AQLI) 2024

Topic: Health impacts of air pollution in India.

Context : EPIC AQLI study shows **India's PM_{2.5} ~8× WHO safe limit**, reducing life expectancy by 3.5 years on average; Indo-Gangetic plain most affected.

ABOUT-

1. **PM_{2.5} levels:** 8× WHO safe limit (5 µg/m³); India's standard 40 µg/m³ exceeded by 46% population.
2. **Life expectancy impact:** Average loss 3.5 years; Delhi up to 8.2 years.
3. **Worst-affected regions:** Delhi, UP, Bihar, Haryana (Indo-Gangetic Plain).
4. **Health risks:** Cardiovascular, respiratory, and mortality impacts.
5. **Data source:** Energy Policy Institute at University of Chicago (EPIC).
6. **Policy relevance:** Supports air quality regulations, SDG3 (Good Health & Wellbeing).

7. **Mitigation need:** Urgent PM2.5 reduction to improve life expectancy.

Biochar-Led Carbon Drawdown for Sustainable Growth

Recent Context :

With India's carbon market launching in 2026, biochar offers a scalable CO₂ removal pathway from agricultural and municipal waste, supporting sustainable growth and India's low-carbon transition.

ABOUT-

1. **Definition:** Biochar is carbon-rich charcoal from pyrolysis of agricultural residue and organic municipal waste.
2. **Potential:** Sequesters carbon in soil for 100–1,000 years; enhances soil organic carbon.
3. **Waste Utilization:** 30–50% of India's 600 MT agricultural residue + 60 MT municipal waste could remove 0.1 Gt CO₂/year.
4. **Applications:** Agriculture (water retention, reduces nitrous oxide), power generation (syngas & bio-oil), construction (concrete), wastewater treatment.
5. **Other CO₂ Removal Tech:** BECCS, Direct Air Capture, CCUS, afforestation, soil carbon sequestration, ocean-based approaches.
6. **Sectoral Emissions:** Power sector ~50%, transport sector ~12% of India's CO₂ emissions.

Slums in Floodplains

Recent Context :

India has the world's largest number of slum clusters in flood-prone areas; 158 million residents face climate-induced hazards, highlighting urgent need for flood-resilient housing and infrastructure.

ABOUT-

1. **Definition:** UN-HABITAT – settlements lacking durable housing, water, sanitation, secure tenure, or sufficient living area.
2. **Flood Exposure:** 40% of Indian slum dwellers in high-risk urban/suburban flood zones (e.g., Ganga delta).

3. **Global Trend:** 33% of informal settlements in low/middle-income countries are flood-exposed.
4. **Causes:** Riverine floods, urban expansion, flash floods, climate change, poor drainage, weak oversight, lack of local strategies.
5. **Management:** NDMP early warning, zoning laws, flood-resilient infrastructure, rainwater management, lake/wetland restoration.
6. **Government Schemes:** PMAY-U, AMRUT, Smart Cities Mission, SBM-U 2.0.
7. **Key States:** Maharashtra, Andhra Pradesh, Uttar Pradesh, West Bengal; major cities: Mumbai, Kolkata, Bengaluru, Chennai.

First Hydrogen-Powered Coach

Recent Context :

Indian Railways successfully tested its first hydrogen-powered coach at ICF Chennai under the "Hydrogen for Heritage" initiative, advancing clean energy mobility and decarbonisation of transport.

ABOUT-

1. **Location:** Integral Coach Factory (ICF), Chennai.
2. **Agency:** Research Designs & Standards Organisation (RDSO).
3. **Fuel:** Hydrogen, zero-emission propulsion technology.
4. **Significance:** Supports India's hydrogen and EV policy goals.
5. **Application:** Heritage trains, passenger mobility, pilot for future hydrogen-powered fleets.
6. **Environmental Benefit:** Reduces CO₂ emissions from rail sector.
7. **Global Context:** Part of global hydrogen mobility transition; complements EV adoption.

Beetle-Fungus Threat to Rubber Trees

Recent Context :

Kerala's rubber plantations face serious threat from ambrosia beetle (*Euplatypus parallelus*) and associated fungi (*Fusarium ambrosia*, *F. solani*),

reducing latex yield, damaging trees, and posing ecosystem risks.

ABOUT-

1. **Pest & Fungi:** Ambrosia beetle vectors *Fusarium ambrosia* and *F. solani*.
2. **Impact:** Blocks water flow, leaf drop, trunk drying, reduced latex, tree mortality.
3. **Species Threatened:** Over 80 broadleaf species including cashew, teak, coconut, coffee.
4. **Human & Animal Health:** Fungi can affect immunocompromised humans and animals.
5. **Mitigation Measures:** Beetle traps, removal of infected parts, antifungal treatments.
6. **Biocontrol:** Use of antagonistic fungi and microbial consortia.
7. **Significance:** Threatens plantation economy and biodiversity in Kerala.

Flood Risk Management – Global Best Practices

Recent Context :

Climate change increases flood risk; nations adopt engineering, nature-based, and tech-driven approaches to mitigate floods, offering lessons for India's 40 million hectares flood-prone areas.

ABOUT-

1. **Tanzania:** Msimbazi Basin project – dredging, drainage, green flood-resilient areas.
2. **Netherlands:** Floating homes with solar panels, heat exchangers; flood-resistant.
3. **Austria:** Vienna flood relief channel – 21 km parallel to Danube, activates as needed.
4. **China:** Sponge cities – permeable surfaces and wetlands absorb rainwater.
5. **Denmark:** Green Climate Screen – channels rainwater to mineral wool behind willow panels.
6. **USA:** Texas – AI and satellite imagery for detailed flood maps and 7-day forecasts.
7. **India:** Floods cause 63% of annual economic losses; flood control is State subject.

First Auction for Green Ammonia by SECI

Recent Context :

SECI conducted India's first green ammonia auction

under the SIGHT Scheme, promoting green hydrogen production as part of the National Green Hydrogen Mission (NGHM) to reduce fossil fuel dependence.

ABOUT-

1. **Scheme:** SIGHT – under National Green Hydrogen Mission.
2. **Objective:** Financial incentives to boost green hydrogen manufacturing.
3. **Implementing Agency:** Solar Energy Corporation of India (SECI) under MNRE.
4. **Usage:** Green ammonia for fertilizers, energy storage, and industrial applications.
5. **Significance:** Reduces CO₂ emissions and supports energy transition.
6. **Policy Link:** Complements India's renewable energy and net-zero targets.
7. **Global Context:** India aligns with global green hydrogen adoption trends.

Elephant Conservation in India

Recent Context :

MoEFCC marked World Elephant Day 2025 focusing on human-elephant conflict, habitat protection, and technological interventions to safeguard India's Asian elephants, which constitute over 60% of global population.

ABOUT-

1. **Species:** Asian elephant – Endangered (IUCN), Schedule I WPC Act, CITES Appendix I.
2. **Population:** India hosts 60%+ of global Asian elephants; 27,669 (2007) → 29,964 (2017).
3. **Initiatives:** Project Elephant, Project RE-HAB, MIKE program, Gaj Yatra/Gaj Shilpi.
4. **Challenges:** Habitat loss, fragmentation, human-elephant conflict, poaching, train collisions, infrastructure threats.
5. **Mitigation:** Chili powder fences, beehives, banana trap crops.
6. **Tech Interventions:** GPS collars for conflict prediction, Intrusion Detection Systems on railways.
7. **Habitat Protection:** Expand corridors, voluntary relocation, strengthen forest staff capacity.

World Lion Day 2025

Recent Context :

Celebrated annually on 10th August, World Lion Day highlights conservation of big cats. Asiatic lions in India have increased from 523 (2015) to 891 (2025) under Project Lion.

ABOUT-

1. **Species:** Asiatic lion – smaller, less prominent mane, longitudinal belly skin fold.
2. **Habitat:** Grasslands, savannas, dense scrub, open woodlands; mainly Gir Forest, Barda, and some zoos.
3. **Population:** 16th Lion Census (2025) – 891 lions.
4. **Conservation Status:** IUCN: Vulnerable; CITES: Appendix I; WPA 1972: Schedule I.
5. **Project Lion (2020):** 10-year initiative by Gujarat Govt under Centrally Sponsored Scheme.
6. **Greater Gir Concept:** Expands lion habitats beyond Gir to Girnar, Pania, Mitiyala Sanctuaries.
7. **Tech Innovations:** GPS/GIS monitoring, automated sensors, infrared and magnetic tracking.

India Achieves 20% Ethanol Blending in Petrol (2025)

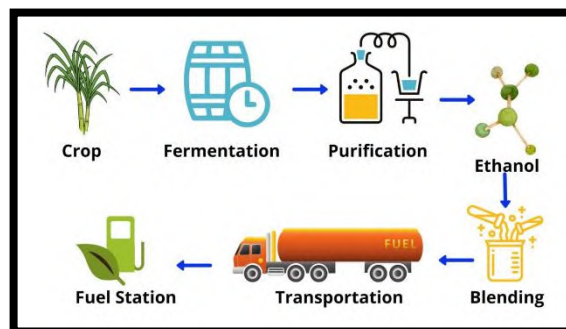
Recent Context :

India reached 20% ethanol blending under Ethanol Blending Programme (EBP), addressing energy security, emission reduction, and rural economy, with challenges in feedstock, water, climate, and industrial pollution.

ABOUT-

1. **Feedstock Concerns:** Promote non-food crops like sorghum; support 3G ethanol from algae (PM JI-VAN).
2. **Water & Pollution:** Mandate effluent treatment, recycled water, and water budgeting for distilleries.
3. **Climate & Land Use:** Encourage drought-resilient, climate-adaptive crops; reduce mono-cropping impact.

4. **Industrial Pollution:** Enforce environmental audits, hearings, and regulate distillery locations.



5. **Infrastructure Gaps:** Pipelines, terminals, and green logistics (National Logistics Policy 2022).
6. **Vehicle Compatibility:** Mandate flex-fuel vehicles, PLI schemes, ETHANOL100 stations, GST reduction.
7. **2G/3G Technology:** Support advanced ethanol tech via R&D and viability gap funding.

Rhisotope Project

Recent Context :

Joint South Africa-IAEA initiative using radioactive isotopes to combat rhino poaching; radioactive markers help trace horn origin and improve anti-poaching enforcement.

ABOUT-

1. **Concept:** Radioisotopes – unstable nuclei emitting α , β , or γ radiation.
2. **Detection:** Geiger counters or photographic film used to detect isotopes.
3. **Applications:** Medicine (I-131 thyroid), archaeology (C-14 dating), industry, power.
4. **Rhisotope Use:** Marks rhino horns for tracing and anti-poaching enforcement.
5. **Goal:** Deter illegal trade by tracking horns back to source.
6. **Global Collaboration:** Partnership between IAEA and South African university.
7. **Significance:** Enhances wildlife crime prevention and strengthens CITES implementation.



Parthenium – Invasive Species Threat

Recent Context :

Parthenium (Congress grass) threatens Pobitora Wildlife Sanctuary (Assam), home to world's densest population of one-horned rhinos, by outcompeting native forage species.

ABOUT-

- Species:** Parthenium hysterophorus – highly invasive alien plant.
- Impact on Wildlife:** Reduces native fodder for rhinos and other herbivores.
- Location:** Assam's Pobitora Wildlife Sanctuary.
- Human Health:** Causes skin allergies, respiratory problems, dermatitis.
- Control Measures:** Biological agents (beetles, insects), manual removal, and herbicides.
- Ecosystem Effect:** Decreases soil fertility, promotes erosion, alters native biodiversity.
- Significance:** Threatens endangered species and ecological balance.

SOURCE – PIB

Topic 5: India's Groundwater Contamination Crisis

Recent Context :

CGWB 2024, report reveals contamination affects 600+ million Indians; caused by industrial pollution, fertilizers, sanitation, natural toxins, and weak regulatory oversight.

ABOUT-

- Causes:** Industrial discharge, excessive fertilizers, improper sanitation, natural contamination (fluoride, arsenic, uranium).
- Hotspots:** Kanpur, Vapi, Rajasthan, Bihar, West Bengal.
- Health Impacts:** Fluoride – skeletal fluorosis; Arsenic – cancers; Nitrate – “blue baby syndrome”;

heavy metals – neurological issues.

- Regulatory Gaps:** CGWB lacks statutory authority; SPCBs under-resourced.
- Key Bodies:** CGWA (regulator), CGWB (monitoring), CWC (coordination), CPCB (pollution control).
- Mitigation:** National Groundwater Pollution Control Framework, sensor-based monitoring, aquifer mapping, community water purification plants.
- Supportive Programs:** Jal Jeevan Mission, Atal Bhujal Yojana, Paramparagat Krishi Vikas Yojana for organic farming.

Revised Waste-to-Energy (WtE) Guidelines

Context : MNRE WtE guidelines simplify compliance, tie **CFA disbursal** to plant performance, encourage MSMEs, decentralized biogas, supporting India's **net-zero 2070 goal**.

ABOUT-

- Performance-based CFA:** 50% after consent to operate, 50% after 80% rated capacity.
- Streamlined inspections:** Joint inspections with NIBE & SNAs; single inspection for no-advance CFA.
- Compliance window:** 18 months from commissioning.
- Sectoral impact:** MSMEs, urban/rural waste generators, energy ecosystem.
- Technology:** Biogas, CBG, power generation from waste.
- Significance:** Encourages investment, reduces delays, supports circular economy.
- Environmental goal:** Waste management, stubble & industrial waste utilization.

Model Rules for Felling Trees in Agricultural Lands

Topic: Agroforestry & timber harvesting reforms.

Context : MoEFCC notified **digital, farmer-friendly rules** for felling trees on private lands, enhancing incomes, carbon sequestration, and timber traceability via NTMS portal.

ABOUT-

1. **Digital registration:** NTMS portal for plantation/felling requests.
2. **Simplified process:** ≤10 trees auto NOC; >10 trees field verification.
3. **Monitoring:** GPS, Google Earth, geospatial tools for growth/yield verification.
4. **State-level committees:** Agriculture, revenue, forestry officials oversee verification.
5. **Ecological benefits:** Carbon sequestration, soil & water conservation.
6. **Economic benefits:** Farmer incomes, reduced timber imports, market linkages.
7. **Challenges:** Digital literacy gaps, NTMS portal delays, state adoption variability, risk of exploitation.

India's Resolution on the Wise Use of Wetlands – Ramsar COP15

Recent Context :

At Ramsar COP15 (Victoria Falls, Zimbabwe), India's resolution on "Promoting Sustainable Lifestyles for the Wise Use of Wetlands" was adopted, linking conservation with the Mission LiFE initiative.

ABOUT-

1. **Objective:** Promote whole-of-society approach for wetlands conservation via sustainable lifestyle interventions.
2. **Alignment:** Builds on UNEA Resolution 6/8 (2024) and COP14 Resolution XIV.8 (CEPA approach).
3. **Global Frameworks:** Integrates 10-Year Framework on Sustainable Consumption and Production (10YFP, Rio+20).
4. **Mission LiFE Linkage:** Encourages conscious consumption, waste reduction, and lower environmental degradation.
5. **Ramsar Definition:** Wise use = maintaining ecological character through ecosystem approaches in sustainable development.
6. **Key Outcomes:** Victoria Falls Declaration – political commitment, resource mobilization, investment in wetland management.
7. **Resolutions & Strategic Plan:** 13 resolutions adopted, 5th Ramsar Strategic Plan with 4 goals, 18 targets, monitored by STRP.

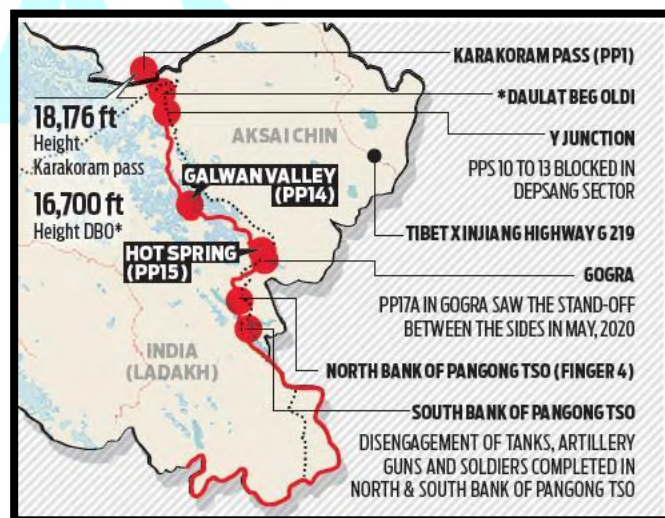
Hot Springs & Origin of Life – Puga Valley, Ladakh

Recent Context :

Travertine deposits in Puga Valley hot springs preserve organic molecules, supporting theories that life could originate in geothermal environments; useful for ISRO's astrobiology missions.

ABOUT-

1. **Location:** Puga Valley, Ladakh.
2. **Discovery:** Travertine (calcium carbonate) deposits trap amino acids, fatty acids, formamide.
3. **Significance:** Challenges silica-based origin theories; calcium carbonate preserves biosignatures.
4. **Techniques Used:** GC-MS-MS, Raman, XRD, IR, stable isotope geochemistry, microscopy.
5. **Implication:** Guides biosignature detection on Mars-like terrains.
6. **Hot Spring vs Geyser:** Hot springs – continuous flow; geysers – intermittent eruptions (Old Faithful, USA).
7. **Health Benefit:** Hot springs often used for bathing and therapeutic purposes.



Marine Heatwaves (MHWs)

Recent Context :

In 2023, 96% of oceans experienced marine heatwaves, raising fears of long-term ocean temperature shifts affecting climate, ecosystems, and global fisheries.

ABOUT-

1. **Definition:** MHW = sea surface temperature ≥3–4°C above average for ≥5 days.

2. **Climatic Impact:** Fuels extreme weather events – storms, floods, droughts, wildfires.
3. **Economic Impact:** Disrupts fisheries, aquaculture; species migration affects livelihoods (e.g., lobster, snow crab).
4. **Ecological Consequences:** Mass invertebrate mortality, invasive species spread, food web disruption.
5. **Causes:** Global warming, El Niño/PDO, reduced cloud cover, changing ocean currents, human-induced feedbacks.
6. **Mitigation:** Reduce GHGs, protect coral reefs/mangroves/seagrasses, artificial upwelling, sustainable fisheries.
7. **Global Cooperation:** Paris Agreement, climate finance, UNCLOS, UN Decade of Ocean Science.

Central Empowered Committee Report on CAMPA

Recent Context :

CEC report assesses compensatory afforestation; 85% targets met, only 67.5% of CAMPA funds utilized, highlighting need for better planning, fund utilization, and ecological restoration.

ABOUT-

1. **CAMPA:** Statutory body under CAF Act, 2016; manages afforestation funds when forest land diverted.
2. **Background:** SC-mandated post T.N. Godavarman (1995); monitors compensatory afforestation under Forest (Conservation) Act, 1980.
3. **Fund Allocation:** 90% to states/UTs, 10% retained by Centre for oversight and capacity building.
4. **Challenges:** Land constraints, underutilization, monoculture plantations, greenwashing, community sidelining.
5. **Legal/Policy Gaps:** Delays, lack of dedicated CAMPA offices, no time-bound targets.
6. **Measures:** Create central degraded land bank, biodiversity-focused community plantations, third-party audits, transparency.
7. **Linkages:** Align afforestation with IPCC, India's NDCs, Paris Agreement goals.

Environment Protection (Management of Contaminated Sites) Rules, 2025

Recent Context :

MoEFCC notified rules under EPA 1986 to manage chemically contaminated sites, ensuring identification, assessment, remediation, and liability under Polluter Pays Principle and Bharatiya Nyaya Sanhita, 2023.

ABOUT-

1. **Definition:** Contaminated sites – historical hazardous waste dumping causing soil, groundwater, surface water contamination (landfills, chemical dumps, spill sites).
2. **Identification:** District authorities report suspected sites; SPCBs conduct preliminary (90 days) and detailed (90 days) assessments.
3. **Declaration:** Sites with 189 hazardous chemicals above safe limits officially listed; names publicised, access restricted.
4. **Remediation:** Site-specific plans by expert bodies; polluters bear costs.
5. **Liability:** Polluter Pays Principle; untraceable polluters' costs shared Centre-States; criminal liability under BNS 2023.
6. **Exclusions:** Radioactive waste, mining, marine oil spills, solid waste dumps (covered under separate laws).
7. **Legal Basis:** Environment Protection Act, 1986; supports Article 48A, Article 51A; aligns with Stockholm Conference, 1972.

SOURCE – INSIGHTS MONTHLY

Global Plastic Pollution

Recent Context :

INC-5.2 negotiations on the Global Plastics Treaty in Geneva (Aug 2025) ended in deadlock over production caps, CBDR, private sector obligations, and North-South equity in tackling plastic pollution.

ABOUT-

1. **Global Plastics Treaty:** Legally binding international agreement under UNEP to tackle plastic pollution across lifecycle (production → disposal).
2. **Points of Contention:** Production caps vs waste management, CBDR, voluntary vs

binding corporate commitments, division among oil-producing and SIDS countries.

3. **India's Position:** Advocates equity and CBDR, opposes blanket production caps, favors phased reduction of single-use plastics.
4. **Environmental Impact:** Threatens >800 species, microplastics reduce soil fertility, climate impact via GHG emissions from production/incineration.
5. **Human Health Impact:** Chemicals like BPA/phthalates cause hormonal disruption, cancer; microplastics detected in blood, placenta, lungs.
6. **Economic Impact:** Marine economy losses, increased waste management costs, loss of recyclable materials.
7. **India Initiatives:** PWM Rules 2009–2016 (EPR), SUP ban (2022), Mission LIFE campaigns, national reporting portal (2025), integrating informal sector, 3Rs (Reduce, Reuse, Recycle).

Privileges and Immunities to IBCA

Context :

India granted privileges and immunities to International Big Cat Alliance (IBCA) under UN Act, 1947, strengthening global cooperation for conservation of seven big cats with headquarters in India.

ABOUT-

1. **IBCA** launched **April 2023**; **treaty-based intergovernmental organization** for **big cat conservation**.
2. **Membership:** **95 range & non-range countries, NGOs, corporates, scientific partners**.
3. **Coverage:** **tiger, lion, leopard, snow leopard, cheetah, jaguar, puma**.
4. **Host country:** **India**; privileges under **UN Privileges and Immunities Act, 1947**.
5. **First assembly:** **June 2025, New Delhi**, chaired by **Union Environment Minister**.
6. **Privileges:** **immunity from taxation, legal proceedings, regulations**.

7. **Significance:** boosts **India's wildlife diplomacy** and **capacity-building initiatives**.

National Designated Authority (NDA) for Carbon Markets

Context :

MoEFCC established National Designated Authority (NDA) on 22 Aug 2025 to operationalize Article 6 of Paris Agreement, enabling international carbon trading aligned with India's NDC targets.

Prelims Points:

- **Article 6** enables **carbon trading**; one **credit** = **1 tonne CO₂** equivalent reduction.
- **NDA** chaired by **MoEFCC Secretary**; **21-member committee** includes **MEA, NITI Aayog, Ministry of Steel**.
- **Functions:** **project approval**, **ERU issuance**, alignment with **SDGs** and **NDCs**.
- Monitors and recommends **emission reduction activities** for **international cooperation**.
- **Carbon credits** help meet **India's NDC: 45% GDP emission reduction, 50% non-fossil power, 2.5–3 Bt CO₂ sink**.
- Updates **eligibility norms** as per **national priorities**.
- Supports **carbon market transparency** and **integrity** per **COP29, Baku (2024)**.

ICRISAT AI-Driven Climate Advisory for Farmers

Context :

ICRISAT launched AI-powered advisory under Monsoon Mission III to support smallholders with real-time hyper-local climate and crop guidance, improving climate-resilient agriculture in semi-arid regions of India.

Prelims Points:

1. **Project:** **AI-powered, Context-Specific Agromet Advisory Services, Climate-Resilient Agriculture**.
2. **Core platform:** **iSAT (Intelligent Systems Advisory Tool)**, integrates **weather data, crop models, ML analytics**.
3. **Delivery:** **WhatsApp bot, digital tools, remote farmers**.

4. **Hyper-local advisories** on sowing, irrigation, pest/disease management.
5. **Pilot phase: Maharashtra**, via ICAR Agro-Meteorological Field Units (AMFUs).
6. Supports **smallholder farmers**; **scalable model**, **Global South**.
7. Established by **ICRISAT (1972, Hyderabad)**, in collaboration with ICAR.

Global Gas Flaring Tracker Report

Context :

The 2025 World Bank report highlights a rise in CO₂e emissions from gas flaring, with 389 MtCO₂e in 2024, tracking progress toward zero routine flaring by 2030.

Prelims Points:

1. **Gas flaring** – burning **natural gas** during **oil extraction**; types: **routine, emergency, unplanned**.
2. **Flare gas composition**: **methane, ethane, propane, butane, CO₂, H₂S, VOCs, nitrogen, water vapour**.
3. **Unburnt methane**: **46 MtCO₂e**; **GWP 84–87× CO₂** over 20 years.
4. **Top flaring nations**: **Russia, Iran, Iraq, US, Venezuela, Algeria, Libya, Mexico, Nigeria (76% global flaring)**.
5. **Nigeria flaring** ↑12% despite **3% oil output** rise.
6. **Environmental impact**: **GHG emissions, black carbon, wasted energy resources**.
7. **Zero Routine Flaring by 2030** (World Bank initiative).

Sustainable Aviation Fuel (SAF)

Context :

IOC plans commercial SAF production by December 2025, targeting 35,000 tonnes annually, supporting India's 1% SAF blending goal for international flights by 2027 and decarbonising aviation.

Prelims Points:

1. **SAF** – **aviation biofuel** from **renewable feedstocks**; **chemically similar to jet fuel**; **drop-in fuel**, compatible with **existing aircraft**.

2. **Feedstocks**: **oils/fats** (used cooking oil, algae), **waste** (MSW, agricultural residues), **sugars/starches** (sugarcane, maize).
3. **Emission reduction**: up to **80% lower GHGs** than **conventional ATF**.
4. **Energy security**: reduces **oil import dependence**, mitigates **price shocks**.
5. **Sustainability**: **non-food feedstocks**, avoids **deforestation**.
6. **Annual IOC production**: **35,000 tonnes**; supports India's **1% SAF blending target by 2027**.
7. **Decarbonisation**: **SAF** expected to achieve **>60% global aviation emission cuts**.

Ramsar CoP15 – India's Resolution

Context :

India's resolution on 'Promoting Sustainable Lifestyles for Wise Use of Wetlands' adopted at Ramsar CoP15, emphasizing a whole-of-society approach and sustainable living for wetland conservation.

Prelims Points:

1. **Whole-of-Society approach** – **government, private sector, civil society, academia, media, individuals**.
2. **Sustainable lifestyles** – **minimize environmental degradation**, **conserve resources**, **reduce waste**, **equitable socio-economic development**.
3. Builds on **UN Environment Assembly Resolution 6/8 (2024)** on **sustainable lifestyles**.
4. Reinforces **Mission LiFE**, launched at **COP26** by **PM Modi**.
5. **Ramsar Convention (1971)** – **wetland conservation**; India joined **1982**; **91 sites**.
6. **Wetlands** – **flooded ecosystems**, crucial for **biodiversity, water regulation, carbon storage**.
7. Resolution supported by **172 Contracting Parties** and **six international organization partners**.

Grassland Invaders – Dibru-Saikhowa National Park (DSNP)

Context :

Study shows native and invasive species altering grasslands in Assam's DSNP, causing biodiversity loss, carbon storage reduction, and land use changes due to floods and anthropogenic pressures.

Prelims Points:

1. **Native invaders – Bombax ceiba (Simalu), Lagerstroemia speciosa (Ajar).**
2. **Invasive species – Chromolaena odorata, Ageratum conyzoides, Parthenium hysterophorus, Mikania micrantha.**
3. **Grassland decline – from 28.78% (2000), replaced by shrubland, degraded forests.**
4. **DSNP – Eastern Assam, area 765 sq km; core 340 sq km, buffer 425 sq km.**
5. **UNESCO Biosphere Reserve (1997), National Park (1999); only feral horse habitat in India (~200).**
6. **Fauna – white-winged wood duck, water buffalo, tiger, capped langur.**
7. **Climate – moist mixed semi-evergreen/deciduous forests, canebrakes, grasslands, largest Salix swamp forest.**

IUCN–TRAFFIC Report 2025

Context :

The 2025 IUCN–TRAFFIC report credits India and Nepal for improved monitoring, surveillance, and conservation of rhinos, reducing poaching and supporting population recovery of African and Asian species.

Prelims Points:

1. **TRAFFIC – NGO, ensures trade in wild flora/fauna does not threaten biodiversity; est. 1976 (WWF + IUCN).**
2. **Commissioned by CITES; reports on African & Asian rhinos.**
3. **Greater One-Horned Rhino – India, Nepal; Vulnerable; grasslands, riverine forests.**
4. **Javan & Sumatran Rhinos – Critically Endangered; Indonesia.**
5. **White Rhino – Southern Africa; Near Threatened.**

6. **Black Rhino – Eastern & Southern Africa; Critically Endangered.**
7. **Focus – monitoring, anti-poaching, population growth, trade regulation.**

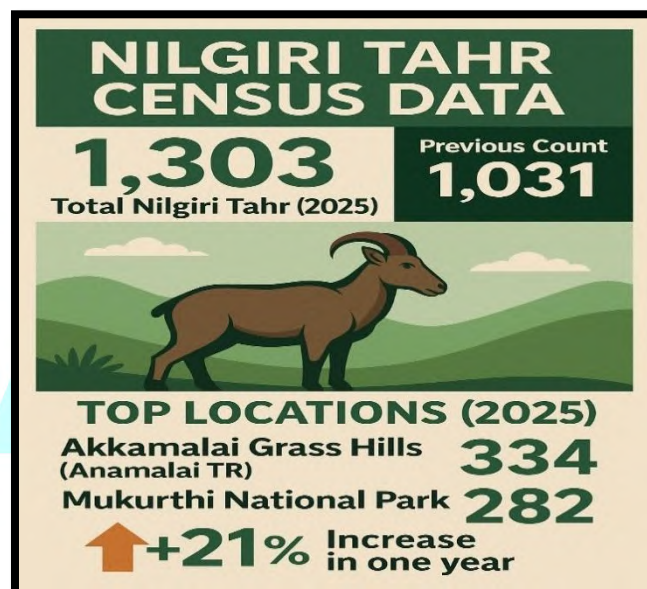
Sundarbans Tiger Reserve Expansion

Context :

Sundarbans Tiger Reserve in West Bengal expanded by 1,044.68 sq km, becoming India's second-largest TR (3,629.57 sq km), supporting mangrove ecosystems and tiger conservation.

Prelims Points:

1. **Location – South & North 24-Parganas, West Bengal; Lower Gangetic Delta.**
2. **Tiger Reserve, National Park, Biosphere**



Reserve, UNESCO World Heritage, Ramsar site.

3. **Added ranges – Matla, Raidighi, Ramganga.**
4. **Landscape – estuaries, river channels, 105 islands; mangrove forest supports ~101 tigers (2022).**
5. **Flora – true mangroves, mangrove associates, halophytic herbs/shrubs, epiphytes, parasitic plants.**
6. **Fauna – Royal Bengal tiger, fishing cat, estuarine & Irrawaddy dolphins, king cobra, migratory birds.**
7. **Significance – biodiversity hotspot, coastal protection, climate resilience.**

Starfish – Sea Star Wasting Disease (SSWD)

Context :

Scientists identify **Vibrio pectenica** bacteria as the cause of **SSWD**, which has killed over **5 billion starfish** since 2013 along **North America's Pacific coast**.

Prelims Points:

1. **SSWD**: lesions, limb loss, tissue decay, eventual death of starfish.
2. **Cause**: **Vibrio pectenica** bacteria; overturns previous **viral hypothesis**.
3. **Sunflower starfish (Pycnopodia helianthoides)**: largest, fastest sea star; up to 1 m diameter, 24 arms.
4. **Habitat**: **Pacific Ocean** (Alaska to Baja California); intertidal to 435 m, mostly <120 m.
5. **Ecological role**: **Top predator of sea urchins**; maintains kelp forest health.
6. **Conservation Status**: **Critically Endangered (IUCN)**.
7. **Impact**: Decline leads to **urchin population boom**, kelp forest degradation.

Palamau Tiger Reserve

Context :

Palamau Tiger Reserve reports a steep decline in **Gaur population** from 150 (1970s) to 68, despite **India** hosting **85%** of the global population, highlighting **habitat and disease pressures**.

Prelims Points:

1. Largest living **wild cattle**; also called **Indian Bison**.
2. **Habitat**: **Evergreen and moist deciduous forests**; native to South/Southeast Asia.
3. **Global population**: 13,000–30,000; **India** hosts ~85%.
4. **Population in Nilgiris**: ~2,000 (2020 estimate).
5. **Threats**: **Habitat loss, poaching, diseases** from domestic cattle.
6. **Conservation Status**: **IUCN – Vulnerable; WPA 1972 – Schedule I; CITES – Appendix I**.
7. **Color**: **Dark brown/black**; females lighter.

Asian Palm Civet (*Paradoxurus hermaphroditus*)

Context :

Rising **human–civet encounters** in **Kerala** highlight

ecological, cultural, and legal challenges, as the **nocturnal omnivore** increasingly ventures into **urban and semi-urban areas**.

Prelims Points:

1. Small **nocturnal mammal**; slender body, pointed snout, **white facial mask**; also called **Toddy Cat**.
2. **Habitat**: **South and Southeast Asia; India**.
3. **Diet**: **Omnivorous**—fruits, insects, small animals; **seed dispersal agent**.
4. **Unique trait**: Produces **Kopi Luwak coffee** from digested beans.
5. **Conservation Status**: **Least Concern (IUCN); Schedule II WPA 1972**.
6. **Ecological significance**: **Forest regeneration, pest control**.
7. **Cultural importance**: Linked to **toddy tapping** in Kerala.

Arctic Reindeer (*Rangifer tarandus*)

Context :

2025 study warns **Arctic reindeer** populations could decline by up to 80% by 2100 due to **climate change**, threatening **Arctic ecosystems** and food security for indigenous communities.

Prelims Points:

1. Large **herbivorous mammals**, adapted to **cold environments**.
2. **Unique feature**: Antlers up to 44 points, 1.4 m long; **females also have antlers**.
3. **Habitat**: **Tundra and boreal forests** across North America, Europe, Eurasia.
4. **Ecological importance**: Controls **plant diversity, nutrient cycles**.
5. **Threats**: **Climate change**—food scarcity, snow cover loss, migration disruption.
6. Human threats: **Oil exploration, mining, infrastructure** fragment habitats.
7. **Conservation Status**: **IUCN – Vulnerable**.

Krill

Context :

Krill, key to marine food chains, face **pressure** from **fishing, climate change, and demand** for omega-3 oil used in **fishmeal, pet food, and human supplements**.

7. **Significance:** Supports **district-level disaster planning** and **mitigation strategies**.

Haryana's 'Dictionary Meaning of Forest'

Topic: Legal definition of **forest** in Haryana after **Supreme Court directive**.

Context : Following **SC directives (March 2025)** on **FCA 2023 challenge**, Haryana defined forests using **dictionary meaning**, including **recorded/unrecorded forests**, ≥ 5 ha, canopy $\geq 40\%$, and predominantly **tree-covered land**.

ABOUT-

1. **Minimum area:** 5 ha (isolated), 2 ha (contiguous to forests).
2. **Canopy density:** $\geq 40\%$.
3. **Vegetation:** Predominantly **trees**; excludes **linear plantations, orchards outside notified forests**.
4. **Legal basis:** **Forest Conservation Act 1980**, **Indian Forest Act 1927**, **Godavarman case (1996)**.
5. **SC directive:** States/UTs must **map all forest lands**, including **unclassified/community forests**.
6. **Accountability:** **Chief Secretaries/UT Administrators** held personally responsible for non-compliance.
7. **Significance:** Prevents **deforestation**, ensures broad protection under **FCA**, and reconciles **dictionary vs. recorded definition**.

India's EPR Framework for Non-Ferrous Metals

Topic: Extended Producer Responsibility (EPR) rules for recycling.

Context : Union government notified EPR rules (2025, effective April 2026) for **aluminum, copper, zinc**, aiming for circular economy, phased **10–75% recycling targets**, CPCB monitoring, but informal sector integration unclear.

ABOUT-

1. **Legislation:** Hazardous and Other Wastes (Management & Transboundary Movement) Amendment Rules, 2025.

2. **Scope:** Beverage cans, packaging foils, electrical fittings, furniture, and other non-ferrous products.
3. **Targets:** 10% (2026–27) $\rightarrow$ 75% (2032–33).
4. **Monitoring:** CPCB to manage centralized online portal, track compliance, trade EPR certificates.
5. **Stakeholders:** Producers, manufacturers, recyclers, refurbishers, collection agents, bulk consumers.
6. **Challenges:** Overburdened CPCB, informal sector exclusion, complex compliance, unclear penalties.
7. **Recommendations:** Capacity building, informal sector integration, clear guidelines on certificates & penalties.

Unlocking Energy Efficiency of ACs & Water Pumps

Topic: Energy efficiency to meet India's **net-zero 2070 target**.

Context : ACs and irrigation pumps drive peak demand; efficiency upgrades can **reduce 60 GW load**, **save ₹9.7T**, supporting climate-resilient agriculture and electricity grid stability.

ABOUT-

1. **ACs growth:** 1 in 10 households; $>1B$ ACs expected by 2050; 130–150M new ACs (2025–2035).
2. **Water pumps:** 32M irrigation pumps; most inefficient; high electricity use.
3. **Potential savings:** AC upgrades reduce 60 GW peak; ₹7.5T avoided grid investments; ₹2.2T consumer savings.
4. **Policy:** Bureau of Energy Efficiency (BEE), MEPS revisions.
5. **Energy demand:** India's energy $\uparrow 63\%$ (2012–2022); peak demand 366.4 GW by 2031–32.
6. **COP28 pledge:** Double energy efficiency rate from 2% $\rightarrow$ 4% by 2030.
7. **Sectoral focus:** ACs & pumps critical despite lighting/refrigerator efficiency gains.

Herbicide-Tolerant (HT) Cotton in India

Topic: Unauthorized HT cotton cultivation in MP.

Context : HT cotton tolerates glyphosate;

unauthorized circulation risks **superweeds**, **biodiversity loss**, **water contamination**, and affects soil health; regulatory oversight and integrated pest management needed for sustainable cotton revival.

ABOUT-

1. **Glyphosate tolerance:** Simplifies weed control, but encourages overuse.
2. **Ecological risks:** Superweeds, aquatic contamination, pollinator loss, soil degradation.
3. **Legal status:** Not approved for commercial cultivation; 75 lakh illegal seed packets sold (2021).
4. **Economic risks:** Pest evolution threatens Bt cotton gains; low yields possible.
5. **Regulators:** GEAC failing to curb unauthorized sales.
6. **Sustainable alternatives:** Pest-resistant hybrids, cropping diversification, ecological farming, integrated pest management.
7. **Human health:** Glyphosate potential carcinogen; caution urged.

UNEP: Frontiers 2025 & Legacy Chemicals

Topic: Floods remobilize toxic legacy chemicals.

Context : UNEP Frontiers 2025 warns intensified floods **redistribute heavy metals & POPs**, impacting ecosystems and humans; nature-based solutions, river basin management, and sediment mapping recommended.

ABOUT-

1. **Legacy chemicals:** Lead, cadmium, pesticides, industrial by-products.
2. **Flood mobilization:** Resuspension of sediments spreads toxins into water & food chains.
3. **Examples:** Hurricane Harvey, Niger Delta floods, Pakistan 2010 floods.
4. **Health risks:** Neurotoxicity, kidney/bone damage, endocrine disruption, cancers.
5. **India examples:** Ganga, Hindon, Vaigai sediments exceed safe cadmium levels.
6. **Climate impact:** Heavy rainfall, storms increase flood toxicity risk.

7. **Mitigation:** Wetlands, polders, retention basins, sediment pollution mapping.

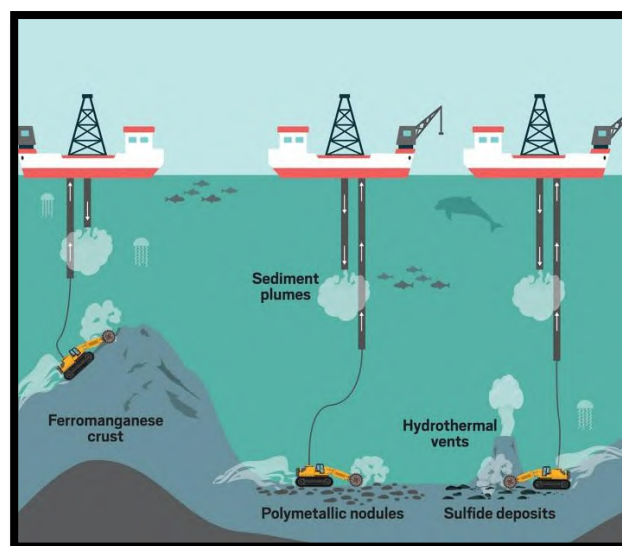
Offshore Sand Mining in India

Topic: Marine mineral extraction and environmental concerns.

Context : Government auctions offshore sand deposits in Kerala, Gujarat, Andaman; concerns over **marine ecosystem disruption, turbidity, pollution, coastal erosion, and fisher livelihoods**; managed under **OAMDR Act 2002**.

ABOUT-

1. **Depth & deposits:** 22–45 m; Kerala offshore 745M tonnes, Kollam 302M tonnes.
2. **Legal framework:** MMDR Act 1957 (minor minerals), Offshore Areas Mineral Act 2002 (private leases, 50 years).
3. **Economic rationale:** Meets 25-year construction demand; revenue via trade, GST.
4. **Ecological risks:** Fish breeding, benthic habitats, water quality, shoreline erosion.
5. **Social impact:** 25,000+ fishers dependent on Kollam Bank affected.
6. **Regulatory safeguards:** Environmental management plans, coordination with scientific institutions.
7. **Sustainability concern:** Need balance between extraction & ecological preservation.

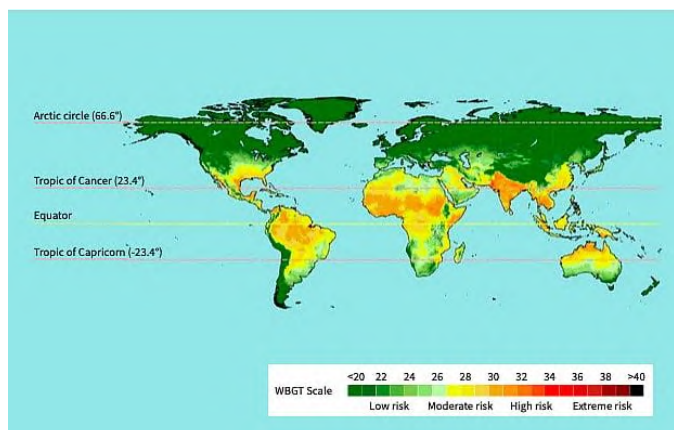


ENVIRONMENT

SOURCE: DOWN TO EARTH

GLOBAL WORKER PRODUCTIVITY & HEAT STRESS

RECENT UPDATE: Rising **heat stress** is reducing **worker output** and threatening **global livelihoods**, warns **WMO–WHO report**.



ABOUT:

1. **2024 hottest year** at **1.45°C** above pre-industrial average.
2. Each degree above **20°C WBGT** reduces output **2–3%**.
3. **2.4 billion workers** exposed to unsafe heat levels.
4. Causes **22.85 million injuries** and **19,000 deaths** annually.
5. **Agriculture and construction** most affected.
6. Safe body temperature capped at **38°C** for 8-hour workdays.
7. Urges **national heat-health plans** and **cooling innovations**.

EXTREMELY HEAVY RAINS IN NORTH INDIA

RECENT UPDATE:

According to the **India Meteorological Department (IMD)**, rainfall across **Punjab, Himachal Pradesh, and Jammu & Kashmir** in 2025 has crossed the '**extremely heavy**' **threshold**, marking one of the most intense monsoon phases in decades.

ABOUT:

1. **Punjab** saw **24 of 31 days** of heavy to extremely heavy rainfall in August, exceeding **204 mm/day** on several occasions.
2. **Himachal Pradesh** experienced record-breaking rainfall for **over 90% of the past three months**, while **Jammu & Kashmir** also saw relentless downpours.
3. Between **June and August**, rainfall was nearly **50% above normal**, sometimes surging **300–400% weekly** above averages.
4. **IMD's classification** defines rainfall above **204.4 mm in 24 hours** as **Extremely Heavy Rain**.
5. **Climate change** has intensified rainfall, compressing entire **seasonal rainfalls into a few hours or days**.
6. **Western disturbances**, which usually weaken during monsoon, surged to **19 occurrences**, amplifying the monsoon effect.
7. Warming oceans and **disrupted wind patterns** from the **Arabian Sea and Arctic** have created unstable, moisture-rich conditions.

DEVELOPMENT AND RECKLESSNESS

RECENT UPDATE:

Experts warn that **human-driven ecological damage** is worsening the impact of natural rainfall extremes in Himalayan and northern states.

ABOUT:

1. **Construction in floodplains** and **poor drainage planning** have intensified flood severity.
2. **Encroachment on fragile slopes** makes landslides more frequent and deadly.
3. Rapid expansion of **roads, hydropower, and housing** ignores seismic and hydrological risks.
4. The **Himalayas**, being a **young and unstable mountain range**, are highly sensitive to such interventions.

- 5. Deforestation has reduced **water absorption capacity**, increasing surface runoff.
- 6. Experts call for **climate-sensitive infrastructure** and **enforcement of ecological zoning laws**.
- 7. Long-term planning must prioritize **resilience, early warning systems, and natural water storage restoration**.

PUNJAB FLOOD 2025

RECENT UPDATE:

Punjab has suffered its **worst floods since 1988**, with **rivers overflowing, back-to-back rain spells**, and **massive crop losses** across the state.



ABOUT:

- 1. The **2025 floods** follow decades of recurring disasters — major ones occurred in **1955, 1988, 2008, 2019, and 2023**.
- 2. Punjab faced a **54% seasonal rainfall surplus**, and between late August weeks, surpluses hit **388–454%**.
- 3. Floods **submerged 1.39 million hectares of crops**, affected **1,247 villages**, and caused **48 deaths**.
- 4. **Himachal Pradesh** saw **three extreme rain spells**, with over **400% surplus** in some districts.
- 5. **Jammu & Kashmir** witnessed rainfall surpluses of **260% and 241%** in consecutive weeks, swelling rivers like **Ravi**.
- 6. **Ladakh** recorded **434% surplus rainfall**, heightening fears of **glacial lake outburst floods**.

- 7. The flooding resulted from **combined hydrological stress** across Himalayan catchments, not just local rains.

A NATIONWIDE CRISIS

RECENT UPDATE:

India recorded **extreme weather on all 92 days** from June to August 2025, signaling an unprecedented nationwide climate disruption.

ABOUT:

- 1. **One-third of Indian districts** received **excess or large excess rainfall** during this period.
- 2. **13 states and UTs** faced **extreme weather events every alternate day**.
- 3. **Himachal Pradesh** was hit on **76 of 92 days**, while **Jharkhand** reported **470 lightning deaths**.
- 4. By August 2025, **3,502 deaths** were recorded nationwide — **40% higher than 2024**.
- 5. **Western disturbances (19 occurrences)** and **anomalous Arabian Sea winds** were key drivers.
- 6. **Potential Vorticity Cut-Off Lows** — cold systems from the Arctic jet stream — worsened rainfall concentration.
- 7. **Global linkages** like Arctic warming and Indian Ocean instability have magnified rainfall unpredictability.

RETHINKING WILDLIFE CONSERVATION IN INDIA:
BALANCING PEOPLE AND NATURE

RECENT UPDATE: Experts call for reforms in India’s **Wildlife Protection Act**, citing **rising human–animal conflict**.

ABOUT:

- 1. The **1972 Act** once permitted controlled hunting; later bans made even deterrence illegal.
- 2. **1,510 deaths in 2022** linked to wildlife attacks.
- 3. **Crop and property losses** cross **₹2 lakh crore annually**.

4. Raises a conflict between **Article 21 (right to life)** and animal protection.
5. Advocates **zoning protected areas** to contain dangerous species.
6. Promotes **community-led conservation** and **eco-tourism livelihoods**.
7. Urges a **rights-balanced law** blending coexistence with safety.

VULTURES VS DOGS FALLOUT

RECENT UPDATE: India's **98% vulture decline** has spurred **stray dog overpopulation** and **disease spread**.

ABOUT:

1. Vultures once **cleared carcasses**, preventing outbreaks.
2. Dog numbers surged, spreading **rabies and distemper**.
3. Dogs now **threaten wildlife** by predation.
4. **Captive breeding and feeding zones** support recovery.
5. **Sterilisation drives** help check dog populations.
6. India's key species are **Critically Endangered**.
7. Measures like **diclofenac ban** and **vulture restaurants** aid revival.

SNOW LEOPARDS



RECENT UPDATE: Camera traps in Jammu & Kashmir confirm **year-round breeding** of snow leopards.

ABOUT:

1. Found across **12 Asian countries**, preferring **high-altitude terrain**.
2. India's **SPAI survey** counted **718 individuals**.
3. Only **34% of habitat** protected.
4. **IUCN: Vulnerable**, **Schedule I** under Wildlife Act.
5. **Project Snow Leopard (2009)** promotes landscape-level protection.
6. Plans for a **Snow Leopard Cell** at **WII** underway.
7. **GSLEP initiative** enables **transboundary cooperation**.

SUNDARBANS TIGER RESERVE IN WEST BENGAL

RECENT UPDATE: Sundarbans Tiger Reserve expanded by **1,044.68 sq km**, now India's **second-largest**.



ABOUT:

1. Established **1973**, part of **world's largest mangrove ecosystem**.
2. Home to **Royal Bengal Tiger** and **Gangetic Dolphin**.
3. **UNESCO World Heritage (1985)**, **Biosphere Reserve (1989)**.
4. Expansion strengthens **tiger corridors** and biodiversity.
5. Governed by **NBWL**, chaired by the **Prime Minister**.
6. NBWL oversees **forest diversion and conservation projects**.
7. Supports **Project Tiger** and **Project Snow Leopard synergy**.

VERVET MONKEYS



RECENT UPDATE: Growing use of **vervet monkeys in biomedical research** has sparked conservation concerns.

ABOUT:

1. Belong to genus **Chlorocebus**, widespread across **sub-Saharan Africa**.
2. Introduced to **Caribbean islands** in the 17th century.
3. Adapt to **savannas and open woodlands**.
4. Display **complex alarm calls** for predators.
5. Common in **neuroscience research**.
6. **IUCN Status: Least Concern**.
7. Emphasis on **ethical research and habitat preservation**.

SOURCE: VISION MONTHLY

UN 'HIGH SEAS' TREATY

Recent Update: The **Treaty for the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction (BBNJ)** is set to enter into force after its **60th ratification**.

About:

1. Aims to ensure **conservation and sustainable use** of marine biodiversity beyond national jurisdictions.
2. Implemented under the **UN Convention on the Law of the Sea (UNCLOS)**.

3. Third implementing agreement under UNCLOS after **1994 Part XI** and **1995 UN Fish Stocks Agreement**.
4. Establishes **funding mechanism, COP, Clearing-House Mechanism, and Secretariat**.
5. Enters into force **120 days after 60 ratifications** (74 ratified as of Sept 2025).
6. **India signed** but not yet ratified.
7. **Non-UNCLOS members** can also join.

SUSTAINABLE DEVELOPMENT: HARMONIZING GROWTH WITH PEOPLE'S NEEDS

Recent Update: **Uttarakhand Govt** approved the **Netala bypass in Bhagirathi Eco-Sensitive Zone** despite ecological concerns.

About:

1. Highlights conflict between **national security projects** and **ecological sustainability**.
2. Project in **fragile Himalayan ecosystem** prone to **landslides and slope instability**.
3. Raises concerns on **balancing strategic needs** with **local livelihood** protection.
4. **Eco-Sensitive Zones (ESZ)** notified under **Environment (Protection) Act, 1986**.
5. ESZ activities classified as **Prohibited, Regulated, and Permitted**.
6. Aim: Serve as a **buffer around protected areas** for ecological safety.

PUBLIC CONSULTATION AND ENVIRONMENT IMPACT ASSESSMENT (EIA)

Recent Update: **MoEFCC** exempted **mining of atomic, critical, and strategic minerals** from **public consultation** under **EIA 2006**.

About:

1. Applies to minerals like **uranium, lithium, and rare earth elements**.
2. Projects still undergo **central appraisal** despite consultation exemption.
3. **Public consultation** gathers views of **affected stakeholders**.
4. Required for **Category A and B1** projects.

5. Conducted by **State Pollution Control Boards (SPCBs)** within **45 days**.
6. Two components: **Public hearing** and **written stakeholder responses**.

ENVIRONMENT AUDIT RULES, 2025

Recent Update: MoEFCC notified the **Environment Audit Rules, 2025**.

About:

1. **Systematic audit** assessing compliance with **Environmental Management Plan (EMP)**.
2. Differs from **EIA** — conducted **after project implementation**.
3. Introduced via **Rule 14 of Environment (Protection) Rules, 1992**.
4. **Annual environment statements** mandatory for industries under **Water, Air, and Hazardous Waste Acts**.
5. Reports submitted annually to **SPCBs** for compliance verification.

VAN (SANRAKSHAN EVAM SAMVARDHAN) AMENDMENT RULES, 2025

Recent Update: MoEFCC amended the **Van Rules, 2023**, introducing key forest land diversion changes.

About:

1. Issued under **Forest (Conservation) Act, 1980**.
2. **Compensatory Afforestation (CA)** land transfer now flexible — may go to **Forest Dept** or be protected under other laws.
3. **Mining of critical/strategic minerals** requires CA on **degraded land** double the diverted area.
4. States allowed to grant '**working permission**' for **linear projects** (roads, railways, power lines).
5. Streamlines **project approvals** while ensuring **afforestation compliance**.

GREEN CREDIT PROGRAM

Recent Update: MoEFCC issued a new methodology for calculating **Green Credit** under **Green Credit Rules, 2023**.

About:

1. Introduced under **Environment (Protection) Act, 1986**.
2. **Market-based mechanism** encouraging **voluntary afforestation** and **conservation**.
3. Linked to **Mission LiFE** promoting sustainable lifestyles.
4. Administered by **Indian Council of Forestry Research & Education (ICFRE)**.
5. Includes **digital platform** for registration, verification, and issuance of credits.
6. Encourages participation of **private sector, NGOs, and individuals**.

NATIONAL POLICY ON GEOTHERMAL ENERGY, 2025

Recent Update: MNRE notified India's **first National Policy on Geothermal Energy** to accelerate **energy transition**.

About:

1. Utilizes **Earth's internal heat** for **power generation** and **heating**.
2. **High-enthalpy (>200°C)** for power; **low–medium (100–180°C)** for direct uses.
3. Promotes **clean baseload renewable energy**.
4. Supports **R&D, demonstration projects**, and **public–private partnerships**.
5. Aims to **diversify energy mix** and enhance **energy security**.

SOURCE: THE HINDU

BUILDING CLIMATE-RESILIENT CITIES IN INDIA

RECENT UPDATE: India's cities face rising risks from **flooding, heat waves, and cyclones**, prompting urgent calls for **climate-resilient urban planning**.

ABOUT:

1. **Two-thirds of residents** are vulnerable to **flooding** due to unchecked urbanisation and poor drainage.
2. Concrete cities trap heat, making them **3-5°C hotter**, increasing deaths and productivity losses.
3. **Poor design choices** in housing risk **locking in vulnerabilities** for decades.
4. Resilience is needed to **safeguard lives** and ensure continuity of growth since cities generate **70%+ of jobs and GDP**.
5. Initiatives include the **Sustainable Habitat Mission** and embedding resilience in the **Smart Cities Mission & AMRUT**.
6. **Ahmedabad** pioneered early warning, cooling centres, and public awareness through **Heat Action Plans**.
7. Key challenges are **Weak ULBs** (lack of staff/funds) and **Fragmented Governance** among agencies.
8. **Strategies** involve adopting **compact urban designs**, restricting construction in high-risk areas, and deploying **predictive flood warning systems**

RIVER POLLUTION IN INDIA

Recent Update: CPCB released report on “Polluted River Stretches for Restoration of Water Quality – 2025.”

About:

1. Identifies **polluted river stretches (PRS)** under **National Water Quality Monitoring Programme (NWMP)**.
2. PRS: Stretches with **Biochemical Oxygen Demand (BOD) >3 mg/L**.
3. Classified into **five priority classes** based on **BOD level**.
4. **296 polluted stretches** across **32 states/UTs**, reduced from **351 (2018)**.

5. **Maharashtra** has highest (54) polluted stretches.
6. Major polluted rivers: **Yamuna, Sabarmati, Chambal, Tungabhadra**.

GREAT NICOBAR ISLAND PROJECT

Recent Update: Ministry of Tribal Affairs sought report on **unsettled forest rights** before land diversion.



About:

1. Conceived by **NITI Aayog**, approved in **2021**.
2. Executed by **ANIIDCO**, a government undertaking.
3. Components: **Deep-sea port (Galathea Bay), international airport, 450 MW power plant, and modern township**.
4. Strategic project to boost **maritime logistics and connectivity**.
5. Concerns: **Forest diversion, tribal displacement, and ecological fragility**.

DAM SAFETY IN INDIA

Recent Update: IISER Bhopal assessed **sedimentation-induced vulnerabilities** in India's large reservoirs.

About:

1. Based on **CWC's Compendium on Sedimentation of Reservoirs in India**.
2. Many reservoirs lost **>50% storage capacity** due to **sedimentation**.

- 3. Regions most affected: **Himalayan Region, Western Ghats, and Narmada–Tapi basin.**
- 4. Causes: **Deforestation, soil erosion, unregulated land use, and monsoon runoff.**
- 5. Highlights need for **desilting, watershed management, and catchment conservation.**

DISASTER RISK FINANCING

Recent Update: Himachal Pradesh urged 16th Finance Commission to revise Disaster Risk Index (DRI) for hill states.

About:

- 1. **DRI:** Composite measure assessing **multi-hazard risk and vulnerability.**
- 2. Adopted by **15th Finance Commission (2021–26)** for **disaster fund allocation.**
- 3. Components: **Hazard (70%) and Vulnerability (30%)** scores.
- 4. Informs distribution of **NDRF and state contingency funds.**
- 5. Ensures **equitable, evidence-based financing** reflecting **local risk realities.**

SOURCE: INSIGHTS MONTHLY
STATE ENERGY EFFICIENCY INDEX (SEEI), 2024

Recent Update: Maharashtra, Andhra Pradesh, Assam, and Tripura are **top performers** in their respective groups in the **State Energy Efficiency Index 2024 (6th edition).*

About SEEI:

- 1. **Developed by:** Bureau of Energy Efficiency (BEE) in association with Alliance for an Energy Efficient Economy (AEEE)
- 2. **Purpose:** Assesses the **energy efficiency performance of 36 States and Union Territories (UTs),** promoting **data-driven monitoring, best practice sharing, and competitive improvement**
- 3. **Categories:**
 - **Front Runners:** >60%
 - **Achievers:** 50–60%

- **Contenders:** 30–50%
- **Aspirants:** <30%
- 4. **State Energy Efficiency Action Plans (SEEAPs):** Initiatives by BEE to integrate **energy efficiency** into **energy-intensive sectors**

MONSOON-RELATED EXTREME WEATHER EVENTS

Recent Update: Punjab floods, landslides, and flash floods in Uttarakhand, Himachal Pradesh, and J&K underline the rising **frequency and intensity** of **monsoon-related extreme weather events.**

Changing Nature of Monsoon:

- 1. **Erratic Rainfall Patterns:** Weakening **monsoon winds** but **increased atmospheric moisture,** causing **intense rainfall bursts** separated by **dry spells**
- 2. **Changing El Niño Relationship:** Weakened link between **El Niño** and **reduced monsoon rainfall** due to altered **global circulation patterns**
- 3. **Spatial Distribution:** **Humid regions** turning **drier,** and **dry regions** becoming **wetter** (e.g., Ganga basin decline, rain increase in Gujarat & Rajasthan)
- 4. **Climate Change:** **Rising temperatures** and **sea-levels** altering **monsoon dynamics,** enhancing **rainfall intensity**

STATE OF GLOBAL WATER RESOURCES 2024

Recent Update: World Meteorological Organization (WMO) report warns that the **global water cycle** is becoming **increasingly erratic,** swinging between **deluge and drought.**

Key Highlights:

- **Glacier Melt:** All global glacier regions record **third consecutive year of losses.** Many nearing **Peak Water Point**—the maximum annual melt runoff.

- **Erratic Water Cycle:** Two-thirds of river basins face too much or too little water, increasing extreme events (e.g., floods in Europe/Asia, droughts in Amazon Basin)

About Water Cycle:

- 1) **Definition:** Continuous movement of water between pools (storage) and fluxes (transfer)
- 2) **Impact of Climate Change:**
 - a) Intensifies evaporation and precipitation extremes
 - b) Leads to sea-level rise via melting glaciers and thermal expansion
 - c) Increases frequency of floods, droughts, hurricanes

GREY RHINO EVENT



Recent Update: Study found that Wayanad landslides were a Grey Rhino event.

About Grey Rhino:

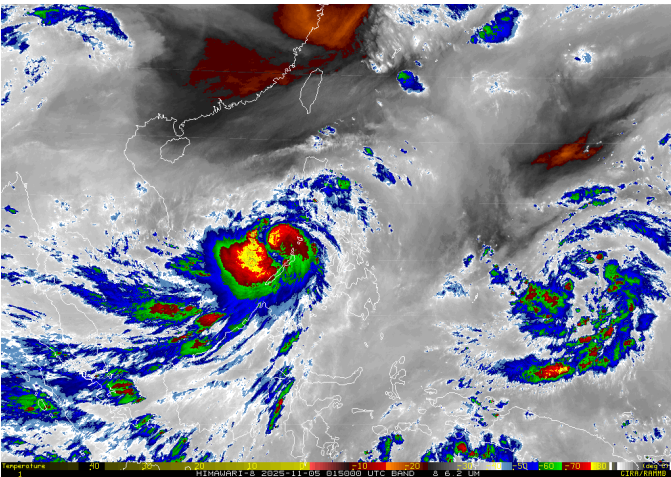
- 1) Defined as highly probable, high-impact but neglected events
- 2) Unlike Black Swan events (unpredictable surprises), Grey Rhinos occur after clear warnings

Wayanad Landslide as a Grey Rhino:

- 1) Happened in an identified landslide-prone area with repeated past events
- 2) Ignored by authorities, leading to preventable disaster

SUPER TYPHOON

Recent Update: Philippines struck by Super Typhoon Ragasa.



About Super Typhoon:

- 1) **Definition:** Tropical cyclone with wind speed >185 km/h (100 knots)
- 2) **Formation:** Over oceans with sea surface temp >26°C, typically >5° latitude from equator
- 3) **Structure:** Warm-core low-pressure with spiral inflow (surface) and spiral outflow (top)

Regional Terms:

- 1) **Hurricane:** North Atlantic, Eastern North & South Pacific
- 2) **Cyclone:** Indian Ocean
- 3) **Typhoon:** Western North Pacific
- 4) **Willy-Willy:** Southern Indian Ocean (east)

SOURCE: DRISHTI MONTHLY

INDIA'S APPROACH TO DIGITAL PUBLIC INFRASTRUCTURE (DPI)

RECENT UPDATE:

India launched India Stack Global (2025) to export its DPI model—comprising Aadhaar, UPI, DigiLocker, and CoWIN—to Africa and Southeast Asia.

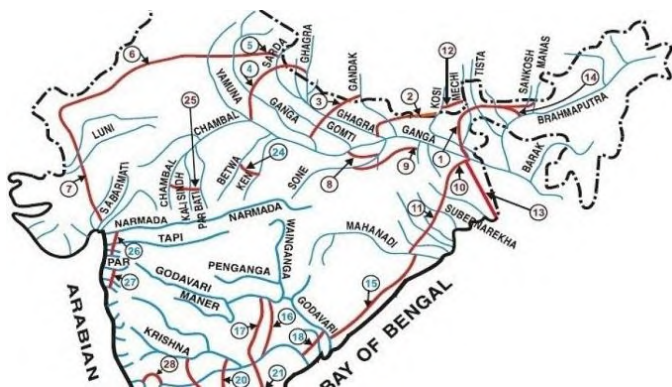
ABOUT:

1. **Definition:** DPI refers to **interoperable digital systems** enabling secure identity, payments, and data exchange.
2. **Key Components:**
 - **Identity Layer:** Aadhaar.
 - **Payment Layer:** UPI.
 - **Data Layer:** DigiLocker, CoWIN, ONDC.
3. **Achievements:** Facilitated **10 billion monthly UPI transactions**; boosted inclusion and transparency.
4. **Institutional Drivers:** MeitY, NPCI, and India Stack Ecosystem.
5. **Global Recognition:** Adopted by **Philippines, Kenya, and UAE** as a model for inclusive fintech.
6. **Challenges:** **Privacy gaps, cyber threats**, and lack of **data localization** clarity.
7. **Policy Measures:** **Digital Personal Data Protection Act (2023)** ensures user consent and security.
8. **Way Forward:** Implement **data embassies, open API governance**, and ensure **global interoperability**.

WATER SECURITY AND INTERLINKING OF RIVERS

RECENT UPDATE:

The **Ken–Betwa Link Project (Phase-I)** began implementation in **2025**, expected to benefit **13 lakh hectares** across **Uttar Pradesh and Madhya Pradesh**, marking India's first river interlinking milestone.



ABOUT:

1. **Objective:** Ensure **water security**, manage **floods and droughts**, and promote **balanced irrigation**.
2. **Background:** Part of **National Perspective Plan (1980)** by the **Ministry of Jal Shakti**.
3. **Major Projects:**
 - **Ken–Betwa (Bundelkhand).**
 - **Godavari–Cauvery** under preparation.
 - **Damanganga–Pinjal and Par–Tapi–Narmada** in pipeline.
4. **Benefits:** Enhances **irrigation, hydropower (103 MW)**, and **drinking water** for rural areas.
5. **Environmental Concerns:** **Deforestation, wildlife displacement**, and **altered hydrology**—especially in **Panna Tiger Reserve**.
6. **Financial Outlay:** ₹44,000 crore shared between Centre and States; backed by **National Interlinking of Rivers Authority (NIRA)**.
7. **Judicial Context:** *Narmada Bachao Andolan (2000)* upheld interlinking with environmental safeguards.
8. **Way Forward:** Adopt **basin-level planning**, strengthen **EIA processes**, and promote **community participation**.

INDIA'S CLEAN ENERGY TRANSITION AND JUST TRANSITION PLAN

RECENT UPDATE:

India released its first **Just Transition Roadmap (2025)** outlining strategies to retrain **coal-sector workers** and redevelop **mining regions** into **green industrial clusters**.

ABOUT:

1. **Definition:** “Just Transition” ensures **social and economic fairness** in the shift from fossil fuels to renewable energy.
2. **Context:** India pledged **Net Zero by 2070** at **COP26**; renewables now contribute **44% of installed capacity (2025)**.
3. **Policy Framework:**

- **National Electricity Plan (2023–32).**
 - **Energy Conservation Act Amendment (2022).**
 - **National Solar Mission (2010) & Hydrogen Mission (2023).**
4. **Employment Impact:** Transition could affect **13 million coal jobs**; retraining essential.
 5. **Institutional Mechanism:** **NITI Aayog, MNRE,** and **Coal Ministry** collaborating on reskilling initiatives.
 6. **Challenges:** **Regional disparities, land conflicts,** and **financial constraints.**
 7. **Opportunities:** Expansion in **solar, wind, and hydrogen sectors,** and **green manufacturing zones.**
 8. **Way Forward:** Establish **Just Transition Fund,** incentivize **skill programs,** and ensure **social dialogue** for inclusivity.

URBAN HEAT ISLAND EFFECT AND CLIMATE-RESILIENT CITIES

RECENT UPDATE:

The **National Disaster Management Authority (NDMA)** issued updated **Heat Action Guidelines (2025)** for 100 cities to mitigate urban heat island effects through **green cover expansion** and **cool roofing programs.**

ABOUT:

1. **Definition:** Urban Heat Islands (UHI) are **urban areas significantly warmer** than rural surroundings due to concrete, traffic, and pollution.
2. **Current Situation:** 80% of Indian cities now record **>2°C higher temperatures** than nearby rural zones.
3. **Contributing Factors:** **Deforestation, vehicular emissions, population density,** and **unplanned construction.**
4. **Health Impact:** Heat-related deaths rose by **54% (2010–2024);** vulnerable groups include **elderly, outdoor workers,** and **infants.**
5. **Policy Framework:**

- **National Climate Change Mission (NAPCC).**
 - **National Mission on Sustainable Habitat (NMSH).**
 - **Smart Cities Mission** integrated with urban cooling measures.
6. **City Innovations:** **Ahmedabad’s Heat Action Plan,** **Surat’s cool pavements,** and **Delhi’s tree canopy drive.**
 7. **Technology Use:** **Urban climate modelling, reflective paints,** and **AI-based forecasting** adopted.
 8. **Way Forward:** Expand **green infrastructure,** promote **climate-sensitive urban planning,** and integrate **heat resilience in building codes.**

SOURCE: INDIAN EXPRESS

INDIA’S BIODIVERSITY POLICY AND ACCESS TO BIOLOGICAL RESOURCES

RECENT UPDATE:

The **Biological Diversity (Amendment) Act, 2023** was operationalized in **2025,** simplifying permissions for **AYUSH industries** while strengthening **benefit-sharing with local communities.**

ABOUT:

1. **Objective:** To promote **sustainable use, conservation,** and **equitable benefit sharing (ABS)** of biological resources.
2. **Legal Framework:**
 - **Biological Diversity Act, 2002;** amended in **2023.**
 - Aligns with **Convention on Biological Diversity (CBD, 1992)** and **Nagoya Protocol (2010).**
3. **Institutional Structure:**
 - **National Biodiversity Authority (NBA).**
 - **State Biodiversity Boards (SBBs).**

- **Biodiversity Management Committees (BMCs)** at local level.

4. Key 2023 Amendments:

- Simplifies access for **AYUSH, research, and seed industries**.
 - **Decriminalizes minor violations**.
 - Recognizes **codified traditional knowledge**.
5. **Benefit Sharing:** Industries to contribute to the **National Biodiversity Fund** for local community development.
6. **Concerns:** **Dilution of local control**, risk of **biopiracy**, and **corporate dominance** in resource use.
7. **Judicial Context:** *Divya Pharmacy v. Uttarakhand Biodiversity Board (2018)* upheld benefit-sharing as mandatory.
8. **Way Forward:** Strengthen **community rights**, enhance **ABS monitoring**, and integrate **digital bio-registries**.

INDIA'S WETLAND CONSERVATION STRATEGY

RECENT UPDATE:

India's total **Ramsar sites** rose to **82 (2025)** after the inclusion of **Wular Lake (J&K)** and **Tampara Lake (Odisha)**, reaffirming India's global wetland commitment.

ABOUT:

1. **Definition:** Wetlands are areas of **marsh, fen, peatland, or water**, crucial for **biodiversity and carbon sequestration**.
2. **Policy Framework:**
 - **Wetlands (Conservation and Management) Rules, 2017**.
 - **Ramsar Convention, 1971** – India a signatory since 1982.
3. **Institutional Structure:** **National Plan for Conservation of Aquatic Ecosystems (NPCA)** under **MoEFCC**.

4. **Current Statistics:** 82 Ramsar sites covering **1.3 million ha**, with Tamil Nadu having the highest (16).
5. **Threats:** **Urban encroachment, pollution, drainage, and unregulated tourism**.
6. **Judicial Intervention:** *M.K. Balakrishnan (2017)* directed states to identify and protect wetlands.
7. **Community Role:** Encouraging **eco-tourism, birdwatching, and wetland-based livelihoods**.
8. **Way Forward:** Strengthen **GIS-based mapping**, integrate **climate resilience**, and promote **"Mission Amrit Sarovar"-linked restoration**.

INDIA'S FOREST POLICY AND LAND RESTORATION GOALS

RECENT UPDATE:

Under **UNCCD COP16 (2025)**, India reaffirmed its target of **restoring 26 million hectares** of degraded land by **2030**, aligning with the **National Forest Policy (Draft 2023)**.

ABOUT:

1. **Objective:** Increase **forest and tree cover to 33%**, combat **land degradation**, and enhance **carbon sequestration**.
2. **Legal Framework:**
 - **Indian Forest Act, 1927**.
 - **Forest Conservation Act, 1980**, and **Amendment 2023**.
3. **Institutional Structure:** **MoEFCC, State Forest Departments, and CAMPA Fund** for afforestation.
4. **Draft 2023 Forest Policy:** Emphasizes **eco-restoration, community-based management, and carbon finance**.
5. **Major Initiatives:**
 - **Green India Mission**.
 - **National Afforestation Programme**.
 - **Land Degradation Neutrality Fund**.

- 6. **Achievements:** India's forest cover increased to **24.6% (FSI Report 2023)**; mangrove area grew by **1.1%**.
- 7. **Concerns:** Diversion for infrastructure, encroachments, and tribal displacement.
- 8. **Way Forward:** Promote **eco-sensitive zoning**, **PPP-based afforestation**, and **climate-smart forestry**.

INDIA'S COASTAL MANAGEMENT POLICY

RECENT UPDATE:

The **Coastal Regulation Zone (CRZ) Notification, 2019** was revised in **2025**, permitting **eco-tourism infrastructure** and **renewable energy projects** in selected CRZ-II areas under strict safeguards.

ABOUT:

- 1. **Objective:** Balance **coastal development** with **environmental protection** and **livelihood security**.
- 2. **Legal Framework:**
 - o **Environment (Protection) Act, 1986.**
 - o **CRZ Notification, 2011 & 2019.**
- 3. **Zoning Categories:**
 - o **CRZ-I:** Ecologically sensitive areas.
 - o **CRZ-II:** Developed coastal areas.
 - o **CRZ-III:** Rural and relatively undisturbed zones.
 - o **CRZ-IV:** Water area up to 12 nautical miles.
- 4. **Institutional Setup:** **NCZMA** and **SCZMAs** oversee implementation.
- 5. **Revised 2025 Rules:** Allow **offshore wind, tidal, and solar projects** with strict EIA clearance.
- 6. **Achievements:** Coastal zone mapping completed for **all 13 coastal states/UTs** using **GIS tools**.
- 7. **Challenges:** **Unregulated tourism**, **rising sea levels**, and **loss of mangroves**.

- 8. **Way Forward:** Strengthen **integrated coastal management (ICZM)** and promote **community-based blue economy initiatives**.

INDIA'S NATIONAL ADAPTATION PLAN ON CLIMATE CHANGE (NAPCC)

RECENT UPDATE:

The **Ministry of Environment, Forest and Climate Change (MoEFCC)** released an **NAPCC Review Report (2025)** emphasizing **climate-resilient agriculture**, **urban adaptation**, and **water management**.

ABOUT:

- 1. **Origin:** Launched in **2008** as part of India's **climate strategy** post-UNFCCC commitments.
- 2. **Structure:** Comprises **8 National Missions**—including **Solar Mission**, **Water Mission**, and **Green India Mission**.
- 3. **Recent Additions:** **Waste to Wealth**, **Health**, and **Cooling Action Plan Missions** added in 2023.
- 4. **State Integration:** All states directed to prepare **State Action Plans on Climate Change (SAPCC)**.
- 5. **Implementation Focus (2025):** Adaptation in **agriculture**, **water**, **forestry**, and **coastal ecosystems**.
- 6. **Funding:** Supported by **National Adaptation Fund (₹3,500 crore)** and **Green Climate Fund (GCF)**.
- 7. **Monitoring Mechanism:** **Climate Change Cell** in MoEFCC tracks progress using performance indicators.



TOPICS COVERED-

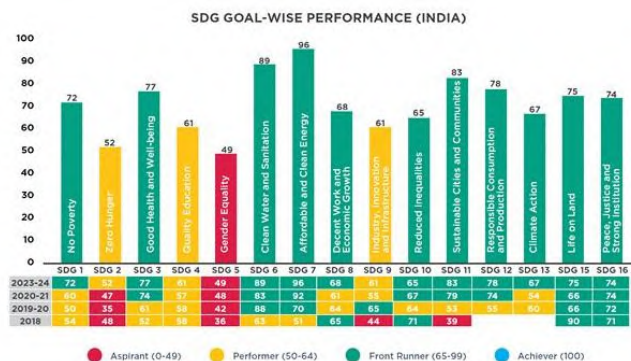
1. 10 Years of SDGs: India's Progress — Brundtland, Agenda 2030, global lag, India integration
2. Cold Desert Biosphere Reserve — Ladakh-HP span, snow leopard, UNESCO MAB
3. Environmental Accounting on Forest 2025 Report — SEEA, forest cover rise, GDP valuation
4. Greenhouse Gas Emission Intensity Target Rules 2025 — CCTS, CPCB enforcement, carbon credits
5. Ozone Pollution — ground-level ozone, NO_x-VOC chemistry, urban hotspots
6. New Ramsar Sites in Bihar — Gokul Reservoir, Udaipur Lake, migratory birds
7. Global Forest Resources Assessment 2025 — global forest cover, India rank, carbon stocks
8. State of Finance for Forests 2025 — \$216B gap, public finance dominance, blended models
9. IUCN World Conservation Congress 2025 — Abu Dhabi Call, ecocide, synthetic biology policy
10. Update to IUCN Red List (India Birds) — uplisting species, grassland threats, global decline
11. First IUCN Green Status of Tiger — critically depleted, recovery potential, threats
12. Status of Elephants in India (SAIEE 2021-25) — 22,446 elephants, fragmentation, conflict
13. Indian Wolf (*Canis lupus pallipes*) — distinct lineage, grassland loss, Vulnerable
14. UNEP Adaptation Gap Report 2025 — \$310-365B need, falling finance, COP30 warning
15. COP30 and Global Climate Diplomacy — Amazon-hosted, NCQG, just transition, CBAM debate
16. State of Finance for Forests (SFF) 2025 Report — \$84B vs \$300B needed, zero-deforestation gap
17. Forest Declaration Assessment 2025 — 8.1 M ha loss, commodity deforestation, restoration gap
18. IUCN World Heritage Outlook 2025 — site health, India's natural sites, emerging threats
19. Cost of Convenience: Health Hazards of Digital Tools — e-waste surge, informal burning, EPR gaps
20. Production Gap Report 2025 — fossil overproduction, coal misalignment, global subsidies
21. World Network of Biosphere Reserves (WNBR) — 785 sites, MAB, tri-zonal model
22. Carbon Capture, Usage and Storage (CCUS) — capture methods, storage, fossil lock-in concerns
23. SAIME Model (Sundarbans Aquaculture) — mangrove-shrimp integration, FAO recognition
24. Rethinking Development in the Fragile Himalayas — landslides, unsustainable projects, climate stress
25. Africa's Climate Resilience: Homegrown Solutions — warming, debt stress, hybrid adaptation
26. Civil Society & the Climate Imperative (Global South Unity) — fragmentation, BRICS+, just transition
27. National Biodiversity Authority & Benefit Sharing — low ABS disbursal, traceability gaps
28. Climate Change & Himalayan Wildlife — species shifting upslope, CMS, corridor need
29. New Zealand's Oceans Warming Faster — sea-level rise, species migration, coastal risks
30. Great Green Wall: Ambition vs Reality — low vegetation gains, funding gaps, agroforestry
31. Sukapaika River Restoration (Odisha) — tributary revival, community movement
32. Barren Island Volcano Eruption — tectonics, eruption history, climate links
33. Orcas (Killer Whales) — apex predator, pods, global distribution
34. Painted Storks — Near Threatened, wetland habitats, fish-based diet
35. Vulture Conservation Portal — 9 species, diclofenac threat, conservation breeding

36. Lemongrass — citronella, Aroma Mission, export crop
37. Hilsa Fish (Ilish) — anadromous, Bangladesh dominance, cultural value
38. Himalayan Brown Bear — critically endangered, alpine habitats, conflict
39. Red Ivy Plant (*Strobilanthes alternata*) — wound-healing compounds, nanofiber pad
40. Biodiversity Heritage Site (BHS) — BDA 2002, BMCs, sacred groves
41. Garra nambashiensis — new fish species, Chindwin basin, evolution insights
42. Saunders's Tern — coastal breeder, Indian Ocean range, LC
43. Adyar Estuary — Chennai estuary, flood buffer, restoration
44. Red-necked Phalarope — circumpolar migrant, role reversal, first TN record
45. Striped Dolphin — offshore species, pod behaviour, threats
46. Papikonda National Park — Eastern Ghats, herpetofauna, Konda Reddy tribe
47. Iridogorgia chewbacca — deep-sea coral, spiral form, biodiversity value
48. Lactifluus khasianus — edible mushroom, Khasi pine symbiosis
49. Udaipur Jheel (Ramsar Site) — Bihar wetland, pochard habitat, hydrological role
50. Yellow-tailed Ashy Skimmer — dragonfly indicator species, new Delhi sighting
51. SODAR System — wind profiling, inversion tracking, pollution studies
52. Swachh Shehar Jodi (SSJ) — mentor–mentee sanitation model, waste reforms
53. Lachipora Wildlife Sanctuary — markhor, hangul, IBA recognition

SOURCE: VISION MONTHLY

10 YEARS OF SDGS: INDIA'S PROGRESS

Recent Update: The UN's Sustainable Development Goals completed ten years since adoption in 2015, prompting a global review of progress and remaining gaps.

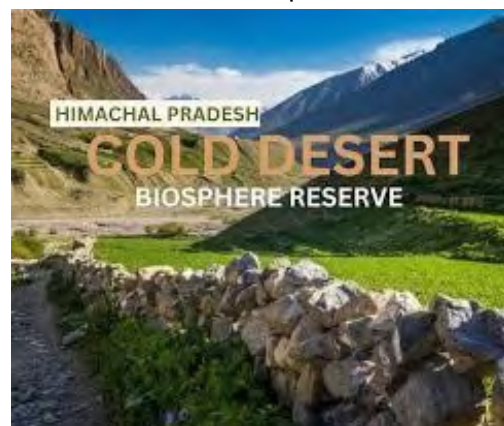


About:

1. Sustainable development was formally defined in the 1987 Brundtland Report as development that fulfills present needs without compromising the ability of future generations to meet theirs.
2. The 2030 Agenda for Sustainable Development, adopted by all UN member states in 2015, established a universal framework consisting of **17 SDGs and 169 targets**.
3. The SDGs aim to eradicate poverty, reduce inequality, protect natural ecosystems, and promote inclusive prosperity across all nations by 2030.
4. The framework emphasizes the principle of **leaving no one behind**, ensuring that development benefits reach the most vulnerable populations.
5. Globally, only **17% of SDG targets** are currently on track, highlighting the need for accelerated action and policy coherence.
6. Finland leads the 2025 SDG Index, with East and South Asia demonstrating the fastest progress since 2015 due to accelerated socio-economic development.
7. Significant global gains have been recorded in access to electricity, internet use, mobile broadband, and childhood mortality reduction.
8. India continues to integrate SDG priorities through national policies, monitoring dashboards, and state-level action plans.

COLD DESERT BIOSPHERE RESERVE

Recent Update: UNESCO has designated the Cold Desert Biosphere Reserve as part of its 2025 additions to the World Network of Biosphere Reserves.



About:

1. The Cold Desert Biosphere Reserve is India's first high-altitude cold desert reserve, representing one of the driest and coldest biomes within UNESCO's global network.
2. It spans regions from **Ladakh** to **Himachal Pradesh**, covering areas such as Leh, Kargil, Spiti Valley, and Kinnaur district.
3. The reserve includes key protected areas like **Pin Valley National Park**, Chandratol, Sarchu, and the **Kibber Wildlife Sanctuary**, forming a diverse conservation landscape.
4. Its cold desert conditions arise from its **rain-shadow location** behind the Himalayas and extremely high elevation, creating a unique ecological niche.
5. Vegetation consists of hardy species such as juniper, seabuckthorn, ephedra, and artemisia, adapted to low moisture and severe winters.
6. Iconic fauna includes the **Snow Leopard**, Himalayan Ibex, Tibetan Argali, Bharal, Red Fox, Lynx, and Himalayan Wolf.
7. The region hosts culturally rich Buddhist communities known for monasteries, chortens, and traditional agro-pastoral livelihoods.
8. The site contributes to UNESCO's Man and Biosphere Programme, promoting harmony between local communities and fragile ecosystems.

ENVIRONMENTAL ACCOUNTING ON FOREST 2025 REPORT

Recent Update: MoSPI released the 8th Environmental Accounting Report, with the 2025 edition focusing exclusively on forest accounts.

About:

1. The report adopts the **UN-SEEA framework**, providing a standardized method for assessing forest assets, ecosystem health, and economic value.
2. India's forest cover expanded by **17,444 sq km** between 2010–11 and 2021–22, reflecting long-term improvements in forest conservation.
3. Forest extent increased by an additional **3,356 sq km** between 2013 and 2023 due to reclassification and boundary corrections.
4. Growing stock, a measure of usable wood volume, rose by **305.53 million cubic meters**, indicating healthier forest ecosystems.
5. Provisioning services, including timber and non-timber products, contributed **0.16% of GDP**, showing measurable economic value.
6. Regulating services such as carbon retention contributed **2.63% of GDP**, underlining forests' critical climate-stabilizing role.
7. States such as Maharashtra, Gujarat, Kerala, Arunachal Pradesh, and Uttarakhand were major contributors across different service categories.
8. The report strengthens environmental-economic planning by integrating natural capital into national and state-level decision-making.

GREENHOUSE GAS EMISSION INTENSITY (GEI) TARGET RULES 2025

Recent Update: India notified its first legally binding GEI Target Rules for four major emission-intensive sectors.

About:

1. The rules require facilities in aluminium, cement, pulp & paper, and chlor-alkali sectors to reduce emissions per unit of output compared to a 2023–24 baseline.
2. They are issued under the compliance framework of the **Carbon Credit Trading Scheme (CCTS), 2023**, forming the basis for a regulated carbon market.
3. The CPCB is responsible for enforcing compliance, ensuring uniform monitoring across industrial units.
4. Facilities that reduce emissions beyond targets earn **tradable carbon credit certificates**, promoting a market-driven mitigation mechanism.
5. The BEE issues credit certificates, which eligible entities may sell on the domestic carbon market to generate revenue.

6. Non-compliant units must purchase additional credits or pay environmental compensation equal to twice the annual average credit price.
7. The rules enhance transparency through mandatory documentation on the **Indian Carbon Market portal**.
8. They strengthen India's pathway toward its **Paris Agreement commitments**, especially its target of reducing emission intensity of GDP.

OZONE POLLUTION

Recent Update: CPCB reported that Delhi-NCR recorded the highest levels of ground-level ozone pollution in India, followed by the Mumbai Metropolitan Region.



About:

1. Ozone is a triatomic oxygen molecule that functions beneficially in the stratosphere but becomes a harmful pollutant in the troposphere.
2. Stratospheric ozone provides essential protection from ultraviolet radiation, while ground-level ozone adversely affects human health and vegetation.
3. India's safe limits are set at **100 µg/m³ (8-hour average)** and **180 µg/m³ (1-hour)** for ambient ozone concentration.
4. Ground-level ozone forms through reactions between **NOx and VOCs** in the presence of sunlight, making it a secondary pollutant.
5. Anthropogenic contributors include vehicles, power plants, industrial operations, and urban combustion activities.
6. Natural factors such as soil emissions, wildfires, and biospheric methane also influence ozone formation.
7. Ground-level ozone persists from hours to weeks, enabling regional transport and increasing exposure risks.
8. Rising ozone levels highlight urban air quality challenges and the need for coordinated emission-control policies.

NEW RAMSAR SITES IN BIHAR

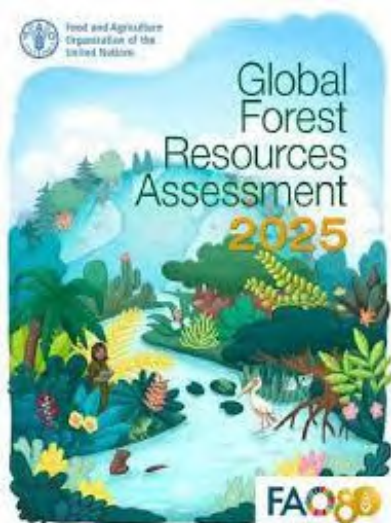
Recent Update: Gokul Reservoir and Udaipur Lake were added as new Ramsar sites, increasing India's total to 93 wetlands of international importance.

About:

1. Both wetlands are **oxbow lakes**, formed when meandering rivers create isolated crescent-shaped water bodies.
2. Gokul Reservoir lies along the southern edge of the Ganga River and supports rich aquatic biodiversity.
3. Udaipur Lake, located within the Udaipur Wildlife Sanctuary, serves as a critical wintering habitat for migratory waterbirds.
4. Species such as the **Common Pochard** depend on these wetlands for seasonal refuge and feeding.
5. The Ramsar Convention, adopted in 1971, provides an international framework for conserving and sustainably using wetlands.
6. Wetlands qualify for Ramsar status if they meet at least **one of nine criteria**, including supporting sizable waterbird populations.
7. India ratified the convention in 1982 and has since expanded its wetland conservation network across multiple states.
8. The new sites enhance Bihar's ecological value and strengthen India's commitments to wetland preservation.

GLOBAL FOREST RESOURCES ASSESSMENT (GFRA) 2025

Recent Update: FAO released the Global Forest Resources Assessment 2025 at the GFOI Plenary in Bali, providing a comprehensive global review of forest trends.



About:

1. GFRA, published every five years, evaluates global forest extent, biodiversity, biomass, carbon

stocks, and management practices using standardized methodologies.

2. Forests currently cover **4.14 billion hectares**, representing **32%** of total global land area, with nearly half located in tropical regions.
3. Europe holds the world's largest forest area, accounting for one-fourth of global forests, reflecting strong conservation and afforestation policies.
4. India improved its ranking to **9th globally** in total forest area, comprising **2%** of global forest cover and ranking **5th** in rubber plantation area.
5. Global deforestation has declined significantly to **10.9 million ha annually (2015–25)**, compared to 17.6 million ha in 1990–2000.
6. Over **90%** of the world's forests are naturally regenerating, indicating a positive trend in ecosystem renewal.
7. Global forest carbon stock increased to **714 gigatonnes**, with soil holding the largest share, followed by living biomass and deadwood.
8. Disturbance patterns vary regionally—fires dominate subtropical forests, while temperate and boreal forests face threats from insects, diseases, and extreme weather.

SOURCE: THE HINDU

STATE OF FINANCE FOR FORESTS 2025

Recent Update: UNEP released the first State of Finance for Forests 2025, revealing large funding gaps for achieving global 2030 forest targets.

About:

1. The report identifies an annual **forest finance gap of USD 216 billion**, highlighting insufficient funding to meet global conservation and restoration goals.
2. Governments contributed **91%** of total forest-related funding in 2023, with limited private sector participation in sustainable forestry investments.
3. Current financial flows remain inadequate for achieving zero deforestation, large-scale restoration, and climate-resilient forest ecosystems.
4. The report urges blended finance models, private capital mobilisation, and carbon market mechanisms to close the gap.

5. Developing countries face the highest resource constraints, although they host most of the world's biodiversity-rich forests.
6. Forest-positive supply chains remain underfunded, limiting progress on reducing commodity-driven deforestation.
7. Stronger global coordination is needed to align climate finance with forest goals under the UNFCCC and CBD frameworks.
8. The report stresses that achieving SDG-15 and Paris climate goals is impossible without major scaling-up of forest finance.

IUCN WORLD CONSERVATION CONGRESS 2025

Recent Update: The IUCN World Conservation Congress concluded in Abu Dhabi, adopting major resolutions on global biodiversity governance.

About:

1. The Congress is IUCN's highest decision-making platform, held once every four years, bringing together states, NGOs, scientists, and civil society.
2. The **"Abu Dhabi Call to Action"** was adopted to accelerate global efforts on conservation, justice, multilateralism, innovation, and resources for nature.
3. Over **100 new members** joined IUCN, including six countries—Armenia, Tajikistan, Marshall Islands, Gabon, Tuvalu, and Zimbabwe.
4. IUCN adopted its **first-ever policy on synthetic biology**, addressing both opportunities (restoring genetic diversity, controlling invasive species) and risks (ecological disruptions).
5. The Congress formally recognized **ecocide**—deliberate and severe environmental destruction—as an international crime under the ICC framework.
6. Delegates called for scaling climate and biodiversity finance and strengthening Indigenous and community-led conservation models.
7. The forum highlighted the urgent need for evidence-based restoration and enhanced use of Earth observation tools.
8. The Congress reaffirmed the centrality of nature-based solutions in achieving Paris Agreement and Kunming–Montreal Global Biodiversity Framework targets.

UPDATE TO IUCN RED LIST OF THREATENED SPECIES (INDIA)

Recent Update: The 2025 Red List update revised the conservation status of 12 Indian bird species, uplisting

four of them due to ecosystem threats.

About:

1. Four species were uplisted—Indian Courser, Indian Roller, Rufous-tailed Lark (to Near Threatened), and Long-billed Grasshopper-warbler (to Endangered).
2. All four species depend heavily on **open natural ecosystems** such as grasslands, semi-arid zones, scrublands, croplands, and desert habitats.
3. These ecosystems are rapidly degrading due to agricultural intensification, power transmission infrastructure, invasive species, and misguided afforestation.
4. More than **50% of global bird species are in decline**, primarily due to habitat loss, fragmentation, and unsustainable land use.
5. Birds are critical ecological actors—pollinators, seed dispersers, scavengers, and pest regulators—making their decline an ecosystem-level threat.
6. Three Arctic seal species were uplisted due to sea ice loss from global warming, highlighting vulnerabilities of cryosphere-dependent species.
7. In a positive development, the **Green Sea Turtle** improved from Endangered to Least Concern owing to decades of targeted conservation measures.
8. The updated Red List serves as a crucial tool for guiding species recovery plans, habitat protection, and global conservation funding priorities.

FIRST IUCN GREEN STATUS OF SPECIES ASSESSMENT FOR THE TIGER

Recent Update: IUCN released the first-ever Green Status assessment for the tiger, classifying it as "Critically Depleted."



About:

1. The assessment evaluates species recovery, complementing the Red List's focus on extinction risk by measuring progress toward ecological functionality.
2. Tigers are now extinct in **9 of 24 global regions** historically occupied, and populations are threatened in all remaining spatial units.
3. The global population estimate of mature tigers ranges between **2,608–3,905**, with India holding nearly 75% of the remaining wild population.
4. Key threats include habitat fragmentation, prey depletion, poaching, and historical local extinctions.
5. The species shows **high conservation legacy**, reflecting decades of successful interventions like Project Tiger.
6. Recovery potential is assessed as **medium**, requiring sustained habitat expansion, connectivity, and anti-poaching measures.
7. Under the Green Status framework, full species recovery requires viability across entire historical range and restoration of ecological roles.
8. The Tiger remains listed as **Endangered (IUCN)**, Schedule I (WPA 1972), and CITES Appendix I, mandating highest protection.

STATUS OF ELEPHANTS IN INDIA: SAIEE 2021–25

Recent Update: India released its first DNA-based elephant population estimate under the SAIEE programme.



About:

1. The report estimates **22,446 Asian Elephants**, affirming India as home to nearly **60% of the global wild population**.
2. Elephants persist mainly across four landscapes—the Himalayan foothills, Northeast, East-Central India, and Western/Eastern Ghats.

3. The **Western Ghats** host the largest elephant population, followed by Northeast Hills and Brahmaputra floodplains.
4. Karnataka remains India's top elephant-bearing state, followed by Assam, Tamil Nadu, and Kerala.
5. Rapid habitat fragmentation from plantations, encroachment, linear infrastructure, and developmental projects threatens traditional movement corridors.
6. Human–Elephant Conflict is rising sharply in Central India and Eastern Ghats, driven by shrinking habitats and shifting crop patterns.
7. Electrocutions, rail accidents, and powerline collisions are major anthropogenic mortality causes.
8. Recommendations emphasize restoring corridors, regulating infrastructure, ecological planning, and strengthening landscape-level protection.

INDIAN WOLF (CANIS LUPUS PALLIPES)

Recent Update: IUCN evaluated the Indian Wolf separately for the first time, considering it a potential distinct species within the Canis genus.



About:

1. The Indian wolf inhabits thorn forests, scrublands, and arid–semiarid grasslands across peninsular and western India, with small populations in Pakistan.
2. It is among the most commonly encountered large carnivores in India's agro-pastoral landscapes.
3. Its distinct morphology and genetic traits prompted IUCN to evaluate it separately from other wolf species.
4. Habitat loss due to agricultural expansion, infrastructure, and grassland conversion poses major threats.
5. Conflict with pastoral communities arises from livestock predation and declining wild prey.

6. Disease transmission from domestic dogs further endangers populations.
7. It is currently classified as **Vulnerable** on the IUCN Red List.
8. Conservation revival depends on grassland protection—an often-ignored ecosystem in Indian policy.

UNEP ADAPTATION GAP REPORT 2025

Recent Update: UNEP released the Adaptation Gap Report 2025 warning that the climate adaptation finance gap for developing countries has widened sharply.

About UNEP Adaptation Gap Report 2025

1. **Flagship UNEP Assessment:** An annual report tracking global progress in **climate adaptation planning, implementation and finance**, assessing alignment with global resilience goals.
2. **Published By:** Prepared by the **UNEP–Copenhagen Climate Centre** with contributions from global climate institutions and experts.
3. **Aim:** Evaluates whether nations—especially **developing countries**—are adapting fast enough and quantifies the global **adaptation finance gap** to inform UNFCCC negotiations.
4. **Massive Finance Gap:** Developing countries require **US\$ 310–365 billion annually by 2035**, while actual flows are only **US\$ 26 billion (2023)**, a 12–14× shortfall.
5. **Falling Commitments:** Adaptation finance dropped from **US\$ 28 billion (2022)**, making the Glasgow Pact pledge to **double finance by 2025** unachievable.
6. **Debt-heavy Support:** Around **58%** of adaptation finance is **loan-based**, increasing the debt burden and inequality for vulnerable economies.
7. **Planning Progress Uneven:** Although **172 countries** have at least one **National Adaptation Plan (NAP)**, **36 plans are outdated**, reducing implementation effectiveness.
8. **Warning to COP30:** The report highlights inadequate preparedness for intensifying climate risks and urges ambitious financing decisions at **COP30 (Belém)**.

COP30 AND GLOBAL CLIMATE DIPLOMACY

Recent Update: COP30 will be held in Belém, Brazil (Nov 2025), amid rising climate anxiety and uncertainty around achieving the 1.5°C pathway.

About COP30 and Global Climate Diplomacy

1. **Shift to Implementation:** COP30 is branded as the **“COP of Action”**, signalling a shift from setting climate targets to **delivering finance, technologies, and real-world climate solutions**.
2. **New Climate Finance Goal:** Negotiations will establish the **New Collective Quantified Goal (NCQG)**, expected to scale climate finance to **US\$ 300 billion annually by 2035**.
3. **Baku–Belém Roadmap:** A proposed pathway to mobilize **US\$ 1.3 trillion** through **public–private partnerships**, innovative green instruments, and multilateral financing platforms.
4. **Amazon-Centric Priorities:** Hosting COP in the Amazon region emphasizes **forest conservation, indigenous rights, and biodiversity-focused climate policies**.
5. **Just Transition & Carbon Markets:** Developing nations will challenge the EU’s **Carbon Border Adjustment Mechanism (CBAM)** and push reforms for equitable carbon markets and green industrialization.
6. **Relevance of Multilateral Processes:** COPs provide **institutional continuity, agenda-setting power, neutral diplomacy**, and influence global policy and financial markets through collective decisions.
7. **Normative Strength:** Despite challenges, COPs uphold the moral and legal legitimacy of climate action, ensuring climate remains a **global public good**, not a fragmented national agenda.
8. **Key Challenges:** The **consensus rule** often creates negotiation paralysis, slowing progress on climate finance, loss & damage, and adaptation support for vulnerable nations.

SOURCE: INDIAN EXPRESS

STATE OF FINANCE FOR FORESTS (SFF) 2025 REPORT

Recent Update: UNEP released the first State of Finance for Forests 2025 revealing deep underfunding in global forest conservation.

About SFF 2025 Report

1. **Severe Underfunding:** Only **US\$ 84 billion** was invested in forests in 2023 against a required **US\$ 300 billion annually** to meet climate and biodiversity goals.
2. **Public Finance Dominance:** **91%** of forest finance came from governments, led by the **U.S. and China**, while tropical forest nations contributed just **17%**, reflecting regional inequality.

3. **Minimal Private Investment:** Private finance was just **US\$ 7.5 billion**, mainly through **certified commodity chains** and **impact investments**, with negligible support for high-risk tropical regions.
4. **Deforestation Drivers Unaddressed:** Despite forests causing **97%** of tropical land-use emissions, private capital remains absent from these critical zones.
5. **Nature-Based Solutions Need:** Meeting Rio Convention targets requires expanding **1 billion hectares** of restored or conserved forest by 2030.
6. **Cost Requirements:** **US\$ 32 billion/year** is needed for protected forests and avoided deforestation, while **US\$ 96 billion/year** is required for reforestation.
7. **Policy Gap Indicator:** The report warns that without tripling finance, forest-based climate mitigation pathways may become unattainable.
8. **Call for Private Sector Reform:** Urges stronger incentives for companies to finance **zero-deforestation supply chains** and long-term restoration projects.

THE FOREST DECLARATION ASSESSMENT 2025

Recent Update: The 2025 Assessment reports global deforestation at 8.1 million ha in 2024, showing the world is 63% off-track for the 2030 zero-deforestation target.

About The Forest Declaration Assessment 2025

1. **Global Forest Crisis:** Forest loss and degradation reached **8.1 M ha** and **8.8 M ha** respectively in 2024, with **tropical regions contributing 94%** of total loss.
2. **Carbon Emissions Surge:** Resulting emissions hit **3.1 Gt CO₂e**, exceeding **150% of U.S. energy-sector emissions**, undermining global climate goals.
3. **Primary Forests Threatened:** Nearly **6.7 M ha of tropical primary forests** were destroyed—irreplaceable ecosystems with high biodiversity value.
4. **Biodiversity Decline: Key Biodiversity Areas (fKBAs)** lost **2.2 M ha**, raising extinction risks for endemic species dependent on intact forest ecosystems.
5. **Restoration Failure:** Only **10.6 M ha** is under restoration—just **0.3% of global potential**—indicating poor progress toward global 2030 restoration pledges.

6. **Agriculture as Dominant Driver:** **86% of deforestation** is linked to conversion for **soy, palm oil, cattle pastures**, and other commodities.
7. **Infrastructure & Mining Impact:** Expanding **mineral extraction and road networks** enable illegal logging and fragment ecosystems.
8. **Climate-Driven Forest Stress:** The Amazon fires of 2024 emitted **791 Mt CO₂e**, worsening regional degradation and altering rainfall cycles.

IUCN WORLD HERITAGE OUTLOOK 2025

Recent Update: The 4th edition of the IUCN World Heritage Outlook was launched at the IUCN World Conservation Congress 2025 in Abu Dhabi.

About IUCN World Heritage Outlook 4

1. **What It Is:** A global assessment evaluating the **conservation status** of all natural and mixed **UNESCO World Heritage Sites** every 3–5 years.
2. **Published By:** Released by **IUCN** through its **World Heritage Programme** and the **World Commission on Protected Areas (WCPA)**.
3. **Aim:** Tracks conservation health, identifies threats, recognises **best management practices**, and guides site-level governance.
4. **India's Natural Heritage:** India has **7 natural and mixed sites**, representing **1.5% of global natural heritage area**.
5. **Improving Sites:** **Kaziranga and Manas** show improved ecological conditions due to anti-poaching, habitat restoration, and community participation.
6. **At-Risk Sites:** **Sundarbans** face salinity intrusion and sea-level rise, while the **Western Ghats** suffer from mining and land-use conflicts.
7. **Emerging Concerns:** **Nanda Devi** and **Great Himalayan National Park** are vulnerable to **glacial retreat** and invasive species.
8. **Policy Alignment:** Recognises India's **Wildlife Protection Amendment Act (2022)** and **LiFE Mission** as aligned with global biodiversity goals (KM-GBF 2030).

COST OF CONVENIENCE: HEALTH HAZARDS OF DIGITAL TOOLS

Recent Update: India's e-waste reached **2.2 million tonnes in 2025**, a 150% rise since 2017–18, amplifying public-health risks.

About Cost of Convenience: Health Hazards of Digital Tools

1. **India's E-waste Burden:** 65 cities generate **60% of India's e-waste**, with hotspots like **Seelampur**,

Moradabad, and Bhiwandi handling most informal recycling.

2. **Large Informal Sector:** Although 322 formal units can process 2.2 MT, **over 50%** of e-waste flows into unregulated **kabadiwala** networks.
3. **Respiratory Health Risks:** Open burning and acid-leaching release toxic **PM_{2.5}**, with studies showing **76–80%** of workers suffer chronic bronchitis and asthma.
4. **Neurological Damage:** Exposure to **lead, mercury, cadmium** severely harms child brain development and adult cognitive functions.
5. **Extended Producer Responsibility (EPR):** Makes producers legally responsible for **collection and recycling**, strengthening accountability.
6. **Mandatory Registration:** Recyclers and dismantlers must register to prevent unsafe operations and improve transparency.
7. **Incentives for Formalisation:** Policies encourage informal workers to shift to formal units through compliance-linked benefits.
8. **Persistent Enforcement Gaps:** Only **43%** of e-waste was formally processed (2023–24), with disputes over **EPR credit caps** slowing effective implementation.

THE PRODUCTION GAP REPORT 2025

Recent Update: The 2025 edition warns that countries plan to produce far more fossil fuels in 2030 than compatible with the 1.5°C pathway.

About the Production Gap Report 2025

1. **What It Is:** A global assessment tracking the mismatch between **planned fossil fuel production** and levels needed to limit warming to **1.5°C or 2°C**.
2. **Published By:** Jointly released by **SEI, Climate Analytics**, and **IISD**, with backing from the **United Nations**.
3. **Edition Details:** The **fifth edition**, first published in 2019, updating assessments from the 2023 report.
4. **Coal Misalignment:** Global coal output projected for 2030 is **500% higher** than the 1.5°C-consistent level, making it the most misaligned fuel.
5. **India Context:** India's **Coal Gasification Mission (2020)** aims to gasify **100 million tonnes** by 2030; gasification produces **syngas (CO + H₂)**.
6. **Fossil Fuel Overproduction:** Planned global fossil fuel production for 2030 is **120% higher** than 1.5°C limits and **77% higher** than 2°C limits.

7. **Rising Public Subsidies:** In 2023, India spent **₹726 billion** on oil and gas subsidies and seeks to increase gas share from **6.2% to 15%** by 2030.
8. **Major Contributors: China, U.S., and Russia** account for over half of global extraction-based emissions; 20 major producers contribute ~80% of global production.

WORLD NETWORK OF BIOSPHERE RESERVES (WNBR)

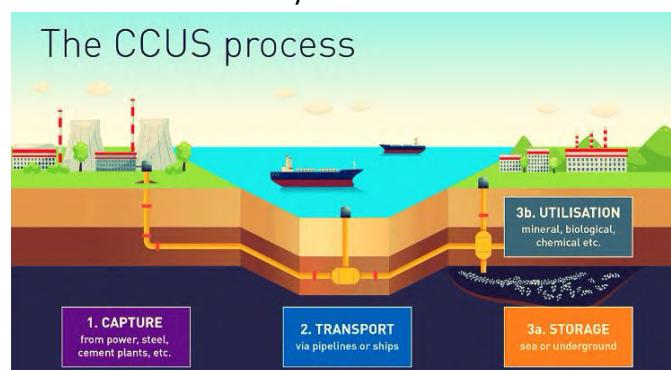
Recent Update: With new additions in 2025, WNBR now includes **785 sites** globally across 142 countries.

About WNBR

1. **What It Is:** A dynamic global network of designated sites promoting **ecological conservation, sustainable development, and scientific research**.
2. **Managed Under:** UNESCO's **Man and the Biosphere (MAB) Programme**, launched to improve human–environment interactions.
3. **Objective:** Strengthens **North–South and South–South cooperation** for research, training, and sharing of best conservation practices.
4. **International Collaboration:** Facilitates transfers of **knowledge, monitoring techniques**, and innovative conservation models.
5. **Global Coverage:** Expanded by **1 million sq km** since 2018—an area equivalent to **Bolivia**—bringing vast natural landscapes under protection.
6. **Site Functions:** Biosphere reserves serve as **learning laboratories** integrating conservation, community development, and scientific study.
7. **Tri-Zonal Structure:** Operates through **core, buffer, and transition zones** supporting biodiversity, research, and sustainable livelihoods.
8. **India's Position:** India has **13 BRs** within the WNBR network, including the newly added Cold Desert BR.

CARBON CAPTURE, USAGE AND STORAGE (CCUS)

Recent Update: Climate Analytics warns that Asia's large-scale CCUS plans may cause **25 billion tonnes of additional emissions** by 2050 due to fossil fuel lock-in.



About Carbon Capture, Usage and Storage (CCUS)

1. **Definition:** A suite of technologies that **capture CO₂** from industrial sources or directly from air, then **store or utilise** it to prevent atmospheric release.
2. **Three-Stage Process:** Involves **capture, transport, and storage/use** of CO₂ in geological formations or commercial applications.
3. **Capture Methods:**
 - **Post-combustion:** Separates CO₂ from flue gases using solvents.
 - **Pre-combustion:** Produces a hydrogen–CO₂ mix, separating CO₂ before combustion.
 - **Oxy-fuel combustion:** Burns fuel in oxygen, producing a CO₂-rich stream.
4. **Transport:** Captured CO₂ is compressed and moved via **pipelines, ships, or tankers**.
5. **Storage:** Injected into **saline aquifers, depleted oil/gas fields**, or used for enhanced oil recovery, chemicals, and materials.
6. **Climate Mitigation Role:** Reduces emissions in **hard-to-abate sectors** like cement, steel, and chemicals; supports low-carbon **hydrogen** production.
7. **Carbon Removal Technologies:** Includes **BECCS** (bioenergy with CCS) and **DACCS** (direct air capture with storage).
8. **Concerns:** Many Asian CCUS projects risk prolonging fossil fuel use, causing **emissions lock-in** rather than meaningful reductions.

SUNDARBANS' SAIME MODEL WINS FAO GLOBAL RECOGNITION

Recent Update: FAO has conferred **Global Technical Recognition** on the SAIME model for sustainable aquaculture in West Bengal's Sundarbans.



About the SAIME Model

1. **Nature of Model:** A **community-based** aquaculture system balancing **mangrove conservation** with **livelihood generation**.

2. **Mangrove Integration:** **5–30% of pond area** is kept under mangrove cover, supporting ecological restoration.
3. **Sustainable Aquaculture:** Mangrove litter is used as **natural fodder** for **Black Tiger Shrimp**, reducing chemical inputs.
4. **Climate Adaptation:** Helps enhance resilience against **sea-level rise**, salinity intrusion, and coastal erosion.
5. **Economic Benefits:** Increases farmer income through **high-value shrimp cultivation** and reduced input costs.
6. **Biodiversity Support:** Mangroves provide habitat for fish, crabs, and juvenile species, boosting productivity.
7. **Low-Carbon Model:** Mangrove-based ponds act as **carbon sinks**, supporting blue-carbon strategies.
8. **Replicable Approach:** Provides a scalable model for climate-resilient coastal aquaculture globally.

SOURCE: DOWN TO EARTH

RETHINKING DEVELOPMENT IN THE FRAGILE HIMALAYAS

Recent Update: Repeated floods, landslides, and glacial bursts in 2024–25 have highlighted the Himalayan region's ecological fragility and planning failures.

About:

1. The Himalayas support nearly **240 million people**, functioning as climate regulators and source regions for major rivers, yet face increasing anthropogenic stress.
2. Rapid expansion of **highways, tunnels, and hydropower projects** without adequate geological assessment has destabilized slopes and aquifers.
3. Events such as **Joshimath subsidence** and **Chamoli disaster** reflect cumulative effects of unregulated construction in hazard-prone areas.
4. **NDMA reports** indicate a doubling of “compound disasters” due to slope destabilization, deforestation, and aggressive land modification.
5. **Climate change** is accelerating glacier retreat; IISc and State Climate Outlook show faster melt rates compared to global averages.
6. Glacial lake outburst floods (e.g., **South Lhonak, 2023**) show how infrastructure along river valleys amplifies destruction.

7. Displacement due to hydropower, mining, and highways has weakened traditional livelihoods while offering little long-term resilience.
8. Experts recommend a “**mountain logic**” development model—respecting carrying capacity, prioritizing eco-tourism, watershed protection, and community governance.

AFRICA’S CLIMATE RESILIENCE: HOMEGROWN SOLUTIONS

Recent Update: WMO’s 2024 report shows unprecedented warming and disaster frequency across Africa.

About:

1. Sub-Saharan Africa contributes **1.9%** of global cumulative emissions but remains one of the most climate-vulnerable regions.
2. Seven of the ten most climate-vulnerable countries are in Africa, per the **Brookings Index**.
3. African temperatures have risen faster than global averages over the past 60 years, with 2024 among the warmest recorded.
4. Climate shocks threaten agriculture, infrastructure, and food security, intensifying migration and poverty risks.
5. Africa requires **US \$2.8 trillion** (2020–2030) for NDC implementation, but current finance is far below needs.
6. High debt servicing (30% of revenues in 2025) limits adaptation spending and increases reliance on external loans.
7. Countries are adopting hybrid resilience models—**indigenous knowledge + modern technologies**, drought-resistant crops, and reforestation.
8. Africa’s approach offers a template for Global South climate justice and inclusive adaptation.

CIVIL SOCIETY AND THE CLIMATE IMPERATIVE: GLOBAL SOUTH UNITY

Recent Update: Post-COP28 and COP29 negotiations showed weakening Global South cohesion, prompting renewed calls for unity.

About:

1. Global South solidarity has historically shaped major outcomes—Bandung (1955), Rio (1992), COP27 (Loss and Damage Fund).
2. Fragmentation today stems from geopolitical pressures, unequal finance, and divergent energy pathways.

3. BRICS+ nations now represent **48% of global population** and lead in renewable capacity additions.
4. BRICS produces **51% of global solar power**, reflecting a major South-driven energy transition.
5. The 2025 BRICS Declaration calls for **polyalignment**, green industrial policy, and equitable climate finance.
6. Civil society plays a crucial role in maintaining accountability, highlighting shared challenges, and shaping just-transition narratives.
7. Youth and environmental movements are redefining leadership beyond state-centric diplomacy.
8. Strengthened Global South collaboration is essential for climate justice, technology access, and debt reforms.

NATIONAL BIODIVERSITY AUTHORITY (NBA) & BENEFIT SHARING

Recent Update: RTI data show NBA disbursed **only 27%** of collected ABS funds since 2008.

About:

1. NBA was created under the **Biological Diversity Act, 2002** to ensure **fair benefit sharing**.
2. It collected **₹224.28 crore**, but only **₹60.44 crore** reached communities.
3. 95% of Access and Benefit Sharing payments must go to **local communities**, but tracing beneficiaries is difficult.
4. Major contribution (**₹100 crore**) comes from trade in **red sanders** of Andhra Pradesh.
5. Funds remain stuck in **fixed deposits**, leading companies to demand interest sharing.
6. Weak documentation and poor coordination hinder disbursement.
7. Beneficiary identification is complex due to **multi-region sourcing**.
8. Reforms needed: **traceability systems**, transparent databases, and stronger BMC participation.

CLIMATE CHANGE & HIMALAYAN WILDLIFE

Recent Update: CMS warns Himalayan species are moving to **higher altitudes** due to warming.

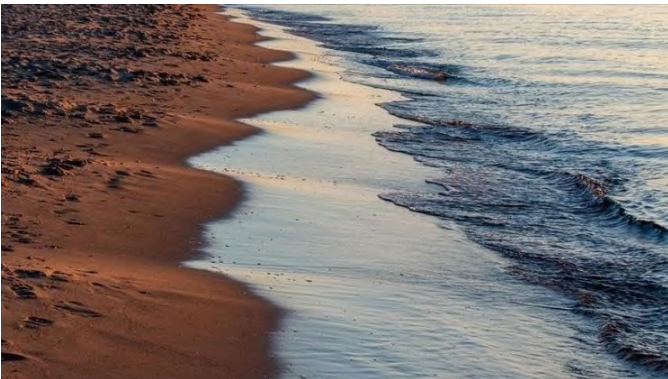


About:

1. Warming affects **breeding, foraging, and migration** of musk deer, pheasants, and snow trout.
2. Unpredictable rainfall and shorter winters disrupt **ecosystem timing**.
3. Human pressures—tourism, roads, hydropower—fragment habitats.
4. CMS (Bonn Convention) protects migratory species via Appendix I & II listings.
5. Key agreements (AEWA, ASCOBANS) guide international cooperation.
6. Himalayan species face shrinking habitats and **range-shift limits**.
7. Transboundary conservation corridors are urgently needed.
8. Climate-resilient wildlife policies must be incorporated into national strategies.

NEW ZEALAND'S OCEANS WARMING FASTER THAN GLOBAL AVERAGE

Recent Update: NZ seas warming **34% faster** than global oceans, per its environment ministry.



About:

1. Rising sea temperatures threaten **NZ \$80 billion** worth of coastal housing.
2. Sea-level rise increases **storm surges** and coastal flooding frequency.
3. Indigenous marine species face **habitat loss** and migration disruptions.
4. Warmer oceans intensify **extreme weather** events.

5. Economic impact includes infrastructure damage and insurance losses.
6. Fisheries and tourism face long-term risks.
7. Coastal planning must integrate **climate-risk models**.
8. NZ calls for global cooperation on **marine protection**.

GREAT GREEN WALL: AMBITION VS REALITY

Recent Update: Satellite data show **minimal vegetation gains** despite 15+ years of GGW implementation.



About:

1. GGW aimed to restore **100 million ha** across the Sahel by 2030.
2. Senegal shows growth in **only 1 of 36** monitored sites.
3. Harsh climate and inadequate irrigation cause **high tree mortality**.
4. Funding gaps limit long-term restoration.
5. Overgrazing and poor soil hinder sapling survival.
6. Many international pledges remain **undelivered**.
7. Experts call for **agroforestry**, drought-resistant species, and community leadership.
8. GGW needs better monitoring, finance, and climate-adaptive methods.

SUKAPAIKA RIVER RESTORATION (ODISHA)

Recent Update: 425 villages collaborate to revive the **Sukapaika**, a dried Mahanadi distributary.

About:

1. Sukapaika was cut off due to a 1950s barrage near **Naraj**, leading to ecological decline.
2. The river's flow lost connection with the Mahanadi, drying wetlands and farmlands.
3. Local mobilisation led by a doctor initiated restoration demands.
4. NRC and CPCB guidelines now recognise it as a **priority degraded river stretch**.
5. Revival aims to restore fisheries, irrigation, and groundwater recharge.
6. Embankments and siltation remain major barriers.

- Community-based management is central to revival plans.
- Restoration may become a **national model** for distributary revival.

BARREN ISLAND VOLCANO ERUPTION

Recent Update: India's only active volcano erupts following a **M4.2 earthquake** in the Andaman Sea.



About:

- Barren Island's first eruption traced to **1787**; it reactivated in 1991 after 159 years.
- Subsequent eruptions recorded in **1994–95, 2005–07, 2010, 2013–14, 2017, 2022**.
- Located in the **Indian subduction zone**, marking Indo-Australian Plate descent.
- Island is uninhabited, with steep ash slopes and a central crater lake.
- Eruptions offer insight into **plate tectonics** and magma processes.
- Scientists study whether climate change influences volcanic activity.
- Some hypotheses link **ice-melt pressure loss** to increased eruptions.
- Volcanic aerosols are known to **temporarily cool** global temperatures.

SOURCE: DRISHTI MONTHLY

ORCAS (KILLER WHALES)

Recent Update: Appeared in marine biodiversity studies related to climate impacts.



About:

- Also called **Killer Whales**, the largest members of the **Delphinidae (dolphin) family**.
- Found in all oceans, with high populations in **Antarctica, Norway & Alaska**.
- IUCN Status: Data Deficient** due to limited global population data.
- Live in complex social units called **pods**, usually matrilineal.
- Highly intelligent hunters practicing coordinated predation.
- Feed on fish, seals, sharks, and sometimes whales.
- Play a key role as **apex predators** maintaining marine ecological balance.

PAINTED STORKS

Recent Update: Painted stork sightings declined in several southern states, prompting renewed conservation focus.



About:

- Painted Stork (Mycteria leucocephala)** is a **large wading bird** native to the **Indian subcontinent**.
- Distributed across **India, Sri Lanka, Pakistan, Myanmar, Malaysia, Thailand, Vietnam**.
- IUCN Status: Near Threatened** (verify before exam; some sources list as Least Concern).
- They are **non-migratory** and move locally between wetlands.
- Common habitats: **Kolleru Lake (AP), Keoladeo National Park (Rajasthan), Karnataka's wetlands**; very rare in **Kerala**.
- Both sexes appear similar — **no sexual dimorphism**.
- They feed mainly on **fish**, contributing to wetland ecological balance.

VULTURE CONSERVATION PORTAL

Recent Update: "We Foundation India" launched **India's first vulture conservation portal**.



About:

1. India hosts **9 vulture species**, including **White-rumped, Indian, and Slender-billed vultures** (all Critically Endangered).
2. Vultures are key **scavengers** preventing spread of diseases.
3. Major threat: **diclofenac toxicity**; replaced by **meloxicam**.
4. Conservation breeding centres: **Pinjore (Haryana)** and **Rani (Assam)**.
5. Guided by **Action Plan for Vulture Conservation 2020–2025**.
6. Portal improves **tracking, research, and reporting** on vulture sightings and threats.
7. Supports **community awareness** and ecological monitoring.

LEMONGRASS

Recent Update: CSIR's **Aroma Mission** expanded cultivation of lemongrass for rural income generation.



About:

1. Scientifically known as **Cymbopogon**, native to **tropical Asia**.
2. Grown widely in **Kerala, Karnataka, Maharashtra, Tamil Nadu, West Bengal**.
3. Prefers **warm, humid climates** with **well-drained sandy/loamy soil**.
4. Contains **citronella**, a natural **mosquito repellent**.

5. Used for managing **digestive issues, stress, insomnia**.
6. Essential oil used in **perfumes, soaps, repellents, aromatherapy**.
7. India is one of the **largest producers and exporters**; China also leads global production.
8. Promoted under **CSIR Aroma Mission (2016)** for high-value crop diversification.

HILSA FISH (ILISH)

Recent Update: New conservation measures announced to manage **Hilsa population** in the Ganga delta.



About:

1. Belongs to the **Clupeidae family**, same as herrings.
2. Found in **Bangladesh, India, Pakistan, Myanmar, Persian Gulf**.
3. An **anadromous species** — lives in oceans but migrates upriver to spawn.
4. Bangladesh produces **70% of global Hilsa**; it is the country's **national fish**.
5. In India, found mainly in **Ganga and Godavari** river systems.
6. Valued for cultural significance in **Bengal cuisine and rituals**.
7. **IUCN Status:** Least Concern.
8. A lunar crater is named "**Hilsa**" after the town in Bihar.

HIMALAYAN BROWN BEAR

Recent Update: Recent surveys in Ladakh recorded **declining sightings**, raising conservation concerns.

About:

1. Also called **Isabelline Bear** or **Himalayan Red Bear**; called **Denmo** in Ladakhi.
2. Largest mammal in the **high-altitude Himalayas**.
3. Found in **India, Pakistan, Nepal, China (Tibet), Bhutan**.
4. In India: present in **J&K, Himachal Pradesh, Uttarakhand** in fragmented alpine habitats.
5. **IUCN: Critically Endangered, WPA Schedule I, CITES Appendix I**.
6. Shows marked **sexual dimorphism** — males larger than females.
7. Threats: **habitat loss, climate change, human–wildlife conflict**.

RED IVY PLANT (*Strobilanthes alternata*)

Recent Update: India developed **first multifunctional wound-healing nanofiber pad** inspired by Red Ivy.



About:

1. Belongs to **Acanthaceae** family; prevalent in tropical regions.
2. Known as **murikooti pacha**.
3. Traditionally used in **folk medicine** for treating wounds.
4. Researchers isolated **acteoside**, a key bioactive compound.
5. Acteoside shows high **wound-healing efficacy** at 0.2%.
6. Basis for **nanomaterial-based medical pads**.
7. Demonstrates India's advancement in **bio-pharmaceutical innovation**.

BIODIVERSITY HERITAGE SITE (BHS)

Recent Update: India now has **49 BHS** (as of May 2025).

About:

1. Designated under **Section 37 of Biological Diversity Act, 2002**.



2. Includes **sacred groves, wetlands, community-conserved areas**.
3. Notified by **State Governments** in consultation with local bodies.
4. Managed by **Biodiversity Management Committees (BMCs)**.
5. Advised by **National Biodiversity Authority (NBA)**.
6. No major restrictions on **traditional community practices**.
7. First BHS: **Nallur Tamarind Grove, Bengaluru (2007)**.

GARRA NAMBASHIENSIS

Recent Update: A new freshwater fish species **Garra nambashiensis** was discovered in Manipur.



About:

1. Newly identified species from **Taretlok**, a Chindwin River tributary.
2. Belongs to genus **Garra**, known for bottom-feeding fish.
3. Found in **hill streams** of Northeast India.
4. Indicates rich **aquatic biodiversity** of Manipur.
5. Adapted to **fast-flowing freshwater ecosystems**.
6. Helps understand **evolution and biogeography** of the region's fish fauna.
7. Important for **conservation mapping**.
8. Adds to India's expanding list of **endemic freshwater species**.

SOURCE: INSIGHTS MONTHLY

SAUNDERS'S TERN

Recent Update: Coverage increased after sightings near Indian coasts.



About:

1. Small **marine ground-nesting bird** of family **Laridae**.
2. Distributed along **north-western Indian Ocean shores**.
3. Breeds from **Red Sea & Persian Gulf** to islands near India/Sri Lanka.
4. Winters in **Seychelles, Maldives, Cocos Islands**.
5. IUCN Status: **Least Concern**.
6. Recognisable for its **slender bill** and agile coastal flight.
7. Important for **coastal biodiversity** indicators.
8. Note: **Caspian Tern** is the largest tern species.

ADYAR ESTUARY

Recent Update: Recently highlighted in ecological assessments of Chennai.

About:

1. Formed where **Adyar River meets Bay of Bengal**.
2. Located in **Chennai**, between Santhome and Elliot's Beach.
3. Important **urban estuarine ecosystem**.
4. Supports migratory birds and **brackish-water biodiversity**.
5. Acts as natural **flood buffer**.
6. Vulnerable to pollution and encroachment.
7. Key site for **Chennai Coastal Restoration Projects**.
8. Critical for environmental conservation in Tamil Nadu.

RED-NECKED PHALAROPE

Recent Update: First recorded sighting in **Nanjarayan Bird Sanctuary (TN)**.

About:

1. Small **shorebird** known for spinning on water to feed.
2. Distribution: **Circumpolar**, tundra regions (60°–70° latitudes).
3. IUCN: **Least Concern**.



4. Exhibits unique **gender role reversal** (females brighter).
5. Migrates long distances across oceans.
6. Prefers **boreal wetlands & Arctic ponds**.
7. Diet includes aquatic **invertebrates & larvae**.
8. Noted for **rapid circular swimming behaviour**.

STRIPED DOLPHIN

Recent Update: A large pod spotted off **Visakhapatnam coast**.



About:

1. Found in **temperate & tropical waters worldwide**.
2. Prefers **deep offshore waters**, especially upwelling zones.
3. IUCN: **Least Concern**.
4. Known for **acrobatics** like breaching & roto-tailing.
5. Lives in pods of **25–100**.
6. Lifespan up to **58 years**.
7. Distinctive **dark stripes** from eye to flank.
8. Threats include **bycatch & ocean pollution**.

PAPIKONDA NATIONAL PARK

Recent Update: Study recorded **51 herpetofauna species**.

About:

1. Located in **Andhra Pradesh**, along **Godavari River**.
2. Part of **Eastern Ghats**; rich mountainous terrain.
3. Contains peaks like **Devara Konda & Verala Konda**.
4. Notified as **Important Bird & Biodiversity Area (IBA)**.
5. Home to **Konda Reddy tribe (PVTG)**.

- Vegetation: **moist deciduous, semi-evergreen, dry deciduous.**
- Known for unique **Kanchu Mekha dwarf goat.**
- Now planned as an **AI-enabled nature experience zone.**

IRIDOGORGIA CHEWBACCA

Recent Update: Newly discovered **deep-sea coral species** in the western Pacific.



About:

- Belongs to the genus **Iridogorgia.**
- Notable for **long, spiralling structures** resembling "Chewbacca."
- Found in **deep-sea habitats** with low light.
- Plays an ecological role by supporting **deep-sea biodiversity.**
- Discovered through **remote-operated underwater expeditions.**
- Highlights rich **unexplored marine ecosystems.**
- Offers insights into **coral evolution in deep waters.**
- Important for studying **climate change effects on deep oceans.**

LACTIFLUUS KHASIANUS

Recent Update: Newly identified as an **edible mushroom species** in Meghalaya.

About:

- Locally known as "**Tit iongnah**".
- Found in **Kudremukh range** of the Western Ghats.
- Grows symbiotically with **Khasi pine (Pinus kesiya).**
- Fifth known species of its section in India.
- First confirmed **edible species** of this group.
- Utilised traditionally by **Khasi tribal communities.**
- Enhances understanding of **fungal diversity.**
- Important for **ethnobotanical studies.**

UDAIPUR JHEEL

Recent Update: Received the **Ramsar tag** in September 2025.



About:

- Located in **Champan, Bihar**, adjoining the **Udaipur Wildlife Sanctuary.**
- Serves as an important wintering habitat for the **Common Pochard (IUCN: Vulnerable).**
- Hosts **Alysicarpus roxburghianus**, an herb **endemic to India.**
- Supports diverse wetland biodiversity and migratory birds.
- Vital for local ecological balance and hydrological functions.
- Enhances Bihar's network of protected **Ramsar wetlands.**
- Functions as a climate buffer and supports groundwater recharge.
- Plays a role in regional eco-tourism and conservation awareness.

YELLOW-TAILED ASHY SKIMMER

Recent Update: Recorded for the **first time in Yamuna Biodiversity Park, Delhi.**



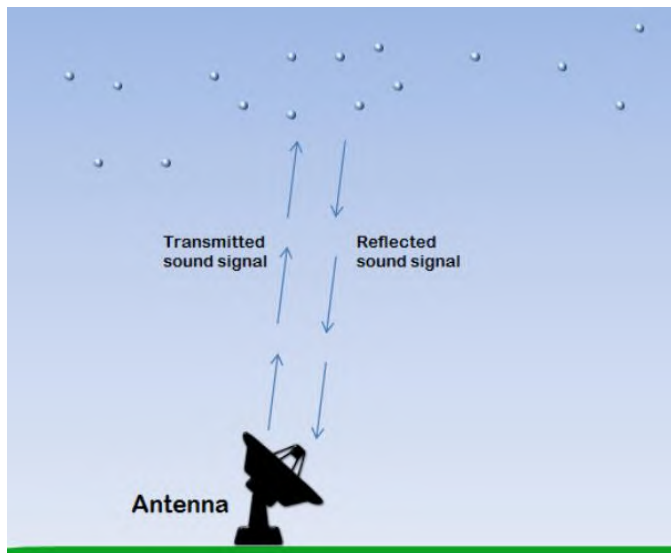
About:

- Dragonfly species from family **Libellulidae.**
- Also known as **Common Chaser** or **Swampwatcher.**
- Widely distributed across **South Asia, Southeast Asia, and Oceania.**
- Countries include India, Indonesia, China, Australia, Vietnam.

5. Classified as **Least Concern** (IUCN).
6. Indicator of healthy freshwater ecosystems.
7. Prefers marshes, ponds, and slow-moving waters.
8. Recent sightings expand its known range in north India.

SODAR SYSTEM

Recent Update: Installed at **IMD Delhi** for enhanced atmospheric monitoring.



About:

1. **SODAR = Sound Detection and Ranging**, a ground-based remote sensing tool.
2. Measures vertical profiles of **wind speed** and **turbulence**.
3. Works by emitting sound pulses and analysing **reflected frequencies**.
4. Developed by **CSIR-AMPRI**, Bhopal.
5. Helps track **inversion layers**, fog height, and atmospheric stability.
6. Useful for pollution studies and boundary-layer research.
7. Operates up to several hundred metres above ground.
8. Aids aviation, meteorology, and climate modelling.

SWACHH SHEHAR JODI (SSJ)

Recent Update: Implemented under **Swachh Bharat Mission – Urban**.

About:

1. Launched by **MoHUA** to strengthen urban sanitation efforts.
2. Includes **72 mentor cities** and around **200 mentee cities**.
3. Focuses on exchange of **best practices** in waste management.
4. Promotes city-to-city knowledge transfer.



5. Encourages capacity building and institutional reforms.
6. Supports waste segregation, recycling, and circular economy.
7. Enhances performance under Swachh Bharat rankings.
8. Aims to create sustainable and cleaner urban ecosystems.

LACHIPORA WILDLIFE SANCTUARY

Recent Update: Reaffirmed as a key stronghold for **Markhor** and **Hangul** conservation.

About:

1. Located in **Jammu & Kashmir**, on the **northern bank of the Jhelum River**.
2. Created primarily to protect the **Markhor** (IUCN: Endangered).
3. Also home to the **Hangul** (Kashmir Stag, IUCN: Endangered).
4. Hosts **Western Tragopan** (IUCN: Vulnerable).
5. Recognised as an **Important Bird Area (IBA)**.
6. Vegetation includes **deodar**, **Himalayan white pine**, **blue pine**, and broadleaf forests.
7. Rich in Himalayan flora such as **birch**, **horse chestnut**, **Persian walnut**.
8. Critical habitat for alpine and temperate wildlife species.



TOPICS COVERED-

- 1. India Sets Legally Binding Emission-Cut Rules for Four Key Sectors**
- 2. Record Emissions and Renewable Energy Surges**
- 3. IUCN World Conservation Congress 2025**
- 4. Soil Security: Existential Challenge of Humanity**
- 5. India's Wild Elephant Population Falls by 18%**
- 6. Parbati-Kalisindh-Chambal (PKC) River Linking Project**
- 7. Himachal Pradesh's Plea for Forestland Rehabilitation**
- 8. Uttar Pradesh's Faecal Sludge Crisis**
- 9. Warm-Water Corals: First Ecosystem to Collapse**
- 10. Global Land Outlook: Restoring Ecological Connectivity**
- 11. UNFCCC COP30**
- 12. Climate Finance**
- 13. Urban Air Pollution**
- 14. India's Renewable Energy Growth**
- 15. Seed Management and Draft Seeds Bill, 2025**
- 16. Vultures in India**
- 17. India-Botswana Cheetah Translocation**
- 18. Supreme Court Directions on Tiger Reserves**
- 19. Ex-Post Facto Environmental Clearance**
- 20. Dumpsite Remediation Accelerator Programme**
- 21. Global Reporting Initiative**
- 22. Leadership Group for Industry Transition (LeadIT)**
- 23. UAE Consensus**
- 24. UNEP Adaptation Gap Report**
- 25. Emissions Gap Report 2025**
- 26. State of the Cryosphere Report**
- 27. Global Cooling Watch**
- 28. Climate Risk Index**
- 29. State of Food and Agriculture Report**
- 30. Montreal Protocol**
- 31. Minamata Convention**
- 32. Lake Turkana**
- 33. Unlocking India's Green Hydrogen Potential**
- 34. National Green Hydrogen Mission**
- 35. Adaptation Gap Report 2025**
- 36. Dugong Conservation**
- 37. Australia's Northern Forests Turning into Carbon Source**
- 38. Biosphere Reserves in India**
- 39. Tropical Forest Forever Facility (TFFF)**
- 40. Principle of Intergenerational Equity**
- 41. Climate Risk Index 2026**

42. Carbon Emissions and Global Trends
43. Long-Term Air Pollution Management
44. Global Methane Status Report 2025
45. Global Cooling Watch 2025 Report
46. Early Warning Systems in the Himalayas
47. India's Carbon Emissions Trends
48. Snow Leopard (*Panthera uncia*)
49. Painted Stork
50. Southern Right Whale
51. Chowna Buku Chulu (New Begonia Species)
52. Indian Wolf
53. Blackbuck
54. Indian Scops-Owl
55. Chrysanthemum
56. Kopi Luwak
57. Asola Bhatti Wildlife Sanctuary
58. Kali Tiger Reserve
59. Amchang Wildlife Sanctuary
60. Panna Tiger Reserve
61. Satkosia Tiger Reserve
62. Karakoram Wildlife Sanctuary
63. Hastinapur Wildlife Sanctuary
64. Eturnagaram Wildlife Sanctuary
65. Commission for Air Quality Management
66. National Environmental Engineering Research Institute
67. IUCN World Conservation Congress
68. Blue Flag Certification
69. Global Environment Facility

SOURCE: DOWN TO EARTH

INDIA SETS LEGALLY BINDING EMISSION-CUT RULES FOR FOUR KEY SECTORS

Recent Update: India notified the **Greenhouse Gas Emission Intensity (GEI) Target Rules, 2025**, its first **legally binding industrial climate regulation**.

About:

1. Introduces enforceable **emission-intensity reduction targets** for industries.
2. Covers **Aluminium, Cement, Chlor-alkali, and Pulp & Paper** sectors.
3. Applies to **282 industrial units** for **2025–26 and 2026–27**.
4. Focuses on reducing **emissions per unit of output**, not absolute caps.
5. Operationalises the **Carbon Credit Trading Scheme (CCTS), 2023**.
6. Over-performers earn **carbon credits**; under-performers must **purchase credits**.
7. Implemented under the **Energy Conservation Act, 2001 (amended 2022)** with BEE oversight.
8. Aligned with India's **NDC target of 45% reduction in GDP emission intensity by 2030 (2005 baseline)**.

RECORD EMISSIONS & RENEWABLE SURGES

Recent Update: **WMO** confirmed record atmospheric **CO₂ levels**, while renewables overtook coal globally.



About:

1. **Renewables became the world's top electricity source** in H1-2025 (Ember).
2. **Solar power doubled in three years**, led by China and India.

3. India crossed **90 GW solar capacity** under the **National Solar Mission**.
4. **Natural gas use rose** due to AI data centres and heatwaves.
5. Climate finance gap persists, limiting developing countries' transition capacity.

IUCN WORLD CONSERVATION CONGRESS 2025

Recent Update: Held in **Abu Dhabi**, shaping global biodiversity priorities.

About:

1. Nearly **one-third of Earth's land** heavily altered by humans.
2. **40% of land degraded**, affecting almost **half of humanity**.
3. **60% of global rivers** dammed or diverted.
4. **1,256 bird species globally threatened**; declining trends rising.
5. Arctic species uplisted due to **melting ice and prey loss**.
6. Indian grassland birds show **increasing conservation distress**.
7. Indian protected areas face **deforestation, tourism, and climate stress**.
8. **Tiger recovery** highlighted as a global conservation success model.

SOIL SECURITY: EXISTENTIAL CHALLENGE OF HUMANITY

Recent Update: Adoption of **IUCN Motion 007 – Soil Security Law**.

About:

1. First global legal recognition of **soil security**.
2. Defined through **capacity, condition, capital, and connectivity**.
3. Over **33% of global soils degraded**.
4. India loses **5.3 billion tonnes of soil annually**.
5. Soil underpins **12 of the 17 SDGs**.
6. Fills governance gap not covered by **UNFCCC, CBD, UNCCD**.

7. Builds on **Soil Health Cards, NMSA, PMKSY**.



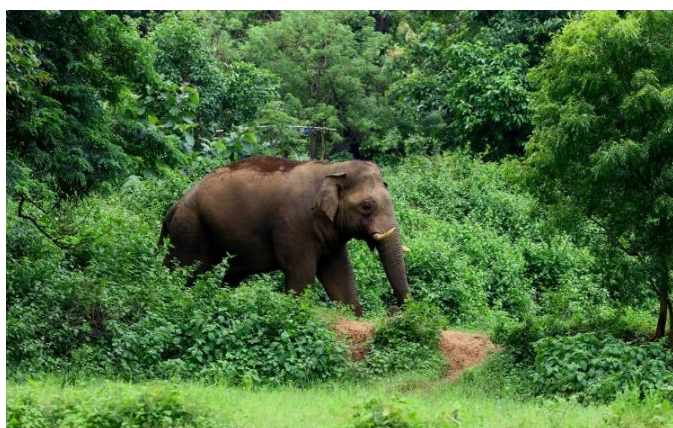
8. Push toward a future **Global Soil Convention**.

INDIA'S WILD ELEPHANT POPULATION FALLS BY 18%

Recent Update: India released its **first DNA-based elephant census**.

About:

1. Current estimate: **22,446 elephants**, down from **27,312 (2017)**.
2. **Karnataka** hosts the largest population.
3. Sharp decline in **Northeast and Eastern Himalayas**.

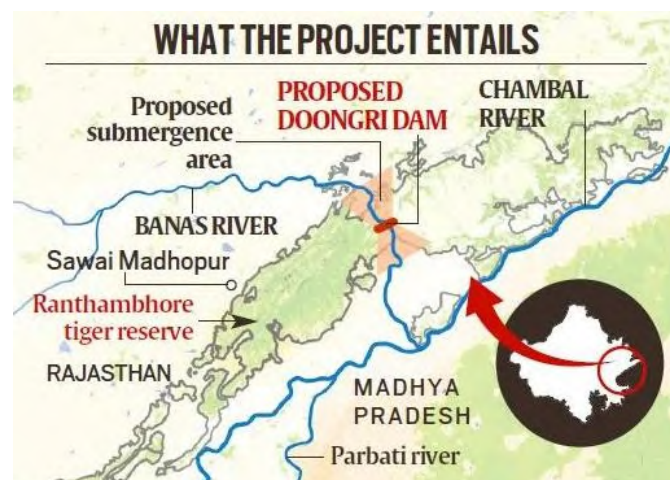


4. **Habitat fragmentation** is the primary cause.
5. Over **3,000 human and elephant deaths** from conflict (2018–23).
6. Corridor loss due to **infrastructure and encroachment**.
7. **Project Elephant** and **National Elephant Action Plan (2023–32)** key measures.

8. Emphasis on **landscape-level conservation and technology use**.

PARBATI–KALISINDH–CHAMBAL (PKC) RIVER LINKING PROJECT

Recent Update: NTCA raised ecological concerns due to proximity to Kuno National Park.



About:

1. Part of India's **National River Interlinking Plan**.
2. Transfers water to **drought-prone MP and Rajasthan**.
3. Involves **Patanpur, Mohanpura, and Kundaliya dams**.
4. Will irrigate **2.8 lakh hectares** and improve water security.
5. Risks **habitat fragmentation** near cheetah landscape.
6. May disrupt **corridor connectivity and prey base**.
7. Highlights trade-off between **water security and biodiversity**.

HIMACHAL'S PLEA FOR FORESTLAND REHABILITATION

Recent Update: State sought **temporary forestland diversion** post-climate disasters.

About:

1. Severe impacts from **cloudbursts and landslides**.
2. **68% of state area** legally classified as forest.
3. Climate change doubled **extreme rainfall events** since 2010.

- Over **1,500 villages** classified as climate-sensitive.
- Forest Conservation Act limits relocation options.
- Need for **temporary-use forest model** with safeguards.
- Emphasises **climate-resilient rehabilitation planning**.

UTTAR PRADESH'S FAECAL SLUDGE CRISIS

Recent Update: FSM flagged as a major environmental and public-health risk.

About:

- 75% households** rely on on-site sanitation.
- Less than **30% sludge safely treated**.
- Illegal dumping contaminates **groundwater and rivers**.
- Methane emissions add to **climate vulnerability**.
- Weak monitoring and poor infrastructure.
- Urgent need for **integrated FSM roadmap**.

WARM-WATER CORALS: FIRST ECOSYSTEM TO COLLAPSE

Recent Update: Global Tipping Points Report 2025 confirms collapse.



About:

- Fourth global bleaching affected **85% of reefs**.
- Coral collapse marks **first crossed ecological tipping point**.
- Great Barrier Reef** lost over **70% hard corals** in parts.
- Indian reefs in **Lakshadweep and Gulf of Mannar** severely impacted.
- Collapse threatens **fisheries, coastal protection, and livelihoods**.

- Cryopreservation and assisted evolution underway.
- India launched **Coral Restoration Initiative 2030**.
- Emission cuts remain the **only long-term solution**.

GLOBAL LAND OUTLOOK: RESTORING ECOLOGICAL CONNECTIVITY

Recent Update: Launched at IUCN World Conservation Congress.



About:

- Habitat fragmentation disrupting **migratory routes worldwide**.
- Threats seen in **Western Ghats and Aravallis**.
- Connectivity vital for **climate adaptation and biodiversity survival**.
- Recommends **rewilding and buffer zones**.
- India targets **26 million ha land restoration by 2030**.
- Aligns with **CAMPA and Green India Mission**.

SOURCE: VISION MONTHLY

UNFCCC COP30

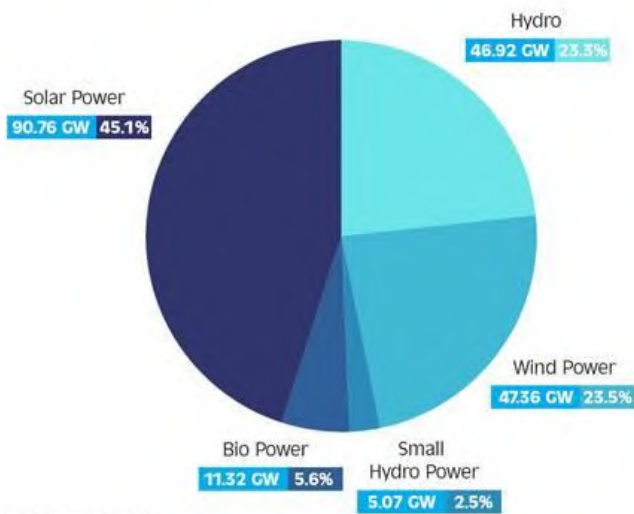
Recent Update: The 30th Conference of Parties (COP30) was held in **Belém, Brazil**, marking **10 years of the Paris Agreement**.

About:

- COP30 was projected as the **"COP of Implementation"**, shifting focus from mere climate pledges to **on-ground delivery and accountability**.



Renewable Energy Capacity in India



As of October 10, 2024

2. It was also called the “**Forest COP**”, highlighting the role of forests and nature-based solutions.
3. The summit coincided with submission of **updated Nationally Determined Contributions (NDC 3.0)**.
4. The **Belém Package** focused on adaptation, finance, just transition and technology transfer.
5. Strong emphasis was placed on **adaptation finance** for vulnerable countries.
6. Reinforced the principle of **Common but Differentiated Responsibilities (CBDR)**.
7. Despite geopolitical tensions, **195 Parties reaffirmed multilateral cooperation**.

CLIMATE FINANCE

Recent Update: Developing countries launched Country and Regional Climate Finance Platforms at COP30.

About:

1. Platforms aim to align national climate priorities with global financial flows.
2. Supported by the **Green Climate Fund (GCF)** under its Readiness Programme.
3. Designed to overcome fragmented and project-based climate financing.
4. Address the massive **\$1.3 trillion annual climate finance requirement**.
5. Highlight the gap between need and the **\$300 billion NCQG commitment**.

6. Emphasise public finance over excessive private-sector dependence.
7. Reaffirm equity and **CBDR principles** in climate finance.

URBAN AIR POLLUTION

Recent Update: CAQM implemented Stage-III GRAP across NCR.



About:

1. GRAP is a graded emergency response linked to AQI levels.
2. Activated during severe and very poor air quality episodes.
3. Major sources include vehicles, industries, construction dust and waste burning.
4. Meteorological factors like inversion and low wind speed worsen pollution.
5. Urban design issues such as street canyons trap pollutants.
6. Transboundary pollution from stubble burning aggravates the crisis.
7. Highlights the need for integrated air quality governance.

INDIA'S RENEWABLE ENERGY GROWTH

Recent Update: India crossed 50% non-fossil electricity capacity in 2025.

About:

1. Renewable energy includes solar, wind, hydro, bioenergy and geothermal sources.
2. India achieved its NDC renewable target five years early.
3. Installed non-fossil capacity reached 256 GW.

4. India ranks fourth globally in renewable capacity.
5. Solar energy expanded nearly 40-fold since 2014.
6. Ethanol blending reached 20%, strengthening energy security.
7. Supports energy transition and climate commitments.

SEED MANAGEMENT (DRAFT SEEDS BILL, 2025)

Recent Update: Government released Draft Seeds Bill to modernise seed regulation.

About:

1. Replaces the Seeds Act, 1966 with a modern regulatory framework.
2. Introduces mandatory registration of seed varieties.
3. Establishes Central and State Seed Committees.
4. Implements the SATHI digital seed traceability portal.
5. Protects farmers' rights to save, exchange and use seeds.



6. Ensures quality standards and certification.
7. Strengthens transparency in the seed market.

VULTURES

Recent Update: Wildlife Institute of India released the first national vulture assessment.



About:

1. Assessment covered critically endangered vulture species.
2. Found sharp contraction of breeding habitats.
3. Majority of nests located inside protected areas.
4. Diclofenac poisoning remains a major threat.
5. Species show low reproductive rates and habitat specificity.
6. Emphasises need for safe food zones and habitat protection.
7. Highlights vultures' ecological role as natural scavengers.

INDIA-BOTSWANA CHEETAH TRANSLOCATION

Recent Update: Botswana agreed to transfer eight cheetahs to India.

About:

1. Part of Project Cheetah to reintroduce extinct species.
2. Implemented by the National Tiger Conservation Authority.
3. Enhances biodiversity and grassland restoration.
4. Promotes international conservation cooperation.
5. Aims to establish a viable cheetah meta-population.
6. Supports ecosystem balance and tourism.
7. Reflects India's leadership in wildlife conservation.

SUPREME COURT DIRECTIONS ON TIGER RESERVES

Recent Update: Supreme Court issued directives to strengthen tiger conservation.

About:

1. Banned tourism in core tiger habitats.
2. Restricted mining and commercial activity in buffer zones.
3. Mandated notification of Eco-Sensitive Zones.
4. Introduced uniform compensation for human–wildlife conflict.
5. Directed preparation of updated Tiger Conservation Plans.
6. Strengthened protection of wildlife corridors.
7. Reinforced Wildlife Protection Act implementation.

EX-POST FACTO ENVIRONMENTAL CLEARANCE

Recent Update: Supreme Court recalled earlier ban on post-facto clearances.

About:

1. Allowed conditional regularisation of past violations.
2. Recognised practical challenges in demolishing completed projects.
3. Balanced environmental protection with economic realities.
4. Reaffirmed prior environmental clearance as the norm.
5. Imposed penalties to deter future violations.
6. Prevented large-scale infrastructure disruption.
7. Reinforced sustainable development principles.

DUMPSITE REMEDIATION ACCELERATOR PROGRAMME

Recent Update: Launched under Swachh Bharat Mission–Urban 2.0.



About:

1. Targets remediation of 8.8 crore tonnes of legacy waste.
2. Uses biomining and biocapping technologies.
3. Converts dumpsites into usable land.
4. Reduces methane emissions and leachate risks.
5. Improves urban environmental health.
6. Supports circular economy principles.
7. Strengthens municipal waste governance.

SOURCE: INSIGHTS MONTHLY

GLOBAL REPORTING INITIATIVE

Recent Update: GRI launched the “Integrity Matters” framework.



About:

1. Global standard for sustainability reporting.
2. Enhances corporate transparency and accountability.
3. Aligns ESG reporting with global climate goals.
4. Promotes comparability and data reliability.
5. Guides responsible investment decisions.
6. Strengthens corporate climate governance.
7. Encourages sustainable business practices.

LEADERSHIP GROUP FOR INDUSTRY TRANSITION (LEADIT)

Recent Update: India addressed LeadIT forum at COP30.

About:

1. Joint initiative of India and Sweden.
2. Targets decarbonisation of heavy industries.

3. Encourages public–private collaboration.



4. Supports green technology adoption.
5. Facilitates knowledge and finance sharing.
6. Promotes just industrial transition.
7. Accelerates net-zero pathways.

UAE CONSENSUS

Recent Update: Adopted at COP28 in Dubai.

About:

1. Represents the first Global Stocktake outcome.
2. Calls for transition away from fossil fuels.
3. Strengthens renewable energy commitments.
4. Enhances adaptation finance.
5. Reaffirms 1.5°C temperature goal.
6. Supports climate equity principles.
7. Guides future climate negotiations.

UNEP ADAPTATION GAP REPORT

Recent Update: Latest report highlights widening adaptation gap.

About:

1. Global adaptation finance remains inadequate.
2. Developing countries face highest vulnerability.
3. Infrastructure and livelihoods at increasing risk.
4. Calls for urgent scaling of adaptation funding.
5. Emphasises local resilience planning.
6. Highlights unequal climate impacts.
7. Urges immediate global action.



EMISSION GAP REPORT 2025

Recent Update: UNEP released the 2025 Emissions Gap Report.

About:

1. Current pledges lead to 2.5°C warming.
2. Global emissions continue to rise.
3. India's per capita emissions remain low.
4. Urges faster decarbonisation pathways.
5. Highlights narrowing carbon budget.
6. Calls for accelerated mitigation.
7. Warns of irreversible climate risks.

STATE OF THE CRYOSPHERE REPORT

Recent Update: Released by the International Cryosphere Climate Initiative.

About:

1. Ice sheets melting at accelerating rates.
2. Rising sea levels threaten coastal regions.
3. Glacier retreat affects water security.
4. Permafrost thaw releases greenhouse gases.
5. Disrupts global climate systems.
6. Endangers ecosystems and livelihoods.
7. Demands urgent climate action.

GLOBAL COOLING WATCH

Recent Update: Released by UNEP's Cool Coalition.

About:

1. Global cooling demand projected to triple by 2050.
2. Rising heat stress increases cooling needs.
3. Promotes passive cooling solutions.
4. Encourages low-GWP refrigerants.
5. Integrates cooling with urban planning.
6. Supports equitable access to cooling.
7. Aligns cooling with climate goals.

CLIMATE RISK INDEX

Recent Update: Germanwatch released Climate Risk Index 2026.

About:

1. Ranks countries by exposure to extreme weather.
2. India among the most affected nations.
3. Highlights rising economic and human losses.
4. Emphasises preparedness and resilience.
5. Supports climate risk-informed planning.
6. Tracks long-term climate vulnerability.
7. Strengthens global accountability.

STATE OF FOOD AND AGRICULTURE REPORT

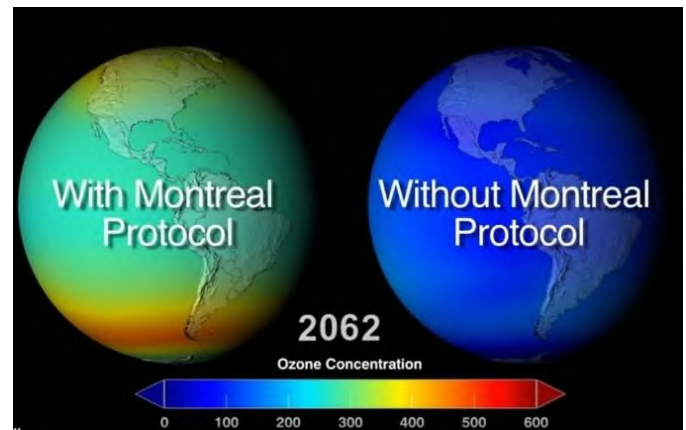
Recent Update: FAO released SOFA 2025.

About:

1. Highlights widespread land degradation.
2. Links soil loss with food insecurity.
3. Shows declining agricultural productivity.
4. Emphasises sustainable land management.
5. Addresses nutrition and livelihood risks.
6. Promotes ecosystem-based agriculture.
7. Supports long-term food security.

MONTREAL PROTOCOL

Recent Update: Parties met at MOP-37.



About:

1. Global treaty protecting the ozone layer.
2. Phased out ozone-depleting substances.
3. Kigali Amendment targets HFCs.
4. Contributes to climate mitigation.
5. Supports technology transfer.
6. Demonstrates effective global cooperation.
7. Delivers long-term environmental benefits.

MINAMATA CONVENTION

Recent Update: COP-6 advanced mercury control measures.

About:

1. Regulates mercury use and emissions.
2. Protects human health and ecosystems.
3. Targets mercury in products and processes.
4. Reduces bioaccumulation in food chains.
5. Strengthens international cooperation.
6. Promotes safer alternatives.
7. Advances global chemical safety.

LAKE TURKANA

Recent Update: Studies link falling water levels to seismic activity.

About:

1. World's largest desert lake located in East Africa.
2. Fed mainly by the Omo River.

3. Climate change reducing inflows.



4. Falling water levels increase tectonic stress.
5. Threatens local livelihoods and biodiversity.
6. UNESCO World Heritage Site.
7. Demonstrates climate–geological linkages.

SOURCE: DRISHTI MONTHLY

UNLOCKING INDIA'S GREEN HYDROGEN POTENTIAL

Recent Update: India commissioned its first port-based Green Hydrogen Pilot Project at V.O. Chidambaranar Port, Tamil Nadu, and declared three Green Hydrogen Hubs at Deendayal, Paradip and V.O. Chidambaranar ports.



About:

1. India aims to produce **5 MMT of green hydrogen by 2030** as part of its clean energy transition.
2. The initiative targets **₹8 lakh crore in investments** and creation of **6 lakh green jobs**.
3. Green hydrogen is defined as hydrogen produced with lifecycle emissions below **2 kg CO₂ per kg of hydrogen**.

4. The mission seeks to reduce fossil fuel imports worth **₹1 lakh crore annually**.
5. It supports decarbonisation of hard-to-abate sectors such as steel, fertilisers, and refining.
6. The programme aligns with India's **Atmanirbhar Bharat** and net-zero ambitions.
7. It positions India as a global hub for green hydrogen production and export.

NATIONAL GREEN HYDROGEN MISSION

Recent Update: Launched in January 2023 with an outlay of ₹19,744 crore.

About:

1. Aims to make India a global hub for production, use, and export of green hydrogen.
2. Focuses on energy security and reduced dependence on fossil fuel imports.
3. Supports domestic manufacturing of electrolyzers and associated technologies.
4. Encourages industrial decarbonisation in steel, fertilisers, and refining sectors.
5. Promotes job creation in clean energy value chains.
6. Supports innovation, R&D, and pilot-scale hydrogen projects.
7. Strengthens India's leadership in global climate action.

ADAPTATION GAP REPORT 2025

Recent Update: UNEP reported widening adaptation gaps despite rising climate risks.

About:

1. Developing countries need **USD 310–365 billion annually** for climate adaptation by 2035.
2. Current adaptation finance stands at only **USD 26 billion**, creating a massive funding gap.
3. The gap is driven by intensifying climate extremes and rising implementation costs.
4. The Glasgow target of doubling adaptation finance by 2025 is likely to be missed.
5. Adaptation funding remains skewed toward loans rather than grants.

6. Emphasises need for climate-resilient infrastructure and early warning systems.
7. Calls for scaling public finance and private sector participation.

DUGONG CONSERVATION

Recent Update: IUCN highlighted increasing threats to India's dugong population.

About:

1. Dugongs are large marine mammals dependent on seagrass ecosystems.
2. They have slow reproductive rates, making populations highly vulnerable.
3. India's dugongs are mainly found in the Gulf of Mannar, Palk Bay, and Andaman region.
4. Threats include habitat degradation, fishing bycatch, and coastal development.
5. Dugongs are listed under Schedule I of the Wildlife Protection Act.
6. They act as ecosystem engineers by maintaining healthy seagrass meadows.
7. Conservation efforts include habitat protection and community participation.

AUSTRALIA'S NORTHERN FORESTS TURNING INTO CARBON SOURCE

Recent Update: Research shows northeastern Australian forests have shifted from carbon sinks to carbon sources.



About:

1. Rising temperatures and frequent cyclones are increasing tree mortality.



2. Forests are losing their ability to absorb carbon dioxide.
3. Droughts and heat stress reduce biomass regeneration.
4. This weakens global carbon sequestration capacity.
5. Highlights vulnerability of tropical ecosystems to climate change.
6. Demonstrates feedback loops accelerating global warming.
7. Stresses urgency of forest protection policies.

BIOSPHERE RESERVES IN INDIA

Recent Update: India observed International Day for Biosphere Reserves to highlight conservation efforts.

About:

1. Biosphere reserves promote harmony between humans and nature.
2. They integrate conservation, sustainable development, and research.
3. India has 18 Biosphere Reserves under UNESCO's Man and Biosphere Programme.
4. Community participation is central to their management.
5. Promote livelihood diversification through eco-tourism and NTFPs.
6. Act as living laboratories for sustainable development.
7. Strengthen India's biodiversity conservation framework.

TROPICAL FOREST FOREVER FACILITY (TFFF)

Recent Update: India joined the Brazil-led TFFF initiative at COP30.

About:

1. TFFF aims to mobilise USD 125 billion to conserve tropical forests.
2. It provides long-term financial incentives to forest-rich countries.
3. Payments are based on verified forest conservation performance.
4. Combines public and private capital for sustainability.
5. Encourages forest protection over land conversion.
6. Recognises forests as global public goods.
7. Strengthens climate finance architecture for developing nations.

PRINCIPLE OF INTERGENERATIONAL EQUITY

Recent Update: Reaffirmed by Indian courts in environmental jurisprudence.



About:

1. Recognises the right of future generations to a healthy environment.
2. Treats natural resources as a shared inheritance.
3. Embedded in international environmental treaties.
4. Influences environmental impact assessments and policy design.
5. Highlights moral responsibility of present generations.
6. Courts note its limits in protecting critically endangered species.
7. Forms a foundational principle of sustainable development.

CLIMATE RISK INDEX 2026

Recent Update: India ranked among the most climate-vulnerable countries.

About:

1. CRI assesses impacts of extreme weather events globally.
2. India experienced frequent floods, heatwaves, and cyclones.
3. Economic and human losses remain significant.
4. Long-term exposure increases developmental vulnerability.
5. Highlights need for climate-resilient infrastructure.
6. Supports evidence-based adaptation planning.
7. Underscores urgency of global climate action.

CARBON EMISSIONS AND GLOBAL TRENDS

Recent Update: Global Carbon Project reported slowing growth in India's emissions.

About:

1. India's emissions rose modestly to 3.22 billion tonnes in 2025.
2. Per capita emissions remain far below global averages.
3. Emissions growth has slowed due to renewable expansion.
4. Coal remains dominant but cleaner technologies are expanding.
5. India ranks third in total emissions globally.
6. Highlights need for balanced development pathways.
7. Reinforces role of clean energy transition.

LONG-TERM AIR POLLUTION MANAGEMENT

Recent Update: Supreme Court emphasized long-term pollution control over short-term GRAP measures.

About:

1. GRAP offers short-term emergency responses to high pollution.
2. It does not address structural causes of air pollution.

3. Construction bans and vehicle restrictions hurt livelihoods.
4. Regional coordination remains weak.
5. China's long-term air quality reforms offer lessons.
6. Structural reforms in energy, transport, and industry needed.
7. Sustainable urban planning is essential for lasting air quality improvement.

SOURCE: INDIAN EXPRESS

GLOBAL METHANE STATUS REPORT 2025

Recent Update: The **UNEP** released the *Global Methane Status Report 2025* assessing progress under the **Global Methane Pledge**.



About:

1. The report notes that although methane growth has slowed, **current commitments are insufficient** to meet the **30% reduction target by 2030**.
2. Under the **Current Legislation Emissions (CLE)** scenario, emissions will reach **369 Mt in 2030**, only **4% lower** than 2021 levels.
3. Even full implementation of **NDCs and Methane Action Plans** would reduce emissions by only **8%**, far below required levels.
4. **Maximum Technically Feasible Reduction (MTFR)** could cut emissions by **32%**, avoiding **0.2°C of warming** by 2050.

5. Over **80% of methane reductions** can be achieved at **low or negative cost**, mainly in the **energy and waste sectors**.
6. Methane mitigation delivers rapid climate benefits and major **public health gains**.
7. The report stresses urgent global coordination to bridge the ambition gap.

GLOBAL COOLING WATCH 2025 REPORT

Recent Update: UNEP released the *Global Cooling Watch 2025* at COP30.

About:

1. Global cooling demand may **triple by 2050**, driven by urbanisation and heat stress.
2. Cooling-related emissions could reach **10.5 Gt CO₂e**, offsetting climate gains.
3. Electricity demand for cooling may rise from **5,000 TWh to 18,000 TWh**.
4. Over **2 billion people** lack access to affordable cooling.
5. **Passive cooling solutions** can reduce indoor temperatures by up to **8°C**.
6. Transition to **low-GWP refrigerants** could avoid **0.4°C warming**.
7. The report highlights cooling as a **climate, health, and equity challenge**.

SETTING UP EARLY WARNING SYSTEMS IN THE HIMALAYAS

Recent Update: Scientists urged comprehensive **Early Warning Systems (EWS)** for Himalayan hazards.

About:

1. The Himalayas face rising risks from **cloudbursts, landslides, GLOFs, and floods**.
2. Between 1900–2022, nearly **40% of India's disasters** occurred in the Himalayan region.
3. Climate change is accelerating **glacial melt and rainfall extremes**.
4. EWS integrates **satellite data, sensors, and modelling** for real-time alerts.
5. Community participation enhances last-mile disaster response.
6. Countries like **Switzerland and China** offer successful EWS models.

7. AI-driven forecasting improves disaster preparedness and resilience.

TROPICAL FOREST FOREVER FACILITY (TFFF)

Recent Update: The **TFFF** was launched at COP30 to finance tropical forest protection.



About:

1. The facility aims to mobilise **USD 125 billion** for forest conservation.
2. It rewards countries for maintaining **standing forests**, not deforestation.
3. Payments are based on **satellite-verified forest cover data**.
4. It blends **public and private finance** for long-term sustainability.
5. India joined as an observer, supporting global forest governance.
6. The model treats forests as **global public goods**.
7. It aligns climate mitigation with biodiversity conservation.

INDIA'S CARBON EMISSIONS TRENDS

Recent Update: Global Carbon Project reported slower emission growth for India.

About:

1. India's emissions reached **3.22 billion tonnes** in 2025.
2. Per capita emissions remain far below developed nations.
3. Renewable energy expansion slowed emission growth.
4. Coal still dominates the energy mix.
5. India ranks **third globally** in total emissions.

6. Energy efficiency improvements are reducing carbon intensity.
7. Balancing development and decarbonisation remains key.

SOURCE: THE HINDU

SNOW LEOPARD (PANTHERA UNCIA)

Recent Update: Himachal Pradesh recorded **83 snow leopards**, up from **51 in 2021**, in a recent survey by the **Wildlife Wing of the State Forest Department** and **NCF**.



About:

1. The **Snow Leopard (Panthera uncia)** is a **high-altitude apex predator** native to **Central and South Asian mountain systems**.
2. It is the **State Animal of Ladakh and Himachal Pradesh**, reflecting its ecological and cultural importance.
3. The species is found across **12 range countries**, including **India**, which hosts about **500–700 individuals**.
4. In India, it inhabits the **Himalayan and Trans-Himalayan regions**.
5. It served as the **mascot of Khelo India Winter Games 2024** under the name **Sheen-e-She (Shan)** in Ladakh.
6. Snow leopards play a crucial role in maintaining **mountain ecosystem balance**.
7. They are specially adapted to **cold, rugged terrains** with thick fur and powerful limbs.
8. Conservation status is **Vulnerable** under the **IUCN Red List**.

PAINTED STORK

Recent Update: The **Painted Stork** was sighted again in **Kaziranga National Park** after a gap of **four years**.

About:

1. Painted Stork is a **large wading bird** belonging to the **stork family**.
2. It is distributed across the **tropical Asian plains** of the Indian subcontinent and Southeast Asia.
3. The species prefers **freshwater wetlands**, but also uses **irrigation canals** and **flooded agricultural fields**.
4. It is largely **non-migratory**, making short local movements based on food and breeding needs.
5. Painted Storks are **carnivorous and piscivorous**, feeding mainly on **small fish**.
6. Their diet also includes **crustaceans, amphibians, insects and reptiles**.
7. They nest colonially, often near water bodies.
8. Conservation status is **Near Threatened** under the **IUCN**.

SOUTHERN RIGHT WHALE

Recent Update: Southern Right Whales continue to recover in parts of the **Southern Hemisphere oceans**.



About:

1. The **Southern Right Whale (Eubalaena australis)** is one of the **four species of right whales**.
2. It is found mainly in the **Southern Hemisphere**, using sheltered bays for breeding.
3. During summer, it migrates to **cold Antarctic waters**.



4. Adults can grow up to **18 metres long** and weigh **around 60 tonnes**.
5. A distinctive feature is the presence of **white calluses** on the head hosting parasites.
6. They possess **thick blubber** for insulation in cold waters.
7. The name “right whale” originates from whalers considering them the **right whales to hunt**.
8. Conservation status is **Least Concern** under the **IUCN Red List**.

CHOWNA BUKU CHULU (ARYARAKTA)

Recent Update: Chowna Buku Chulu was discovered in **Basar, Arunachal Pradesh**, adding to India’s floral diversity.

About:

1. **Chowna Buku Chulu** is a **newly discovered Begonia species** from **Leparada district, Arunachal Pradesh**.
2. The name means “**Noble Red**” and honours **Deputy Chief Minister Chowna Mein**.
3. It is notable for its **vibrant red leaves**.
4. The species occurs in a **natural subtropical habitat**.
5. It belongs to the genus **Begonia**, comprising over **1,800 species**.
6. Begonias are native to **moist tropical and subtropical climates**.
7. Many species are used as **ornamental plants**.
8. The discovery highlights the **botanical richness of Northeast India**.

INDIAN WOLF

Recent Update: Conservation focus on the **Indian Wolf** has increased due to habitat pressures.

About:

1. The **Indian Wolf** is a subspecies of the **Grey Wolf** found in **India and Southwest Asia**.
2. It prefers **scrublands, semi-arid grasslands and pastoral agro-ecosystems**.
3. Indian wolves live in **small packs of 6–8 individuals**.
4. They are **mostly nocturnal** and relatively **less vocal and territorial**.
5. It lacks a thick winter coat, an adaptation to **warmer climates**.
6. Major threats include **habitat loss, declining prey base and human persecution**.
7. Conservation status is **Vulnerable** under the **IUCN**.
8. It is listed under **CITES Appendix I** and **Schedule I of the Wildlife (Protection) Act, 1972**.

BLACKBUCK

Recent Update: Blackbuck conservation remains significant due to habitat fragmentation.



About:

1. The **Blackbuck (Antelope cervicapra)** is a **medium-sized antelope** native to **India and Nepal**.
2. It is widely distributed across **Rajasthan, Gujarat, Madhya Pradesh, Tamil Nadu and Odisha**.



3. It is the **State Animal of Punjab, Haryana and Andhra Pradesh**.
4. The species inhabits **open grasslands, dry scrublands and sparsely forested areas**.
5. Males have **long spiralling horns**, while females are usually hornless.
6. Males are **dark brown to black**, while females are **yellowish-brown**.
7. Blackbucks can run at speeds up to **50 miles per hour**, aiding predator evasion.
8. Conservation status is **Least Concern** under the **IUCN**.

INDIAN SCOPS-OWL

Recent Update: Increased documentation of **Indian Scops-Owls** in semi-urban habitats.



About:

1. The **Indian Scops-Owl (Otus bakkamoena)** is a **small woodland owl**.
2. It is distributed across **India, Nepal, Pakistan, Sri Lanka and Iran**.
3. The species inhabits **dry forests, scrublands and semi-urban green areas**.
4. It is known for its distinctive **“whuk-whuk”** call.
5. Excellent **camouflage** is provided by its **grey-brown plumage**.

6. It roosts in **tree hollows or dense foliage**.
7. The owl is **nocturnal** in behaviour.
8. It feeds mainly on **insects, small reptiles and small mammals**.

CHRYSANTHEMUM

Recent Update: Chrysanthemum cultivation continues to expand in **subtropical and temperate regions**.



About:

1. **Chrysanthemum** is a genus of about **30 perennial flowering plant species**.
2. It belongs to the family **Asteraceae**.
3. The plant blooms in **autumn** and grows **50–150 cm tall**.
4. Flowers occur in **white, yellow or pink colours**.
5. It thrives at temperatures of **20–28°C (day)** and **15–20°C (night)**.
6. Prefers **well-drained red loamy soil** with **pH 6–7**.
7. Widely used in **traditional herbal medicine**.
8. It helps relieve **hypertension, fever, headaches and inflammation**.

KOPI LUWAK

Recent Update: Ethical concerns continue over the production of **Kopi Luwak coffee**.



About:

1. **Kopi Luwak** is among the **world's most expensive coffees**.
2. It is made from beans digested and excreted by the **Asian Palm Civet**.
3. Gut fermentation gives the coffee a **smooth, silky texture**.
4. It has flavour notes of **chocolate, caramel and nuts**.
5. The coffee has **low acidity** with a mild **lemony tang**.
6. Prices can exceed **USD 1,300 per kg**.
7. Ethical issues arise from **caging and force-feeding civets**.
8. There is increasing demand for **humane and sustainable production**.

ASOLA BHATTI WILDLIFE SANCTUARY

Recent Update: Delhi Forest Department conducted daily bird walks during **Wildlife Week**.

About:

1. **Asola Bhatti Wildlife Sanctuary** lies on the **Southern Delhi Ridge of the Aravalli Range**.
2. It extends across **southern Delhi, Faridabad and Gurugram**.
3. The sanctuary covers **32.71 sq km**.
4. It forms part of the **Southern Ridge ecosystem**.
5. The area acts as an **ecotone** between the **Aravallis and Indo-Gangetic Plain**.
6. This transition zone supports **high biodiversity**.
7. The sanctuary hosts diverse **flora and fauna**.

8. It is crucial for **urban ecological balance**.

KALI TIGER RESERVE

Recent Update: New wildlife sightings highlight the ecological richness of **Kali Tiger Reserve**.

About:

1. **Kali Tiger Reserve** is located in **Uttara Kannada district, Karnataka**.
2. It comprises **Dandeli Wildlife Sanctuary** and **Anshi National Park**.
3. The reserve lies in the **Western Ghats biodiversity hotspot**.
4. It is named after the **Kali River**, a major regional water source.
5. Vegetation includes **semi-evergreen and moist deciduous forests**.
6. Extensive **bamboo and grassland patches** are present.
7. Fauna includes **tigers, black panthers, elephants and striped hyena**.
8. The reserve is vital for **landscape-level conservation**.

AMCHANG WILDLIFE SANCTUARY

Recent Update: Amchang WLS is gaining attention for its role as a **forest corridor**.

About:

1. **Amchang Wildlife Sanctuary** is located in **Assam**.
2. It comprises **Khanapara, Amchang and South Amchang Reserve Forests**.
3. It stretches from the **Brahmaputra River** to **Meghalaya hills**.
4. The sanctuary forms a **continuous forest belt**.
5. Vegetation includes **Khasi Hill Sal Forests** and **East Himalayan forests**.
6. Fauna includes **hoolock gibbon, slow loris and Assamese macaque**.
7. It hosts endangered birds like **white-backed and slender-billed vultures**.
8. The sanctuary supports **high ecological connectivity**.

PANNA TIGER RESERVE

Recent Update: The reserve reported the death of **Vatsala, Asia's oldest elephant**, aged over 100 years.

About:

1. **Panna Tiger Reserve** is located in the **Vindhyan Range of northern Madhya Pradesh** and is the **only tiger reserve in the Bundelkhand region**.
2. The landscape is characterised by **plateaus and gorges** with a distinct **table-top topography**.
3. It lies in the **Deccan Peninsula biogeographic zone** and the **Central Highlands biotic province**.
4. The reserve was declared a **Project Tiger Reserve in 1994**.
5. The **Ken River** flows **south to north** through the reserve, shaping its ecology.
6. The area contains **ancient rock paintings** and is inhabited by **Baiga and Gond tribes**.
7. Vegetation is mainly **dry deciduous forest**, with **teak forests** in the north and **Teak-Kardhai mixed forests** in the east, marking the **northernmost limit of teak distribution**.
8. Fauna includes **tiger, leopard, sloth bear, striped hyena, wolf, wild dog, jackal, jungle cat and rusty-spotted cat**.

SATKOSIA TIGER RESERVE

Recent Update: **Odisha Human Rights Commission (OHRC)** sought records over alleged irregularities in **village relocation**.

About:

1. **Satkosia Tiger Reserve** is located in **Odisha**, spanning **Angul, Cuttack, Boudh and Nayagarh districts**.
2. It includes **Satkosia Gorge Sanctuary** and **Baisipalli Wildlife Sanctuary**, separated by the **Mahanadi River**.
3. It is also part of the **Mahanadi Elephant Reserve**.
4. The reserve lies at the **junction of the Deccan Peninsula and Eastern Ghats biogeographic zones**.
5. Terrain is **hilly**, with **moderate to steep slopes** and **narrow valleys**.

6. Vegetation comprises **tropical moist deciduous forests** and **moist peninsular low-level sal forests**.
7. Dominant flora includes **sal, asan, dhaura, bamboo and simal**.
8. Fauna includes **tiger, elephant, leopard, gaur, gharial, freshwater crocodile, giant squirrel and sloth bear**.

KARAKORAM WILDLIFE SANCTUARY

Recent Update: A proposal for **boundary redrawing and expansion** has been submitted to the **central government**.

About:

1. **Karakoram Wildlife Sanctuary** is located in **Ladakh**, along the border with **Jammu & Kashmir**.
2. It lies **north of Hemis National Park** and **east of Deosai National Park**.
3. Terrain includes **snow-covered peaks, alpine meadows** and **deep ravines**.
4. The climate is **extremely cold**, with summer temperatures often **below freezing**.
5. Major peaks include **Saltoro Kangri, Saser Kangri I and K12**.
6. **Shyok and Nubra rivers** act as key water sources.
7. Vegetation consists of **alpine plants, cold desert flora, medicinal herbs** and **glacier vegetation**.
8. Fauna includes **snow leopard, Tibetan antelope (chiru), Siberian ibex, bharal, argali and Bactrian camel**.

HASTINAPUR WILDLIFE SANCTUARY

Recent Update: Arrests were made in connection with **illegal Khair tree felling**.

About:

1. **Hastinapur Wildlife Sanctuary** is located in **Meerut district, Uttar Pradesh**, along the **northern tip of the Ganga**.
2. It was established in **1986** near the culturally significant town of **Hastinapur**.
3. The sanctuary contains **marshes, grasslands, woodlands and riverine ecosystems**.

4. The **Ganga and its tributaries** flow through the area, enhancing biodiversity.
5. Vegetation includes **wet tall grasslands, dry grasslands, scrubs and plantations**.
6. Dominant tree species are **sal, sheesham, khair and jamun**.
7. Fauna includes **Swamp Deer (state animal), hog deer, chital, sambar and Saaras Crane (state bird)**.
8. It lies on the **Central Asian Flyway**, attracting **migratory birds**, and hosts **crocodile breeding projects**.

ETURNAGARAM WILDLIFE SANCTUARY

Recent Update: An upcoming **butterfly–moth survey** has enhanced its conservation relevance.

About:

1. **Eturnagaram Wildlife Sanctuary** is located in **Mulugu district of Telangana**, near the **tri-junction with Maharashtra and Chhattisgarh**.
2. It was established in **1952**.
3. The sanctuary is shaped by the **Godavari River** and **Dayyam Vagu stream**, which divides it into two parts.
4. The landscape ranges from **steep to gentle slopes**.
5. Vegetation belongs to **tropical dry deciduous forests** with **teak and bamboo**.
6. Fauna includes **tiger, leopard, wolf, wild dog, sloth bear, gaur and giant squirrel**.
7. It contains the **Sammakka–Saralamma Temple**, adding cultural significance.
8. It is important for **river-based ecology** and **dry-deciduous biome conservation**.

COMMISSION FOR AIR QUALITY MANAGEMENT (CAQM)

Recent Update: CAQM continues coordinated action to address **Delhi-NCR air pollution**.



About:

1. **CAQM** is a **statutory body** established under the **CAQM in NCR and Adjoining Areas Act, 2021**.
2. It aims at **coordinated planning, monitoring and resolution** of air-quality issues.
3. Its jurisdiction covers **Delhi, Punjab, Haryana, Rajasthan and Uttar Pradesh**.
4. The Commission can **restrict polluting activities** and issue **binding directions**.
5. It conducts **research, investigations and monitoring** related to air pollution.
6. All its orders are **enforceable**, and it is **directly accountable to Parliament**.
7. The Chairperson holds **Secretary/Chief Secretary rank** with a **three-year tenure or up to 70 years**.
8. Members include **state representatives, technical experts, NGOs and institutions like CPCB, ISRO and NITI Aayog**.

SOURCE: PIB

NATIONAL ENVIRONMENTAL ENGINEERING RESEARCH INSTITUTE (NEERI)

Recent Update: NEERI continues supporting pollution control and sustainability initiatives nationwide.

About:

1. **NEERI** is a **premier environmental research institute** funded by the **Government of India**.
2. It was established in **1958** as **CPHERI** and renamed **NEERI** in **1974**.
3. It functions under **CSIR, Ministry of Science and Technology**.

4. NEERI focuses on **environmental management, pollution control and sustainable development**.
5. Research areas include **water supply, sewage disposal, industrial pollution and occupational health**.
6. It provides technical support to **industry, government and the public**.
7. Headquarters are in **Nagpur**.
8. It has **zonal laboratories** in **Delhi, Chennai, Hyderabad, Kolkata and Mumbai**.

IUCN WORLD CONSERVATION CONGRESS

Recent Update: India launched its **National Red List Roadmap and Vision 2025–2030** at the Congress.

About:

1. The **IUCN World Conservation Congress** is the **largest global gathering** on nature conservation.
2. It is held **once every four years**.
3. The Congress shapes **global priorities for biodiversity and climate action**.
4. The **2025 theme** is **“Powering Transformative Conservation”**.
5. It has three components: **Forum, Exhibition and Members’ Assembly**.
6. The **Members’ Assembly** is the **highest decision-making body of IUCN**.
7. **IUCN**, established in **1948**, is the world’s most diverse environmental network.
8. Governance between Congress sessions is through the **IUCN President and Council**.

BLUE FLAG CERTIFICATION

Recent Update: Multiple **Indian beaches** continue to hold **Blue Flag eco-label status**.

About:

1. **Blue Flag** is a **globally recognised eco-label** awarded by the **Foundation for Environment Education (FEE)**.
2. It is given to **beaches, marinas and sustainable tourism boats**.

3. Certification is based on **33 stringent criteria**.



4. Criteria cover **water quality, safety, cleanliness and environmental management**.

5. The programme began in **France in 1985** and expanded globally in **2001**.

6. Its objective is to promote **sustainable coastal tourism**.

7. Indian beaches like **Shivrajpur, Rushikonda, Kovalam and Radhanagar** are certified.

8. It encourages **environmental education and sound coastal governance**.

GLOBAL ENVIRONMENT FACILITY (GEF)

Recent Update: GEF continues financing projects supporting global environmental commitments.

About:

1. **GEF** was established in **1992 at the Rio Earth Summit**.
2. It funds solutions for **biodiversity loss, climate change, pollution and land degradation**.
3. GEF supports **five major environmental conventions**, including **CBD and UNFCCC**.
4. It has **184 member countries**, including **India**.
5. The **GEF Council** is its main governing body.
6. Projects are financed through the **GEF Trust Fund**.
7. It supports **developing and transition economies**.
8. The Secretariat is headquartered in **Washington, D.C.**



TOPICS COVERED

- 1. Protection of Aravalli Hills**
- 2. UNFCCC COP30 – Belém Package**
- 3. Climate Change Threatens India's Tea Industry**
- 4. Early Closure of the Antarctic Ozone Hole**
- 5. Invasive Alien Plant Species Crisis**
- 6. Global Environment Outlook 2025 (UNEP GEO-7)**
- 7. Mangroves as Ecological Buffers**
- 8. Methane Emissions**
- 9. Bharat Stage Emission Norms**
- 10. Promise and Paradox of Rooftop Solar Power**
- 11. India's Climate Catastrophe – PLOS Climate Report**
- 12. India's Draft Seeds Bill, 2025**
- 13. Global Rise and Risks of Ultra-Processed Foods (UPFs)**
- 14. Chambal Ravines Reclamation**
- 15. India's Data Centre Expansion & Hidden Water Crisis**
- 16. Reviving Punjab's Abandoned Borewells for Flood Mitigation**
- 17. Mission Food, Fodder and Water (FFW) Project**
- 18. Atlantic Meridional Overturning Circulation (AMOC)**
- 19. Expansion of PMFBY from 2026**
- 20. Himalayan Black Bears**
- 21. Urgent Need to Halt Biodiversity Loss**
- 22. Findings – Living Planet Report 2024**
- 23. Economic & Social Implications of Biodiversity Loss**
- 24. Virtual Water Export Crisis**
- 25. India's Climate Ambitions (NDCs & Renewables)**
- 26. Institutionalising Animal Representation**
- 27. Bioremediation**

- 28. Flagship Conservation Successes in India**
- 29. Mammals Demanding Conservation Attention in India**
- 30. Birds & Reptiles of High Conservation Concern**
- 31. Global Policy Push – From Kunming to COP16**
- 32. 50 Years of CITES**
- 33. Great Indian Bustard (GIB)**
- 34. Rhinoceros (Rhino)**
- 35. Tapanuli Orangutans**
- 36. Western Tragopan**
- 37. *Senna spectabilis***
- 38. Great Nicobar Crane**
- 39. Commission for Air Quality Management (CAQM)**
- 40. Erivan Anomalous Blue Butterfly**
- 41. Hard Corals (Stony Corals)**
- 42. Sudden Stratospheric Warming (SSW) Event**
- 43. Seventh UN Environment Assembly (UNEA-7)**
- 44. World Summit on Disaster Management (WSDM) 2025**

SOURCE: VISION MONTHLY

PROTECTION OF ARAVALLI HILLS

Recent Update: Supreme Court temporarily stayed its earlier order on the **new scientific definition of Aravalli hills** pending final decision



About

1. The **Supreme Court (SC)** upheld a scientific definition identifying Aravalli hills as **landforms rising 100 metres or more above local relief**, including clustered hill systems and supporting slopes.
2. The Court placed a **temporary stay**, directing that **no irreversible administrative or environmental actions** be taken until the case is finally adjudicated.
3. The **Centre clarified** that the framework does **not dilute protections** or allow indiscriminate mining across the range.
4. A **temporary ban on new mining leases** has been imposed until a **Management Plan for Sustainable Mining (MPSM)** is prepared.
5. Core and **inviolable areas** such as protected areas, ESZs, tiger reserves and wetlands remain **permanently mining-free zones**.
6. The **Central Empowered Committee (CEC)** recommended scientific mapping and macro-level **cumulative Environmental Impact Assessment (EIA)** of all mining activities.
7. Government identifies **illegal mining as the primary threat** and proposes stronger enforcement using **drones and surveillance technologies**.
8. The Court adopted a **calibrated approach**, allowing regulated legal mining while preventing new leases and ensuring

ecosystem restoration and carrying-capacity assessment.

UNFCCC COP 30 – BELÉM PACKAGE

Recent Update: COP30 in Brazil adopted the **Belém Package**, shifting focus from pledges to implementation



About

1. The **Belém Package** comprises **29 negotiated decisions**, emphasising stronger climate finance, just transition and faster delivery of the **Paris Agreement goals**.
2. The **Global Mutirão Agreement** prioritises **cooperation and implementation** over imposing new mandatory emission targets.
3. Brazil launched the **Global Mutirão digital platform** to bridge the gap between commitments and actual climate action.
4. A new **Just Transition Mechanism (JTM/BAM)** supports workers and economies shifting away from fossil fuels, though it lacks guaranteed funding.
5. Parties finalised the **Global Goal on Adaptation (GGA)** with **59 voluntary indicators** to measure resilience and adaptation progress.
6. The **Belém Health Action Plan** integrates health equity and climate justice to strengthen healthcare systems against climate impacts.
7. Brazil introduced the **Tropical Forests Forever Facility (TFFF)**, rewarding countries financially for conserving forests through satellite monitoring.
8. The **Belém 4x Pledge** seeks to quadruple sustainable fuels like hydrogen and biofuels by 2035 to accelerate the clean energy transition.

CLIMATE CHANGE THREATENS INDIA'S TEA INDUSTRY

Recent Update: Prolonged heat and erratic rainfall in Assam threaten livelihoods of **12 lakh tea workers**



About

1. Rising **temperatures and extreme heat** stress tea plants, causing blackened leaves, reduced nutrient absorption and irregular flush cycles.
2. **Erratic rainfall patterns** create both drought stress and flooding, leading to soil erosion and declining productivity.
3. Suitable tea-growing areas are **shifting towards higher altitudes**, such as Karbi Anglong and Dima Hasao.
4. Tea prices have risen only **4.8% annually**, far below inflation, creating an **economic viability crisis** for growers.
5. High production costs and **ageing bushes** prevent investment in climate-resilient technologies and replantation.
6. Unlike staple crops, tea growers receive **minimal government climate protection or insurance support**.
7. India is the **2nd largest producer and consumer** with Assam, West Bengal, Tamil Nadu and Kerala accounting for 96% output.
8. Solutions include **resilient varieties, micro-irrigation, agroforestry, rainwater harvesting and sustainable certification** to build climate resilience.

EARLY CLOSURE OF THE ANTARCTIC OZONE HOLE

Recent Update: Antarctic ozone hole closed unusually early in 2025, signalling **steady atmospheric recovery**

About

1. The **ozone hole** refers to seasonal thinning of stratospheric ozone below **220 Dobson Units (DU)** during austral spring.

2. Caused by a strong **polar vortex**, which traps cold air and enables ozone-destroying chemical reactions.
3. Extremely low temperatures form **polar stratospheric clouds**, accelerating chlorine and bromine-driven ozone depletion.
4. As temperatures rise, ozone-rich air mixes in, allowing **natural regeneration of the ozone layer**.
5. Early closure reflects success of the **Montreal Protocol**, which phased out CFCs and other ozone-depleting substances.
6. Reduced chlorine and bromine levels have **lowered the intensity and duration** of depletion.
7. Recovery reduces **harmful UV radiation exposure**, protecting ecosystems and human health.
8. Scientists project **full recovery by 2040 globally**, 2045 in Arctic and 2066 in Antarctica.

INVASIVE ALIEN PLANT SPECIES CRISIS

Recent Update: Study shows invasive plants spreading across **15,500 sq km annually**, causing huge economic losses



About

1. **Invasive alien plants** are non-native species that aggressively spread and **outcompete indigenous vegetation**.
2. Their expansion is accelerated by **climate change, land-use shifts, grazing and biodiversity loss**.

3. Major invaders in India include **Lantana camara**, **Chromolaena odorata** and **Prosopis juliflora**.
4. High-risk regions include **Shivalik–Terai**, **Northeast Duars**, **Aravallis**, **Dandakaranya** and **Nilgiris**.
5. They cause **biodiversity erosion and ecosystem homogenisation**, disrupting food chains and habitats.
6. Reduce access to **fodder, fuelwood and fertile land**, directly harming rural livelihoods.
7. Linked to **health issues and income loss**, deepening poverty in vulnerable communities.
8. Control requires **early detection, restoration ecology and community-based management strategies**.

GLOBAL ENVIRONMENT OUTLOOK 2025 (UNEP GEO-7)

Recent Update: UNEP released the 7th edition highlighting **worsening climate, biodiversity and pollution crises**



About

1. **Greenhouse gas emissions** continue rising annually, pushing global warming close to **1.5°C threshold**.
2. Nearly **one million species face extinction**, with 20–40% land already degraded.

3. Climate disasters cause **USD 143 billion annual losses**, while air pollution damages cost USD 8.1 trillion.
4. Pollution contributes to **9 million premature deaths** each year globally.
5. Plastic waste exceeds **8 billion tonnes**, posing ecological and health threats.
6. Report estimates **USD 20 trillion annual benefits** from strong environmental investments by 2070.
7. Calls for **circular economy, decarbonised energy systems and sustainable consumption**.
8. Warns that inaction may reduce **global GDP by 20% by 2100**, risking economic collapse.

MANGROVES AS ECOLOGICAL BUFFERS

Recent Update: Study reveals cellular traits enabling mangroves to survive extreme salinity



About

1. Mangroves are **salt-tolerant coastal ecosystems (halophytes)** thriving in intertidal tropical zones.
2. Possess **thicker cell walls and specialised tissues** that withstand high salinity and osmotic stress.
3. Some species **filter salt at roots**, while others actively **excrete salt through leaf glands**.
4. Adaptations include **pneumatophores, prop roots and viviparous seeds**, aiding respiration and stability.
5. Serve as major **blue carbon sinks**, storing 7–10 times more carbon than tropical forests.
6. Provide **nursery grounds for fisheries and wildlife**, enhancing biodiversity.

7. Act as **natural barriers against storm surges and tsunamis**, reducing coastal erosion.
8. Insights may help develop **salt-tolerant crops**, supporting climate-resilient agriculture.

METHANE EMISSIONS

Recent Update: Uncontrolled methane from landfills threatens India's **climate and urban health goals**

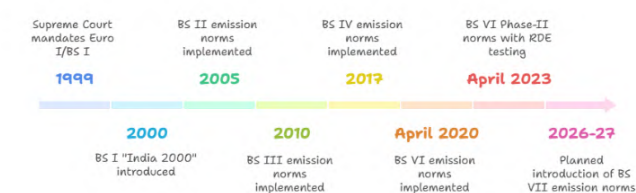
About

1. **Methane (CH₄)** is the primary component of natural gas and widely used for cooking and electricity.
2. It is a **highly potent greenhouse gas**, 84 times stronger than CO₂ over 20 years.
3. Emitted from **landfills, wastewater, livestock and fossil fuel extraction** processes.
4. India is the **third-largest emitter**, contributing about 31 million tonnes annually.
5. Landfills alone account for **15% of national methane emissions**.
6. Methane traps heat rapidly, intensifying **short-term climate change impacts**.
7. India promotes measures like **Harit Dhara, BS norms and NAPCC**, though it has not joined the Global Methane Pledge.
8. Global efforts include **IMEO and IEA Methane Tracker** for monitoring and reduction strategies.

BHARAT STAGE EMISSION NORMS

Recent Update: Delhi barred **non-BS VI vehicles** to curb severe urban air pollution

Evolution of BS Emission Norms in India



Made with Napkin

About

1. **Bharat Stage (BS) norms** regulate vehicular emissions to reduce pollutants like NO_x, PM and CO.

2. India progressed from **BS I (2000) to BS VI (2020)**, skipping BS V to align with global standards faster.
3. BS VI mandates **advanced emission-control technologies** such as Diesel Particulate Filters (DPF) and SCR systems.
4. Petrol vehicles must reduce **NO_x by 25%**, while diesel vehicles cut **PM by 82% and NO_x by 68%**.
5. Sulphur content in fuel reduced to **10 mg/kg**, enabling cleaner combustion.
6. BS VI Phase-II introduced **Real Driving Emissions (RDE) testing** for real-world compliance.
7. Older vehicles lack these technologies and exhibit **higher tailpipe emissions due to ageing engines**.
8. Future **BS VII norms (2026–27)** aim for stricter alignment with global environmental benchmarks.

SOURCE: DOWN TO EARTH

PROMISE AND PARADOX OF ROOFTOP SOLAR POWER

Recent Update: India is accelerating rooftop solar under renewable targets, yet installations remain far below the 40 GW goal



About

1. India aims to achieve **500 GW renewable capacity by 2030**, with nearly **280 GW expected from solar energy**, positioning rooftop solar as a key decentralised solution.
2. **Rooftop Solar (RTS)** enables households and commercial users to become '**prosumers**',

generating their own electricity while reducing pressure on central grids.

3. A **1 kW RTS system offsets nearly 1.2 tonnes of CO₂ annually**, supporting India's **NDC climate commitments** and cutting household bills by **30–40%**.
4. The sector creates strong **local employment**, with every **1 MW installation generating about 24 direct jobs** for technicians, electricians and maintenance workers.
5. Despite benefits, progress is slow, with only **11 GW installed against the 40 GW target**, reflecting **policy delays, weak awareness and financing gaps**.
6. **DISCOM resistance and net-metering hurdles** arise because reduced grid consumption affects their revenues, leading to bureaucratic approvals and consumer discouragement.
7. Evening peak demand occurs when **solar supply is absent**, creating **integration challenges without storage**, which destabilizes grids.
8. Long-term solutions require **smart grids, battery subsidies, peer-to-peer trading, mini-grids and tariff reforms**, making rooftop solar both economically viable and system-friendly.

INDIA'S CLIMATE CATASTROPHE – PLOS CLIMATE REPORT

Recent Update: PLOS Climate study warns India is facing accelerating **heatwaves, erratic monsoons, ocean warming and glacier melt**

About

1. India's **average temperature has risen by 0.9°C (2015–24)** compared to the early 20th century baseline, signalling rapid warming trends.
2. **Heatwaves are longer and more frequent**, with over **200 heatwave days recorded in 2024**, severely affecting northern and western states.
3. The **southwest monsoon has become erratic**, with extreme floods in some regions and droughts in others, disrupting agricultural stability.
4. The **Indian Ocean is warming at 0.12°C per decade**, triggering prolonged **marine**

heatwaves, coral bleaching, and altered monsoon circulation.

5. The **Himalayan glaciers are melting twice as fast as global averages**, threatening water supply for **700+ million people dependent on major rivers**.
6. Climate impacts are already visible, with **3,000+ heat-related deaths in five years** and projected **GDP losses of 2.8% annually by 2050**.
7. Food security risks are rising, with **wheat and rice yields expected to decline by 10–15%** under present warming scenarios.
8. Adaptation requires **climate-resilient agriculture, urban greening, early warning systems, renewable expansion and community water management**.

INDIA'S DRAFT SEEDS BILL, 2025

Recent Update: Government proposes **digital seed traceability and compulsory registration**, triggering farmer resistance



About

1. The Bill seeks to **modernize and digitize the seed sector**, replacing the outdated **Seeds Act, 1966**, and aligning with digital agriculture reforms.
2. It mandates **compulsory registration of all seed varieties**, ensuring quality control and standardized testing.
3. **Value for Cultivation and Use (VCU) testing** allows only high-performing varieties to be commercially sold.
4. **Seed dealers and distributors require licenses**, tightening regulatory oversight of seed trade and imports.

5. **QR-code based digital traceability** tracks seeds from production to sale, enhancing accountability and fraud prevention.
6. Farmer groups fear the law treats **community seed banks as commercial firms**, undermining traditional seed exchange systems.
7. VCU norms may favour **hybrid corporate seeds**, marginalizing **indigenous and climate-resilient varieties**.
8. Suggested reforms include **exempting small farmers, ensuring offline access, region-specific testing, and farmer participation in governance**.

GLOBAL RISE AND RISKS OF ULTRA-PROCESSED FOODS (UPFs)

Recent Update: The Lancet flags deep **corporate influence of UPF industries on health policies worldwide**



About

1. **Ultra-Processed Foods (UPFs)** are industrial products made with **refined ingredients, additives, preservatives and artificial flavours**, replacing traditional diets.
2. Common examples include **chips, sugary drinks, packaged snacks and ready-to-eat meals**, engineered for long shelf life and hyper-palatability.
3. Scientific evidence links UPFs to **obesity, diabetes, heart disease, kidney disorders and metabolic syndromes**.
4. High **hidden sugar, salt and fat content** disrupts gut microbiomes and promotes chronic inflammation.

5. India has witnessed a **68% rise in packaged snack consumption**, especially among youth and urban populations.
6. Corporations often employ **tobacco-style lobbying tactics**, sponsoring research and marketing products as “healthy”.
7. Rising healthcare burdens increase **public health costs and non-communicable disease prevalence**.
8. Policy responses include **front-of-pack labels, junk food taxes, marketing restrictions to children, and subsidies for fresh foods**.

EXPANSION OF PMFBY FROM 2026

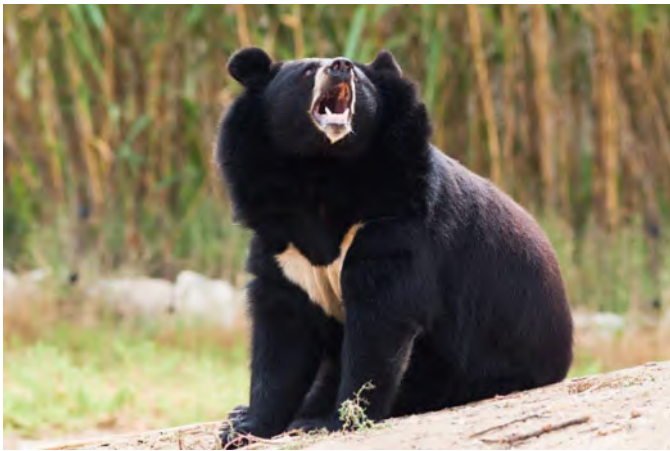
Recent Update: PMFBY now covers **wild animal attacks and paddy inundation losses**, addressing long-standing farmer demands

About

1. The **Pradhan Mantri Fasal Bima Yojana (PMFBY)** provides insurance protection against crop losses due to natural and localized risks.
2. The expansion includes **wildlife damage from nilgai, elephants and boars**, a growing issue in forest-fringe areas.
3. **Paddy inundation coverage**, earlier removed in 2018, has been reinstated to address flood-related losses.
4. States like **Bihar, Assam and West Bengal** benefit significantly due to frequent waterlogging.
5. Inclusion offers **financial stability to small and marginal farmers** vulnerable to climate variability.
6. The reform reflects recognition of **human–wildlife conflict and extreme rainfall trends**.
7. Insurance payouts reduce **distress migration and indebtedness** among rural households.
8. Strengthened implementation and faster claims settlement remain essential for effectiveness.

HIMALAYAN BLACK BEARS

Recent Update: Rising human–bear encounters in Uttarakhand lead to **first shoot-at-sight orders**, sparking conservation debate



About

- 1. The **Himalayan Black Bear (Ursus thibetanus laniger)** is a vulnerable subspecies inhabiting **temperate forests and alpine zones**.
- 2. It is protected under **WPA Schedule I**, indicating the highest legal protection.
- 3. **Climate warming disrupts hibernation cycles**, keeping bears active longer and increasing human interactions.
- 4. Rapid **habitat fragmentation and deforestation** push bears closer to settlements.
- 5. Recent months saw **70+ attacks and livestock losses**, intensifying local fear.
- 6. Shoot-at-sight measures raise concerns over **ethical and ecological consequences**.
- 7. Conservationists advocate **compensation schemes, waste control and awareness campaigns** for coexistence.
- 8. Long-term protection requires **habitat restoration and community-led mitigation strategies**.

URGENT NEED TO HALT BIODIVERSITY LOSS

Recent Update: India launched **National Red List Assessment Initiative (2024)** to align with Kunming–Montreal Biodiversity Framework targets

About

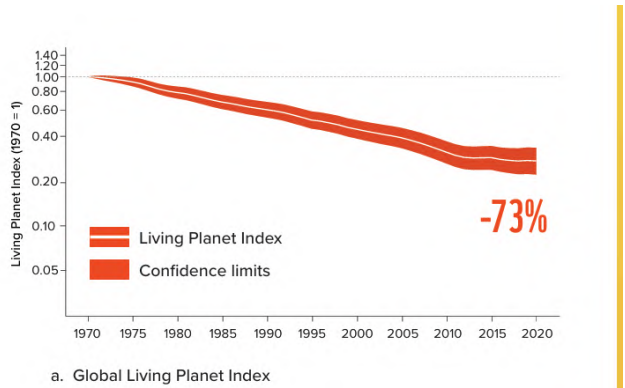
- 1. The world is witnessing an unprecedented **sixth mass extinction**, primarily driven by **human activities such as habitat destruction, pollution, overexploitation and climate change**.
- 2. Since 1500, at least **680 vertebrate species have gone extinct**, with extinction rates now

many times higher than natural background levels.

- 3. India, despite occupying only **2.4% of global land area**, hosts nearly **8% of plant species and 7.5% of animal species**, making it a major biodiversity hotspot.
- 4. The **Living Planet Report 2024** records an average **73% decline in global wildlife populations**, including severe freshwater ecosystem collapse.
- 5. Habitat loss from **agricultural expansion, urbanization, mining and infrastructure** remains the single biggest threat across continents.
- 6. Lesser-known species such as **pollinators, amphibians and insects** are disappearing silently, threatening food security and ecosystem balance.
- 7. The UN identifies biodiversity loss as part of the **“Triple Planetary Crisis” (climate change, pollution, biodiversity collapse)** directly undermining the SDGs.
- 8. Conservation now requires **nature-positive investments, protected areas expansion (30x30 goal) and community-led ecosystem restoration**.

FINDINGS – LIVING PLANET REPORT 2024

Recent Update: WWF–ZSL report shows **historic wildlife population crashes across ecosystems**



About

- 1. Global wildlife populations have declined by an alarming **73% in the last 50 years**, indicating systemic ecological stress.
- 2. **Terrestrial species** declined by nearly **69%**, reflecting deforestation and land-use change.

3. **Marine species** fell by **56%**, affected by overfishing, warming oceans and plastic pollution.
4. **Freshwater species** suffered the worst decline at **85%**, due to dams, pollution and wetland destruction.
5. Rapid **agricultural intensification** has fragmented habitats and reduced ecological corridors.
6. Overexploitation through **hunting, trade and extraction** further accelerates species loss.
7. Invasive species and emerging diseases destabilize **native ecological networks**.
8. The report warns that biodiversity decline threatens **food, water, climate stability and human survival itself**.

ECONOMIC & SOCIAL IMPLICATIONS OF BIODIVERSITY LOSS

Recent Update: UN warns biodiversity decline may cut **global GDP by 10% by 2050**

About

1. Ecosystem degradation creates a **\$300 billion annual financing gap**, especially burdening developing nations.
2. Loss of **mangroves, wetlands and forests** increases vulnerability to floods, cyclones and droughts.
3. Reduced pollinators directly affect **crop yields and farmer incomes**, worsening rural poverty.
4. Fisheries decline due to marine biodiversity loss threatens **nutrition and livelihoods of coastal communities**.
5. Healthcare costs rise as **zoonotic diseases and ecological imbalances** increase outbreak risks.
6. Nature-based sectors like tourism and forestry face **economic contraction**.
7. Climate resilience weakens as degraded ecosystems **lose carbon sequestration capacity**.
8. Investing in **restoration and conservation** generates **higher long-term economic returns** than extractive models.

SOURCE: THE HINDU

CHAMBAL RAVINES RECLAMATION

Recent Update: ISRO mapping and state projects aim to **restore degraded ravine lands into productive agroforestry zones**



About

1. The **Chambal ravines** are deep gullies formed due to **soil erosion, deforestation and unsustainable agriculture** along the Yamuna basin.
2. The semi-arid terrain accelerates **runoff erosion**, creating unusable lands and fragile ecosystems.
3. These landscapes host unique biodiversity including **gharial, Gangetic dolphin, chinkara and Indian skimmer**.
4. Ravines limit cultivation, causing **economic distress, migration and historic lawlessness**.
5. Government initiatives like **CSWCRTI reclamation and NITI Aayog agroforestry plans** aim to convert wasteland into productive areas.
6. Techniques include **check dams, bioengineering, afforestation and soil stabilization**.
7. Pilot districts show **carbon sequestration and improved livelihoods**, validating restoration models.
8. Challenges persist due to **illegal mining, policy fragmentation and weak community participation**

INDIA'S DATA CENTRE EXPANSION & HIDDEN WATER CRISIS

Recent Update: Rapid growth of AI-driven data centres raises concerns over **massive groundwater use in water-stressed regions**



About

1. India is emerging as a **global data centre hub**, driven by cloud computing, AI workloads and rising digital demand.
2. Around **150 operational facilities** already exist with **1,200–1,300 MW capacity**, expected to grow fastest in Asia-Pacific.
3. Data centres generate significant heat and rely on **water-based cooling systems**, consuming nearly **26 million litres annually per MW**.
4. Large facilities like **30 MW centres may consume hundreds of millions of litres**, equivalent to water needs of thousands of households.
5. Many centres are located in **high water-stressed zones**, worsening local groundwater depletion and community tensions.
6. Environmental oversight gaps exist, with **uncertain groundwater permissions and limited ESG transparency**.
7. Cooling alternatives include **air chillers and immersion cooling**, which reduce water use but require higher investment or energy.
8. Sustainable growth demands **water-efficient technologies, strict regulation, transparency and renewable-powered operations**.

REVIVING PUNJAB'S ABANDONED BOREWELLS FOR FLOOD MITIGATION

Recent Update: Punjab plans to convert **1.4 million defunct borewells into recharge systems** to tackle floods and groundwater decline



About

1. Punjab's **Green Revolution-era borewells** once supported irrigation but excessive extraction pushed **water tables below 150 metres**, rendering many unusable.
2. Abandoned borewells can be redesigned as **groundwater recharge structures**, turning liabilities into climate-resilience assets.
3. The process involves **hydrogeological assessment, cleaning, PVC slotted pipes and recharge shafts**, enabling safe infiltration.
4. Filter layers of **sand, gravel and pebbles** prevent silt and contamination while ensuring efficient percolation.
5. Case studies in **Gujarat and Karnataka** show improved groundwater levels, higher crop yields and rising farm incomes.
6. Recharge pits absorb **excess monsoon runoff**, reducing flood damage while replenishing aquifers.
7. Routine **desilting and maintenance** ensure long-term effectiveness and safety.
8. Large-scale adoption can **stabilize irrigation, cut public costs and strengthen climate adaptation in Punjab**.

MISSION FOOD, FODDER AND WATER (FFW) PROJECT

Recent Update: Kerala launches integrated initiative to **reduce human–wildlife conflict through ecological restoration**

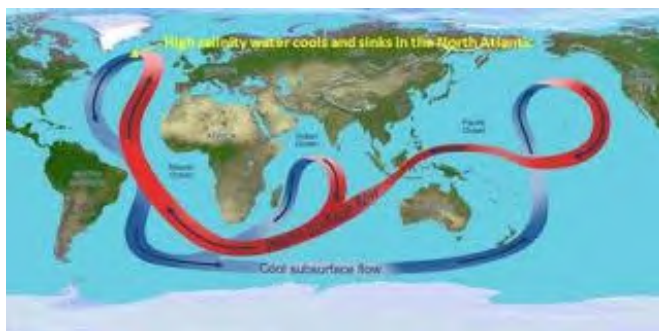
About

1. The **FFW Project** addresses interconnected crises of **food insecurity, fodder shortage and water stress** through ecosystem-based management.

2. It builds on schemes like **Jal Shakti Abhiyan, National Fodder Mission and NFSM**, merging them into a unified resilience framework.
3. Forest restoration improves **natural food and water availability**, reducing wildlife encroachment into farms.
4. Promotion of **climate-resilient crops, biofertilizers and kitchen gardens** strengthens local food security.
5. **Fodder banks and grazing land revival** support livestock productivity and reduce pressure on forests.
6. Construction of **check dams, ponds and rainwater harvesting systems** enhances groundwater recharge.
7. The mission supports **coexistence through compensation and sustainable livelihoods**.
8. It aligns with **SDGs 2, 6, 13 and 15**, linking ecology with rural development.

ATLANTIC MERIDIONAL OVERTURNING CIRCULATION (AMOC)

Recent Update: Iceland declares potential **AMOC collapse a national security threat**, citing extreme climate risks



About

1. The **AMOC** is a vast **thermohaline current system** transporting warm tropical waters north and cold deep waters southward.
2. It regulates **European climate, sea levels, fisheries and global weather stability**.
3. The **Gulf Stream** forms its most famous component, moderating temperatures in northern Europe.
4. Freshwater influx from **Greenland ice melt** reduces salinity and weakens the sinking mechanism driving circulation.

5. Studies suggest AMOC is at its **weakest level in over 1,000 years**, indicating proximity to a tipping point.
6. Collapse could trigger **harsh European winters, disrupted monsoons and sea-level rise along U.S. coasts**.
7. Marine ecosystems and fisheries may suffer **nutrient imbalance and biodiversity loss**.
8. Monitoring and emission reduction are critical to **prevent irreversible climatic and geopolitical consequences**.

SOURCE: INSIGHTS MONTHLY

VIRTUAL WATER EXPORT CRISIS

Recent Update: India's large-scale **rice exports** are accelerating **groundwater depletion** in Punjab and Haryana



About

1. The **virtual water export crisis** refers to exporting agricultural commodities that contain large quantities of **embedded irrigation water**, effectively transferring scarce domestic water abroad.
2. India, accounting for **nearly 40% of global rice trade**, exports over **20 million metric tonnes annually**, embedding billions of cubic metres of groundwater.
3. Rice cultivation is highly **water-intensive**, requiring **3,000–4,000 litres per kg**, making it ecologically unsustainable in semi-arid regions.
4. Estimates suggest over **24,000+ million cubic metres of virtual water** is exported every year through rice trade alone.
5. **Distortionary subsidies** such as high MSPs and free electricity encourage excessive borewell use and discourage crop diversification.

6. **Green Revolution legacy policies** prioritised rice–wheat monoculture for food security but failed to adapt to modern water scarcity realities.
7. Weak **groundwater regulation** allows uncontrolled extraction, leading to falling water tables and aquifer stress.
8. The crisis demands **crop diversification, water pricing reforms and sustainable irrigation practices** to balance export gains with ecological security.

INDIA'S CLIMATE AMBITIONS

Recent Update: India preparing next **2035 NDCs** after achieving several 2030 renewable targets ahead of schedule



About

1. **Nationally Determined Contributions (NDCs)** are country-specific climate commitments under the **Paris Agreement**, updated every five years to guide mitigation and adaptation efforts.
2. India has pledged to reduce **emissions intensity of GDP by 45% by 2030**, promoting cleaner growth while maintaining development momentum.
3. It targets **50% non-fossil installed power capacity**, expanding solar, wind, hydro, nuclear and biomass energy sources.
4. India has already **crossed 50% non-fossil capacity in 2025**, demonstrating rapid renewable expansion and policy effectiveness.
5. Emission intensity has fallen by **36%**, and India ranks **4th globally in renewables**, 3rd in solar and 4th in wind power.
6. Initiatives like **electrification of railways and urban mobility** reduce fossil fuel dependence and create structural emission cuts.

7. Challenges persist due to **rising absolute emissions, coal dependence and high investment needs** of nearly \$62 billion annually.
8. Future strategy includes **afforestation for carbon sinks, LIFE behavioural change movement, adaptation investments and climate finance mobilisation**.

INSTITUTIONALISING ANIMAL REPRESENTATION

Recent Update: Citizens' petition urges Supreme Court to strengthen **legal and institutional safeguards for animal welfare**



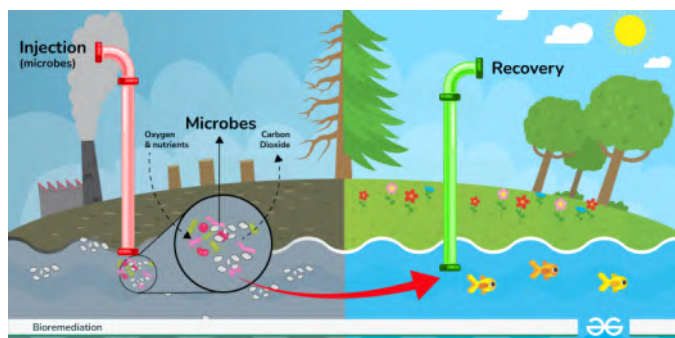
About

1. **Institutionalising animal representation** seeks to create formal legal mechanisms to safeguard animals' interests in governance and policy decisions.
2. Modern democracies are largely **anthropocentric**, treating animals as property rather than recognising them as **sentient beings with welfare rights**.
3. Despite **Article 51A(g)** and judicial recognition in the **Nagaraja (2014) case**, statutory protections remain weak and poorly enforced.
4. The **Prevention of Cruelty to Animals (PCA) Act, 1960** prescribes fines as low as ₹10–50, making penalties non-deterrent.
5. Economic sectors like **industrial farming, transport and urban expansion** routinely override animal welfare for profit.
6. Bodies such as **AWBI, SAWBs and SPCAs** lack autonomy, funds and enforcement capacity, limiting effective oversight.
7. Independent **fiduciary institutions with veterinarians and scientists** can conduct ex-ante welfare assessments to prevent systemic harm.

8. Formal representation corrects the **human–animal power imbalance**, embedding compassion, ethics and sustainability into public policy.

BIOREMEDIATION

Recent Update: Experts emphasise **bioremediation** as a low-cost, eco-friendly solution to India's rising pollution burden



About

1. **Bioremediation** involves using living organisms such as **bacteria, fungi, algae and plants** to break down or detoxify environmental pollutants.
2. It treats contaminants like **oil spills, pesticides, plastics, hydrocarbons, heavy metals and industrial chemicals** through natural biological processes.
3. **In-situ techniques** treat pollutants directly at the site using methods like **bioventing, air sparging and biobarriers**.
4. **Ex-situ methods** involve removing contaminated soil or water for treatment in controlled conditions like bioreactors or composting.
5. Compared to chemical methods, it is **cost-effective, energy-efficient and produces minimal secondary pollution**.
6. India faces urgent need due to **sewage discharge into rivers, industrial effluents and urban waste contamination**.
7. The country's rich **microbial biodiversity**, adapted to heat and salinity, enhances effectiveness of indigenous bioremediation solutions.
8. It supports **sustainable development goals** by restoring ecosystems while minimising ecological footprint of clean-up operations.

FLAGSHIP CONSERVATION SUCCESSES IN INDIA

Recent Update: Asiatic lions rise to **891 in Gir (2025)**, strengthening India's conservation credentials

About

1. **Project Tiger (1973)** has helped India host the world's largest tiger population through protected reserves and monitoring.
2. Tiger numbers are steadily rising in **Madhya Pradesh, Uttarakhand and Maharashtra**, showing policy success.
3. **Project Lion** has revived Asiatic lions in Gujarat's Gir landscape through habitat protection and prey management.
4. Lion population increased from **674 (2020) to 891 (2025)**, improving conservation status.
5. Strict **anti-poaching patrols and community participation** strengthened outcomes.
6. Creation of **eco-sensitive zones and corridors** improved genetic connectivity.
7. Technology like **camera traps and GIS mapping** enhanced scientific management.
8. These successes prove that **targeted conservation and political commitment deliver measurable results**.

MAMMALS DEMANDING CONSERVATION ATTENTION IN INDIA

Recent Update: Several endemic mammals remain **Vulnerable to Endangered despite legal protection**

About

1. **Mishmi Takin** inhabits Arunachal's Eastern Himalayas and is **Vulnerable**, threatened by logging and infrastructure expansion.
2. **Sangai Deer**, Manipur's state animal, survives only on **phumdis of Keibul Lamjao**, facing inbreeding and habitat degradation.
3. **Nilgiri Tahr**, endemic to Western Ghats, is **Endangered** due to deforestation and invasive plant spread.
4. **Lion-Tailed Macaque** suffers from plantation expansion and fragmentation of rainforest habitats.

5. **Western Hoolock Gibbon**, India's only ape, faces forest fragmentation and hunting pressures in Northeast India.
6. **Fishing Cat** depends on wetlands that are rapidly destroyed by urbanization and drainage.
7. **Pygmy Hog**, world's smallest wild pig, survives only in Assam grasslands vulnerable to burning and grazing.
8. These mammals require **habitat corridors, stricter protection and community-based conservation models**

BIRDS & REPTILES OF HIGH CONSERVATION CONCERN

Recent Update: Wetland and grassland birds show rapid population fragmentation across India



About

1. **Black-Necked Crane**, Ladakh's state bird, is affected by wetland disturbance and unregulated development.
2. **Bengal Florican** is **Critically Endangered**, losing grasslands to agriculture and land-use change.
3. **Cheer Pheasant** populations are small and fragmented due to grazing and hunting.
4. **Blyth's Tragopan** declines because of habitat loss and localized poaching.
5. **Western Tragopan** faces degradation of Western Himalayan forests.
6. **Red-Crowned Roofed Turtle** in the Ganga basin is **Critically Endangered**, impacted by low genetic diversity and habitat alteration.
7. **Indus River Dolphin** suffers from dams, bycatch and river pollution.

8. **King Cobra**, India's national reptile, faces habitat destruction and fear-driven killings by humans.

GLOBAL POLICY PUSH – FROM KUNMING TO COP16

Recent Update: COP16 to operationalize **30x30 goal** – protect 30% land & oceans by 2030



About

1. The **Kunming–Montreal Global Biodiversity Framework (2022)** sets measurable global conservation targets.
2. It emphasizes protecting **30% of terrestrial and marine ecosystems** within this decade.
3. Currently only **17% land and 8% oceans** are effectively protected, highlighting an implementation gap.
4. Countries are urged to integrate **biodiversity into national accounting and development planning**.
5. Financing mechanisms encourage **nature-positive investments and green budgeting**.
6. Indigenous and local communities are recognized as **key custodians of biodiversity**.
7. Restoration of degraded ecosystems is prioritized alongside protection.
8. Success depends on **political will, funding and cross-sector cooperation**.

SOURCE: INDIAN EXPRESS

50 YEARS OF CITES

Recent Update: CITES marked its **50th anniversary at Cop20 in Samarkand, Uzbekistan**, adopting major species protection decisions

About

1. **CITES (Convention on International Trade in Endangered Species)** is a legally binding treaty regulating **international wildlife trade** to ensure species survival is not threatened.

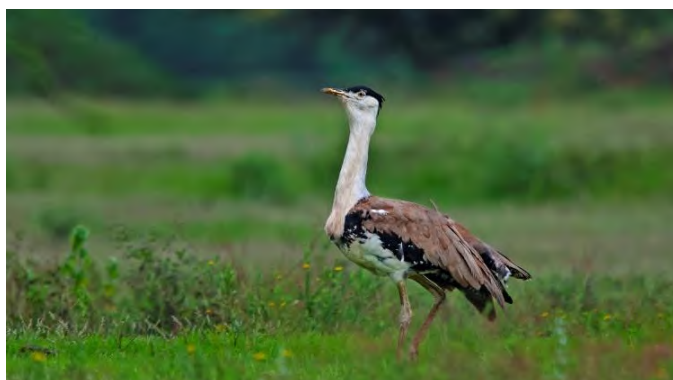
2. Conceived by **IUCN (1963)** and formalised in **1973**, it entered into force in **1975**, becoming one of the world's largest conservation agreements.
3. Currently has **185 Parties**, reflecting near-universal global participation in wildlife governance.



4. Operates through **Appendices I, II and III**, providing graded trade restrictions based on extinction risk levels.
5. Regulates trade through **permits, certificates and scientific assessments**, ensuring legality and sustainability.
6. Coordinates **enforcement against illegal wildlife trafficking**, one of the largest transnational crimes globally.
7. CoP20 added **77 species**, including sharks, rays, iguanas and reptiles, strengthening protection for marine and terrestrial biodiversity.
8. India actively participated, successfully **opposing premature listing of guggul**, emphasising need for sound scientific evidence.

GREAT INDIAN BUSTARD (GIB)

Recent Update: Supreme Court strengthened safeguards while revising **Green Energy Corridor transmission alignments**



About

1. The **Great Indian Bustard (Ardeotis nigriceps)** is one of the **heaviest flying birds globally** and the **State Bird of Rajasthan**.
2. It is a **flagship grassland species**, serving as an ecological indicator of arid and semi-arid ecosystem health.
3. Listed as **Critically Endangered (IUCN)** and protected under **Schedule I of WPA, CITES Appendix I and CMS**.
4. The global population is extremely low at **around 200 individuals**, making it highly vulnerable to extinction.
5. Major threats include **overhead power lines, habitat fragmentation, vehicular collisions and feral dogs**.
6. The **Green Energy Corridor (GEC)** aims to evacuate renewable energy but poses risks due to transmission infrastructure.
7. Courts have mandated **underground cables and safer alignments** in key habitats to minimise bird mortality.
8. Conservation integrates **energy transition with biodiversity protection**, balancing climate and ecological goals.

RHINOCEROS (RHINO)

Recent Update: Study shows **dehorning reduced poaching by 75–78%** in African reserves



About

1. The **rhinoceros** is a large herbivorous mammal of the **Rhinocerotidae family**, among the oldest surviving megafauna.

- Five species exist across **Africa and Asia**, including the Greater one-horned Indian rhino.
- Horns are composed of **keratin**, making them targets for illegal trade driven by myths and luxury demand.
- Rhinos inhabit **grasslands, savannahs, forests and wetlands**, depending on species ecology.
- Slow **reproductive rates and long gestation periods** hinder rapid population recovery.
- Classified as **Critically Endangered/Vulnerable** depending on species, with Javan and Sumatran most threatened.
- Act as **keystone species**, shaping vegetation structure through grazing and seed dispersal.
- Conservation tools include **anti-poaching patrols, habitat protection, translocation and dehorning strategies**.

TAPANULI ORANGUTANS

Recent Update: Cyclone-triggered floods threaten 6–11% of remaining population in Sumatra



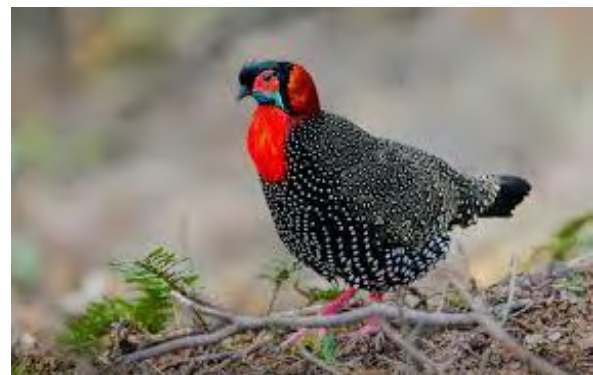
About

- The **Tapanuli orangutan (Pongo tapanuliensis)** is the **rarest great ape**, formally recognised as a separate species in 2017.
- Fewer than **800 individuals** survive, making it critically endangered globally.
- Restricted to the **Batang Toru Ecosystem, North Sumatra**, occupying highly fragmented upland rainforests.

- Exhibits **distinct skull shape, frizzier fur and unique vocalisations**, differentiating it from other orangutans.
- Highly **arboreal and solitary**, spending most of its life in forest canopies.
- Displays **advanced intelligence and tool use**, with cultural learning behaviours.
- Has one of the **slowest reproductive cycles among mammals**, increasing vulnerability to population loss.
- Faces threats from **hydropower projects, deforestation, mining and climate-induced disasters**, requiring urgent habitat protection.

WESTERN TRAGOPAN

Recent Update: Captive breeding at Sarahan Pheasantry stabilised populations, improving survival prospects



About

- The **Western Tragopan** is a rare Himalayan pheasant inhabiting **moist temperate forests at 2,400–3,600 metres**.
- Listed as **Vulnerable (IUCN)** with only **3,000–9,500 mature individuals** remaining.
- Prefers **dense undergrowth, bamboo thickets, rhododendrons and conifer forests**.
- Males display **bright crimson and blue plumage with facial wattles**, while females are camouflaged brown.
- Shy and **ground-dwelling**, active mainly during dawn and dusk hours.
- Feeds on **berries, shoots, seeds and insects**, supporting forest seed dispersal.
- Acts as an **indicator species of high-altitude forest health**.

8. Captive breeding provides an **insurance population against extinction**, strengthening conservation resilience.

SENNA SPECTABILIS

Recent Update: Tamil Nadu launched a **large-scale eradication drive** across forest divisions



About

1. **Senna spectabilis** is a fast-growing **invasive alien tree** originally introduced for ornamental and shade purposes.
2. Native to **South and Central America**, it has aggressively invaded the **Western Ghats ecosystems**.
3. Thrives in **disturbed forests and open sunlight**, outcompeting native vegetation.
4. Forms **dense canopies**, blocking light and suppressing regeneration of indigenous plants.
5. Produces **prolific hard-coated seeds**, enabling rapid spread and persistence.
6. Alters **soil composition and habitat structure**, reducing biodiversity.
7. Invades protected areas like **Nilgiris, Mudumalai and Sathyamangalam**, threatening endemic species.
8. Eradication supports **ecosystem restoration and native species recovery**.

SOURCE: DRISHTI MONTHLY

GREAT NICOBAR CRAKE

Recent Update: Rare photographic record suggests possible new endemic rail species

About

1. The **Great Nicobar Crake** is a medium-sized **ground-dwelling rail (genus Rallina)** potentially endemic to Great Nicobar Island.
2. Found only in **dense tropical rainforest undergrowth**, especially near streams and wetlands.
3. Exhibits **rufous-brown plumage with black-and-white barring**, aiding camouflage.



4. Highly **shy, elusive and rarely seen**, making scientific assessment difficult.
5. Moves quickly through leaf litter, feeding on **insects and small invertebrates**.
6. Likely qualifies as **Data Deficient or Near Threatened** due to narrow range.
7. Highlights **high endemism and biodiversity richness** of Nicobar ecosystems.
8. Strengthens the case for **strict environmental safeguards against mega infrastructure projects**.

COMMISSION FOR AIR QUALITY MANAGEMENT (CAQM)

Recent Update: CAQM issued notices to thermal plants for **violating biomass co-firing norms**



About

1. **CAQM** is a statutory body responsible for **coordinating air pollution control** in NCR and adjoining states.
2. Established in **2021**, replacing the EPCA for stronger legal enforcement.
3. Covers **Delhi, Haryana, Punjab, Rajasthan and Uttar Pradesh**, where pollution impacts NCR.
4. Plans and implements **region-wide measures** across sectors like power plants, transport and stubble burning.
5. Issues **directions, penalties and compliance monitoring** to ensure accountability.
6. Promotes solutions like **biomass co-firing and emission standards** in thermal plants.
7. Comprises **experts, officials and NGOs**, ensuring technical and policy inputs.
8. Acts as India's **integrated institutional mechanism** for tackling urban air pollution.

ERIVAN ANOMALOUS BLUE

Recent Update: Featured as **COP17 CBD logo symbol** in Armenia



About

1. The **Erivan Anomalous Blue (Polyommatus spp.)** is a rare, range-restricted butterfly endemic to Armenia.
2. Listed as **Endangered in Armenia's Red Book**, though not yet globally assessed.
3. Occurs near **Khosrov Forest Reserve and Gnishik landscapes**, with fragmented populations.
4. Highly **sensitive to habitat change**, making it vulnerable to climate and land-use pressures.

5. Butterflies act as **indicator species**, reflecting ecosystem health and plant diversity.
6. Population trends remain **uncertain due to identification challenges**.
7. Selected as **COP17 symbol**, highlighting local biodiversity in global negotiations.
8. Emphasises need for **invertebrate conservation and habitat protection**.

HARD CORALS (STONY CORALS)

Recent Update: Caribbean hard coral cover declined **48% since 1980** due to heat stress



About

1. **Hard corals** are reef-building marine animals that secrete **calcium carbonate skeletons**, forming coral reefs.
2. Live in colonies of **polyps with symbiotic zooxanthellae**, which supply energy through photosynthesis.
3. Support **one-third of marine biodiversity**, acting as fish nurseries and coastal buffers.
4. Thrive in **warm, clear, shallow waters** with stable environmental conditions.
5. Threatened by **mass bleaching events** caused by extreme sea temperature rise.
6. Affected by **Stony Coral Tissue Loss Disease (SCTLD)** spreading rapidly across the Caribbean.
7. Loss of **herbivores like sea urchins** allows macroalgae overgrowth, smothering reefs.
8. Coral decline threatens **fisheries, tourism and coastal protection services**.

SUDDEN STRATOSPHERIC WARMING (SSW) EVENT

Recent Update: Meteorologists warn of possible SSW event disrupting polar vortex

About

1. **Sudden Stratospheric Warming (SSW)** occurs when Arctic stratospheric temperatures rise sharply, weakening the polar vortex.
2. Normally, the **polar vortex traps cold air**, maintaining stable winter circulation.
3. **Rossby waves from the troposphere** disrupt this vortex, causing rapid warming.
4. Leads to **splitting or displacement of cold air masses** towards mid-latitudes.
5. Can trigger **cold waves, snowstorms and prolonged freezing spells** in North America and Europe.
6. Alters **jet streams and storm tracks**, affecting weather unpredictably.
7. Difficult to forecast **beyond 7–10 days**, complicating preparedness.
8. Highlights complex **stratosphere–troposphere climate interactions**.

SEVENTH UN ENVIRONMENT ASSEMBLY (UNEA-7)

Recent Update: Negotiations underway amid funding and strategy disputes



About

1. **UNEA** is the world's **highest environmental decision-making forum**, convened under UNEP.
2. Brings together **all UN Member States** to negotiate global environmental policies.
3. UNEA-7 held in **Nairobi, Kenya**, focusing on sustainable solutions for resilience.
4. Guides **global agenda on climate, biodiversity and pollution together**.

5. Debates UNEP's **Medium-Term Strategy (2026–30)** to align actions with global treaties.
6. Faces **funding shortfalls**, reducing operational capacity.
7. Adopts **resolutions on plastics, wildlife trade, pollution control and sustainability**.
8. Serves as a key platform for **multilateral green diplomacy and coordination**.

WORLD SUMMIT ON DISASTER MANAGEMENT (WSDM) 2025

Recent Update: Uttarakhand upgraded **early warning systems with radars and observatories**

About

1. **WSDM 2025** is a global platform promoting **disaster resilience and risk reduction strategies**.
2. Held in **Dehradun**, focusing on fragile Himalayan ecosystems.
3. Emphasises **early warning systems, weather radars and real-time forecasting**.
4. Introduces **"Nowcast" 3-hour alerts** for vulnerable districts.
5. Addresses hazards like **GLOFs, landslides, cloudbursts and forest fires**.
6. Encourages **scientific collaboration among policymakers and researchers**.
7. Integrates **technology and agri-innovation** for resilient livelihoods.
8. Strengthens India's position as a **regional leader in disaster science and climate adaptation**.



TOPICS COVERED –

1. India's Progress on its Climate Targets
2. Grasslands and Climate Change 2026
3. Amended Forest Conservation Guidelines 2026
4. India's Focus on AI and its Environmental Impact
5. *Orobanche aegyptiaca*
6. Amazon's Stingless Bees
7. Indian Skimmer (*Rynchops albicollis*)
8. Asiatic Wild Dog (Dhole)
9. Bactrian Camel
10. Kashmir Markhor
11. Dugong
12. Project Dolphin & Second Range-Wide Survey
13. Cetacean Morbillivirus
14. Olive Ridley Sea Turtles
15. Snowfall Deficit in the Western Himalayas
16. White-bellied Heron and Kalai-II Project
17. Dulhasti Stage-II Project
18. Right to a Clean and Healthy Environment
19. Nature-based Solutions (NbS)
20. Southern Ocean Carbon Anomaly
21. Sponges Mitigating Heavy Metal Pollution
22. Northern White Rhino
23. Himalayan Red Fox
24. Tapanuli Orangutan
25. Red-shanked Douc Monkey
26. Hoollock Gibbon
27. African Penguin
28. Chinese Pangolin
29. Imperial Eagle
30. Western Tragopan
31. India's First Urban Night Safari – Kukrail, Lucknow
32. Aerosols and Intensified Winter Fog
33. UN Biodiversity Beyond National Jurisdiction (BBNJ) Treaty
34. Environmental Protection Fund
35. Day Zero
36. Eco-Anxiety: Emotional Crisis of a Changing Planet
37. Waste, Infrastructure, and Eco-Anxiety in Urban India
38. Climate Change and Impact on Sports
39. Oraon Adivasi Tribe and Destruction of Nature
40. Banofi Leather and Sustainable Materials
41. Pollution and Cost of Living
42. Uninhabitable Heat and Reproductive Climate Anxiety
43. Modern Food Systems and Climate Impact

44. Cascading Effects of Species Loss
45. From Clean Cities to Contaminated Water: Indore's Hidden Crisis
46. Madhav Gadgil (1943–2026): Architect of Ecological Democracy
47. India's Nuclear Power Reforms under SHANTI Act, 2025
48. Aravalli Range and Supreme Court Scrutiny
49. Groundwater Depletion and Hidden Labour Crisis
50. National Household Income Sample Survey
51. Pink Water Lilies in Kuttanad, Kerala
52. Asian Waterbird Census (AWC) 2026
53. H5N1 Avian Influenza
54. Solid Waste Management Rules, 2026
55. Glacial Lake Outburst Floods (GLOFs)
56. International Renewable Energy Agency (IRENA)
57. Digital Climate Atlas – ACASA India
58. Ocean Heat Content Record (2025)
59. Arctic Report Card 2025
60. Water Bankruptcy
61. Carbon Credit Trading Scheme – Expansion

INDIA'S PROGRESS ON ITS CLIMATE TARGETS

Recent Update: Recent reviews indicate India is on track for **emissions intensity and renewable targets**, but absolute emissions remain rising.

About

1. India's climate commitments arise from its **Nationally Determined Contribution (NDC)** under the UNFCCC framework.
2. It aims to reduce **emissions intensity of GDP by 45% by 2030** from 2005 levels.
3. India targets **50% installed power capacity from non-fossil sources by 2030**.
4. Renewable capacity is planned to reach **500 GW by 2030**, scaling from earlier 175 GW goals.
5. The country seeks to create an additional **2.5–3 billion tonnes CO₂-equivalent forest carbon sink**.
6. India has committed to achieving **net-zero emissions by 2070** as a long-term objective.
7. Rising electricity demand pushed total emissions to **3.35 gigatonnes CO₂e**, increasing absolute emissions.
8. Coal dependence, storage gaps, and grid constraints remain key challenges to a **just energy transition**.

GRASSLANDS AND CLIMATE CHANGE 2026

Recent Update: The United Nations declared **2026 as the International Year for Rangelands and Pastoralists**.

About

1. Grasslands cover nearly **40% of Earth's land surface**, supporting pastoral and biodiversity systems.
2. Nearly **90% of grassland carbon is stored underground**, ensuring stable long-term sequestration.
3. Grasslands are more **fire-resilient than forests**, preserving soil carbon despite surface burns.
4. Their higher **albedo effect reflects solar radiation**, contributing to local climate cooling.
5. Deep root systems enhance **groundwater recharge and hydrological regulation**.

6. Climate finance disproportionately favours forests, marginalising **grassland carbon mitigation potential**.
7. Misclassification as wastelands enables conversion, undermining **biodiversity and climate resilience**.
8. Declining grasslands threaten **pastoral livelihoods, pollination services, and endemic species survival**.

AMENDED FOREST CONSERVATION GUIDELINES 2026

Recent Update: MoEFCC amended guidelines under the **Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980** allowing non-government participation.

About

1. The amendment reclassifies certain plantation activities as **forestry operations under approved management plans**.
2. It reduces prior clearance requirements while keeping supervision with the **State Forest Department**.
3. The reform addresses restoration needs highlighted in the **Indian State of Forest Report 2023**.
4. It seeks additional funding to achieve the **33% forest cover target under National Forest Policy**.
5. Private participation aims to reduce rising **paper imports and fiscal burden on government**.
6. Risks include promotion of **monoculture plantations over native ecosystems**, affecting biodiversity.
7. Dilution of safeguards like **Compensatory Afforestation (CA) and Net Present Value (NPV)** raises concerns.
8. Plantation-centric approaches may conflict with rights protected under the **Forest Rights Act**.

INDIA'S FOCUS ON AI AND ITS ENVIRONMENTAL IMPACT

Recent Update: India will host the **AI Impact Summit 2026**, promoting the "Planet Sutra" for sustainable AI development.

About

1. The IndiaAI Mission (2024) and models like **BharatGen** aim for digital sovereignty and AI innovation.

2. Data centre capacity is projected to reach **2,073 MW by 2027**, increasing electricity demand.
3. Training a single large AI model can emit over **626,000 pounds of CO₂**, raising climate concerns.
4. AI queries consume nearly **ten times more electricity than standard internet searches**.
5. Many data centres operate in **water-stressed cities like Bengaluru and Mumbai**, intensifying scarcity.
6. Rapid GPU obsolescence accelerates **electronic waste generation and toxic hardware disposal**.
7. Regulatory gaps allow cloud-based facilities to bypass **Environmental Impact Assessment oversight**.
8. India proposes expanding EIA norms and mandating **Carbon Usage Effectiveness reporting for data centres**.

OROBANCHE AEGYPTIACA

Recent Update: Rapid spread of **Orobanche aegyptiaca** threatens mustard yields in Rajasthan and Haryana.



About

1. **Orobanche aegyptiaca** is an obligate root-parasitic weed extracting water, carbon, and nutrients from mustard crops.
2. Native to the **Mediterranean–West Asian region**, it has spread across South Asia and North Africa.
3. Its seeds remain viable in soil for **up to 20 years**, causing recurring infestations.
4. It spreads through **wind, irrigation water, farm tools, and contaminated soil movement**.
5. One plant produces **40–45 flowers**, each releasing thousands of microscopic seeds.

6. Early detection is difficult because it **attaches underground before emerging above soil**.
7. Infestation causes **wilting, stunted growth, and severe yield reduction in mustard**.
8. The spread threatens India's goal of reducing **edible oil import dependence**.

AMAZON'S STINGLESS BEES

Recent Update: Peruvian municipalities granted **legal rights to Amazonian stingless bees**, first for insects globally.



About

1. Stingless bees belong to the **Meliponini tribe**, crucial pollinators of tropical ecosystems.
2. Nearly **500 species exist globally**, with about half found in the Amazon rainforest.
3. They pollinate over **80% of Amazonian flora**, sustaining biodiversity and agriculture.
4. Support crops like **coffee, cacao, avocados, and blueberries**.
5. Deeply embedded in Indigenous traditions of **Asháninka and Kukama communities**.
6. Legal rights include the **right to exist, regenerate, and maintain healthy populations**.
7. Protection mandates living in **pollution-free habitats and ecological balance**.
8. Recognition strengthens global discourse on **rights of nature jurisprudence**.

INDIAN SKIMMER (RYNCHOPS ALBICOLLIS)

Recent Update: BNHS and NMCG launched a project to conserve the endangered **Indian Skimmer**.

About

1. The Indian Skimmer is a riverine bird known for **surface-skimming feeding behaviour**.

2. Breeds along **Ganga, Chambal, Yamuna, and tributary river systems**.
3. Prefers **large slow-flowing rivers with exposed sandbars** for nesting.
4. Classified as **Endangered (IUCN Red List)** with 3,700–4,400 global individuals.
5. India hosts nearly **90% of the global population**.
6. Features a distinctive **bright orange bill with longer lower mandible**.
7. Acts as an **indicator species of healthy riverine ecosystems**.
8. Faces threats from **sand mining, river regulation, and human disturbance**.

ASIATIC WILD DOG (Dhole)

Recent Update: First camera-trap record of **Dhole** in Ratapani Tiger Reserve indicates habitat recovery.

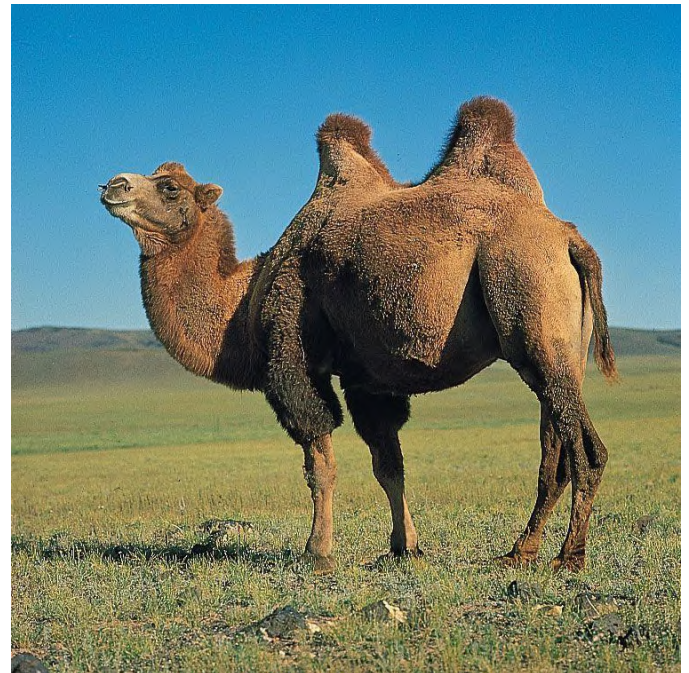


About

1. The Dhole (**Cuon alpinus**) is a social, pack-hunting wild canid of Asia.
2. Classified as **Endangered (IUCN Red List)** due to habitat fragmentation.
3. Prefers **dense forests and forest-grassland mosaics with strong prey base**.
4. Hunts cooperatively targeting **chital, sambar, and medium-sized ungulates**.
5. Distinguished by **reddish coat, rounded ears, and specialized dentition**.
6. Requires large connected habitats for **wide-ranging pack movement**.
7. Coexists with tigers and leopards through **differentiated hunting strategies**.
8. Presence signals improving **ecosystem integrity and prey availability**.

BACTRIAN CAMEL

Recent Update: Spotlight on Ladakh's **double-humped Bactrian camels** amid conservation attention.



About

1. The **Bactrian camel** is adapted to extreme cold and arid Central Asian deserts.
2. Found in India only in **Nubra Valley, Ladakh**.
3. Wild species (**Camelus ferus**) is **Critically Endangered (IUCN)**.
4. Two humps store **fat reserves for prolonged food scarcity**.
5. Possesses a **thick winter coat for sub-zero temperatures**.
6. Can consume **saline water and thorny desert vegetation**.
7. Historically vital to **Silk Road trade networks**.
8. Integral to **trans-Himalayan commerce and cultural exchange**.

KASHMIR MARKHOR

Recent Update: Population of **Kashmir Markhor** reduced to 200–300 individuals in J&K.

About

1. The Kashmir markhor is a subspecies of **Capra falconeri**, cliff-dwelling wild goat.
2. Endemic to **Jammu & Kashmir's Pir Panjal range**.

3. Survives mainly in **Kazinag National Park and Hirpora Sanctuary**.
4. Males grow spiral horns up to **160 cm length**.
5. Weighs up to **100 kg**, adapted to rugged Himalayan terrain.
6. Feeds on grasses, shrubs, and herbs, maintaining **mountain ecology balance**.
7. Faces threats from **poaching, habitat loss, and fragmentation**.
8. Conservation critical to prevent **local extinction in India**.

DUGONG

Recent Update: Conservation focus on **dugongs** as keystone marine species.



About

1. Dugong is a large marine herbivore feeding exclusively on **seagrass meadows**.
2. Classified as **Vulnerable (IUCN Red List)** globally.
3. Found in shallow coastal waters of **Indian and western Pacific Oceans**.
4. Grows up to **3 metres length and 400 kg weight**.
5. Acts as an **ecosystem engineer sustaining seagrass regeneration**.
6. Strictly marine species, unlike freshwater **manatees**.
7. Faces threats from **fishing nets, boat strikes, and habitat loss**.
8. Holds cultural significance in **coastal indigenous communities**.

PROJECT DOLPHIN & SECOND RANGE-WIDE SURVEY

Recent Update: Second nationwide **Dolphin Survey** launched under Project Dolphin.



About

1. **Project Dolphin** launched on 15 August 2020 by MoEFCC.
2. Aims to protect **riverine and oceanic dolphin species**.
3. Previous survey recorded **~6,327 river dolphins nationwide**.
4. Survey uses **hydrophones and standardized scientific protocols**.
5. Phase I covered **Ganga main stem and Indus River systems**.
6. Phase II includes **Brahmaputra, Sundarbans, and Odisha estuaries**.
7. Addresses threats like **pollution, by-catch, and flow alteration**.
8. Integrates dolphin conservation with **river ecosystem restoration policies**.

CETACEAN MORBILLIVIRUS

Recent Update: Virus detected in Arctic whales using **drone-based blow sampling techniques**.

About

1. Cetacean morbillivirus infects **whales, dolphins, porpoises, and pilot whales**.
2. Closely related to **measles and canine distemper viruses**.
3. First identified in **1987**, spreading via respiratory droplets.
4. Attacks respiratory, immune, and **nervous systems of marine mammals**.

5. Linked to **mass strandings and large-scale mortality events**.



6. Climate change may alter **migration routes increasing transmission risks**.
7. Drone monitoring enables **non-invasive disease surveillance**.
8. Highlights emerging **biosecurity challenges in Arctic ecosystems**.

OLIVE RIDLEY SEA TURTLES

Recent Update: Hatcheries set up along Chennai coast to protect **Olive Ridley eggs**.



About

1. Olive Ridley turtle is named for its **olive-green heart-shaped shell**.
2. Known for mass nesting behaviour called **arribada**.
3. Major Indian nesting sites include **Gahirmatha and Rushikulya beaches**.
4. Classified as **Vulnerable (IUCN Red List)**.
5. Protected under **Schedule I of Wildlife Protection Act, 1972**.
6. Females lay about **100 eggs per clutch**.
7. Exhibits **temperature-dependent sex determination mechanism**.

8. Threatened by **fishing nets, coastal development, and pollution**.

SOURCE: DRISHTI MONTHLY

SNOWFALL DEFICIT IN THE WESTERN HIMALAYAS

Recent Update: Uttarakhand, Himachal Pradesh, and Jammu & Kashmir recorded **severe winter rainfall deficits (Dec–Jan 2025–26)**.

About

1. Repeated dry winters indicate rising **climate variability across North India**, beyond isolated anomalies.
2. Weak and moisture-deficient **Western Disturbances (WDs)** reduced snowfall accumulation over higher altitudes.
3. Shallow low-pressure systems limited **vertical uplift and condensation**, shortening precipitation duration.
4. Altered WD trajectories shifted systems northward, reducing snowfall over **Himachal Pradesh and Uttarakhand**.
5. Weak interaction with **Bay of Bengal and Arabian Sea moisture winds** curtailed cloud formation.
6. Shifts in the **Subtropical Westerly Jet Stream** diverted or weakened incoming disturbances.
7. Rising winter temperatures raised the **snowline altitude**, converting snowfall into rainfall at mid-elevations.
8. Reduced snowpack threatens long-term **water security of Ganga, Yamuna, and Indus basins**.

CONSERVATION OF GRASSLANDS

Recent Update: UN declared **2026 as International Year of Rangelands and Pastoralists**, spotlighting grassland neglect.

About

1. Grasslands cover about **40.5% of Earth's terrestrial surface**, exceeding many forest ecosystems.
2. UNESCO defines grasslands as regions with **less than 10% tree and shrub cover**.
3. Tropical and subtropical grasslands store nearly **15% of global terrestrial carbon stocks**.

4. In India, grasslands occupy nearly **24% of geographical area**, yet remain under-protected.
5. Major regions include **Rajasthan, Gujarat, Deccan Plateau, Terai belt, and alpine Ladakh**.
6. Banni Grassland in Gujarat is considered **Asia's largest continuous grassland ecosystem**.
7. Less than **1% of Indian grasslands** fall under formal conservation protection.
8. Misclassification as wastelands accelerates **conversion, biodiversity loss, and pastoral livelihood decline**.

WHITE-BELLIED HERON AND KALAI-II PROJECT

Recent Update: Environmental clearance for **Kalai-II (1,200 MW)** project raised concerns over EIA omissions.



About White-bellied Heron

1. The **White-bellied Heron (Ardea insignis)** is the world's second-largest heron species.
2. It is classified as **Critically Endangered under IUCN Red List**.
3. It receives highest legal protection under **Schedule I of Wildlife Protection Act, 1972**.
4. Fewer than **60 individuals survive globally**, with Bhutan hosting nearly 45%.
5. In India, it inhabits **Lohit, Anjaw, and Changlang districts of Arunachal Pradesh**.
6. It depends strictly on **fast-flowing Himalayan riverine ecosystems**, sensitive to dams.
7. Hydropower projects fragment habitat and alter **river flow regimes**, threatening survival.
8. It functions as a **bio-indicator of freshwater ecosystem health and integrity**.

DULHASTI STAGE-II PROJECT

Recent Update: MoEFCC's Expert Appraisal Committee recommended clearance for **260 MW Dulhasti Stage-II project**.

About

1. Dulhasti Stage-II is a **run-of-the-river hydropower project** on the Chenab River.
2. It is located in **Kishtwar district of Jammu & Kashmir**.
3. The project will use existing infrastructure of **Dulhasti Stage-I (390 MW, commissioned 2007)**.
4. It integrates flows from **Marusudar River via Pakal Dul Hydroelectric Project**.
5. It forms part of a cascade including **Baglihar, Salal, Ratle, Kiru, and Kwar projects**.
6. The project gained strategic importance after **Indus Water Treaty suspension developments**.
7. Run-of-the-river design minimises large reservoirs but still alters **downstream hydrology and sediment flow**.
8. Environmental appraisal is conducted by **Expert Appraisal Committee under EIA Notification 2006**.

RIGHT TO A CLEAN AND HEALTHY ENVIRONMENT

Recent Update: CAQM amended **Graded Response Action Plan (GRAP)** mandating school closures under severe pollution phases.

About

1. Article 21 jurisprudence expands the **Right to Life to include clean environment**.
2. India recorded nearly **2.1 million air-pollution-related deaths in 2021**.
3. Thirteen of the world's twenty most polluted cities are located in **India (World Air Quality Report 2024)**.
4. Per capita water availability may decline to **1,219 cubic meters by 2050**, indicating scarcity.
5. Around **83.69 million hectares** faced desertification in 2018–19.
6. Soil organic carbon has fallen to nearly **0.3% in intensively farmed regions**.

7. India generates approximately **62 million tonnes of waste annually**, including hazardous categories.
8. Strengthening constitutional recognition can ensure **enforceable environmental governance and accountability mechanisms**.

NATURE-BASED SOLUTIONS (NbS)

Recent Update: COP30 in Brazil emphasised **Nature-based Solutions for accelerated climate transformation**.

About

1. NbS involve protecting and restoring ecosystems to address **climate, water, and disaster risks**.
2. Restored mangroves like **Pichavaram (Tamil Nadu)** reduced 2004 tsunami damage significantly.
3. NbS must deliver **biodiversity conservation alongside human well-being benefits**.
4. Community participation and indigenous consent are central to **equitable NbS implementation**.
5. NbS promote long-term resilience over short-term infrastructural solutions.
6. They operate best at **landscape scale rather than isolated project levels**.
7. Integration into national planning ensures cross-sectoral climate mainstreaming.
8. Adaptive management and scientific monitoring validate **NbS effectiveness and scalability**.

SOUTHERN OCEAN CARBON ANOMALY

Recent Update: Study in *Nature Climate Change* reported continued **carbon absorption by Southern Ocean** since early 2000s.

About

1. Climate models predicted weakened sink due to intensified **westerly winds and upwelling**.
2. Observations show carbon-rich waters remain trapped **100–200 metres below surface**.
3. Freshwater from melting ice enhances **surface stratification**, preventing vertical mixing.
4. Stratification acts like a lid, restricting **CO₂ release into the atmosphere**.

5. The Southern Ocean absorbs nearly **40% of anthropogenic CO₂ taken by oceans**.
6. It also absorbs around **75% of excess global heat**, moderating warming.
7. Weakening stratification could reverse the sink into a **carbon source in future**.
8. The Antarctic Circumpolar Current links major oceans, shaping **global climate regulation systems**.

SPONGES MITIGATING HEAVY METAL POLLUTION

Recent Update: Freshwater sponges in **Sundarban delta** identified as bioindicators and bioremediators.

About

1. Sponges belong to phylum **Porifera**, among the oldest multicellular organisms.
2. They filter water using **choanocytes**, trapping bacteria and organic particles.
3. Freshwater species demonstrate strong **bioaccumulation of toxic heavy metals**.
4. Microbial symbionts aid in detoxification and **bioremediation processes**.
5. They lack true tissues but possess skeletal **spicules of silica or calcium carbonate**.
6. Bioindicator role helps detect pollution in **estuarine and deltaic ecosystems**.
7. Heavy metal absorption reduces contaminant load in aquatic environments.
8. Protecting sponge habitats strengthens **wetland ecosystem restoration strategies**.

SOURCE: THE HINDU

NORTHERN WHITE RHINO

Recent Update: Only **two surviving females** remain under armed protection at Ol Pejeta Conservancy, Kenya.

About

1. The **Northern White Rhino** is a subspecies of the White Rhinoceros (*Ceratotherium simum*).
2. White rhinoceros has two subspecies: **Southern (Near Threatened)** and **Northern (Critically Endangered)**.
3. It is now **extinct in the wild**, with only two captive females surviving globally.

- Historically ranged across **Uganda, Chad,**



Sudan, CAR, and DR Congo.

- It prefers **open grasslands, savannahs, and shrublands** as grazing habitats.
- It is a **social herbivore**, living in groups of up to ten individuals.
- The species has a lifespan of **50 years in the wild** and 55 years in captivity.
- Conservation efforts focus on **advanced reproductive technologies** to prevent total extinction.

HIMALAYAN RED FOX

Recent Update: Widely distributed across the **Indian Himalayan region**, adapted to high altitudes.



About

- The Himalayan Red Fox is a subspecies of the **Red Fox (*Vulpes vulpes*)**.
- It inhabits **India, Nepal, Bhutan, and Tibet** across mountainous terrains.
- IUCN classifies it as **Least Concern** due to broad distribution.

- In India, found in **J&K, Himachal Pradesh, Uttarakhand, Sikkim, and Arunachal Pradesh**.
- Habitats include **alpine meadows, forests, grasslands, and agricultural lands**.
- It is **solitary and nocturnal**, adapted to cold, high-altitude climates.
- It can run at speeds of **up to 60 km/hr**, showing strong agility.
- The species is an **opportunistic omnivore**, feeding on rodents and small fauna.

TAPANULI ORANGUTAN

Recent Update: Recognised as a distinct species in **2017**, limited to Sumatra.

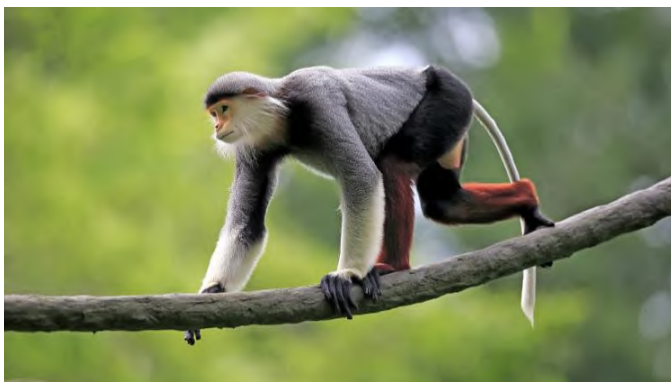


About

- The Tapanuli Orangutan is found only in **Sumatra, Indonesia**, south of Lake Toba.
- It is one of three orangutan species, alongside **Sumatran and Bornean orangutans**.
- IUCN lists it as **Critically Endangered** due to tiny population size.
- It inhabits **tropical and subtropical moist broadleaf forests**.
- It is **exclusively arboreal**, spending nearly its entire life in trees.
- The species is largely **solitary and omnivorous** in feeding habits.
- Communication includes distinctive **“rolling calls”** used for territorial signaling.
- Habitat fragmentation from dams and plantations poses severe **extinction risks**.

RED-SHANKED DOUC MONKEY

Recent Update: Known as the **“Queen of Primates”**, facing habitat loss in Southeast Asia.



About

1. The Red-shanked Douc is an Old World monkey found in **Vietnam, Laos, and Cambodia**.
2. It is classified as **Critically Endangered** by the IUCN.
3. It inhabits **tropical and subtropical evergreen forests**.
4. It is an **arboreal and diurnal herbivore**, feeding mainly on leaves.
5. Its colourful appearance earns it the title **"costumed ape"**.
6. Hunting for **traditional medicine and bushmeat** threatens its survival.
7. It plays a role in **seed dispersal and forest regeneration**.
8. Habitat fragmentation has reduced viable **breeding populations** drastically.

HOOLOCK GIBBON

Recent Update: Largest concentration found in **Hollongapar Gibbon Sanctuary, Assam**.

About

1. The Hoolock Gibbon is the **only ape species found in India**.
2. It is the **smallest and fastest of all apes**, adapted for brachiation.
3. Found in **Northeast India south of the Brahmaputra River**.
4. It is divided into **Eastern (Vulnerable) and Western (Endangered)** species.
5. Both are protected under **Schedule I of Wildlife Protection Act, 1972**.
6. They are **monogamous, arboreal, and diurnal**, living around 25 years.



7. Habitat loss from logging and plantations threatens their **forest corridors**.
8. They serve as indicators of **healthy tropical forest ecosystems**.

AFRICAN PENGUIN

Recent Update: Classified as **Critically Endangered**, facing rapid population decline.



About

1. The African Penguin (*Spheniscus demersus*) is the **only penguin species in Africa**.
2. It is also called the **Black-footed or Jackass Penguin**.
3. Found along coasts of **Namibia and South Africa**.
4. It inhabits **Benguela and western Agulhas marine ecosystems**.
5. IUCN lists it as **Critically Endangered** and CITES Appendix II.
6. It is a **flightless marine bird**, adapted for diving and fishing.
7. Average lifespan is around **20 years in the wild**.
8. Threats include overfishing, oil spills, and **climate-induced prey shifts**.

CHINESE PANGOLIN

Recent Update: Among the most trafficked mammals, listed as **Critically Endangered**.



About

1. The Chinese Pangolin is fully covered in **protective keratin scales**.
2. It inhabits **subtropical and tropical forests across Asia**.
3. IUCN categorises it as **Critically Endangered**.
4. It is primarily **nocturnal and solitary** in behaviour.
5. Feeds on ants and termites using a **40 cm long sticky tongue**.
6. Found in **southern China, Southeast Asia, and parts of Northeast India**.
7. Illegal wildlife trade for scales and meat drives severe **population decline**.
8. It plays a key role in **controlling insect populations in forests**.

IMPERIAL EAGLE

Recent Update: Eastern Imperial Eagle sighted in **Mudumalai Tiger Reserve, Tamil Nadu**.

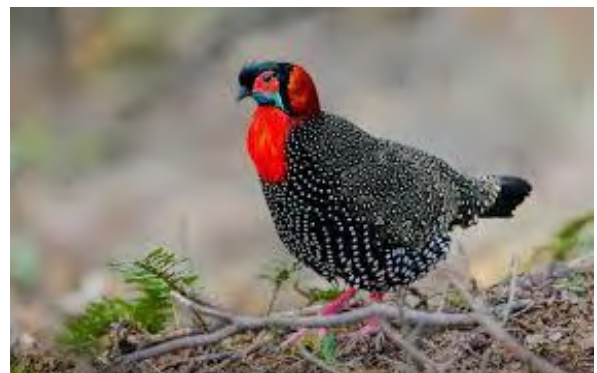


About

1. The Imperial Eagle is a large raptor native to **Eurasia**.
2. It is listed as **Vulnerable (IUCN)** and Schedule I under Indian law.
3. It is included in **CITES Appendix I**, restricting trade.
4. Prefers forests with tall trees and **open steppe habitats**.
5. Migrates to **India and northeast Africa during winters**.
6. It can travel up to **8,000 km during migration**.
7. Historically revered as a **“cross-bearing eagle”** in Europe.
8. Threats include habitat loss and **electrocution from power lines**.

WESTERN TRAGOPAN

Recent Update: Captive breeding at **Sarahan Pheasantry (Himachal Pradesh)** stabilised populations.



About

1. The Western Tragopan is the **State Bird of Himachal Pradesh**.
2. It is one of the world's rarest pheasants, called **“Jujurana”**.
3. Found in **moist temperate Himalayan forests (2,400–3,600 m)**.
4. IUCN lists it as **Vulnerable**.
5. Major habitats include **Great Himalayan National Park and Kazinag (J&K)**.
6. It prefers dense undergrowth near **oak and conifer forests**.
7. Habitat fragmentation and hunting remain major threats.
8. It acts as a flagship species for **Western Himalayan biodiversity conservation**.

SOURCE: INDIAN EXPRESS

INDIA'S FIRST URBAN NIGHT SAFARI – KUKRAIL, LUCKNOW

Recent Update: Lucknow will host India's first **urban night safari** at Kukrail Forest Area.

About

1. It is India's first **controlled urban nocturnal wildlife safari** within city limits.
2. Located at **Kukrail Forest Area, Lucknow, Uttar Pradesh**, along the Kukrail River.
3. It aims to promote **urban eco-tourism and wildlife conservation awareness**.
4. Designed as an **educational and low-impact tourism model**, not entertainment-driven spectacle.
5. Safari routes will use **restricted movement and low-intensity lighting** to minimise disturbance.
6. Existing centres for **crocodiles, gharials, and turtles** will be upgraded sustainably.
7. Infrastructure includes **bamboo huts, interpretation centres, and guided nature trails**.
8. The project integrates **conservation, recreation, and environmental education** in an urban setting.

AEROSOLS AND INTENSIFIED WINTER FOG

Recent Update: IIT Madras-led study shows **aerosols are intensifying and prolonging winter fog** in north India.

About

1. Aerosols are **tiny solid or liquid particles suspended in the atmosphere**.
2. They originate from **natural sources like dust and sea spray** and human emissions.
3. They function as **condensation nuclei**, enabling formation of fog and cloud droplets.
4. Reflective aerosols cause **surface cooling by scattering sunlight back to space**.
5. Black carbon aerosols absorb heat, contributing to **atmospheric warming effects**.
6. Aerosols can remain suspended for **days to weeks**, travelling long distances.

7. High aerosol concentration increases **fog density and duration during winter months**.
8. Health impacts include **asthma, lung infections, and cardiovascular diseases**.

UN BIODIVERSITY BEYOND NATIONAL JURISDICTION (BBNJ) TREATY

Recent Update: The High Seas Treaty entered into force after **60 ratifications in September 2025**.

About

1. The BBNJ Agreement is a **legally binding treaty under UNCLOS**.
2. It governs biodiversity conservation in **areas beyond national jurisdiction (High Seas)**.
3. It supports the global **"30 by 30" ocean protection target by 2030**.
4. Enables establishment of **Marine Protected Areas in international waters**.
5. Mandates **Environmental Impact Assessments for high-seas activities**.
6. Provides equitable sharing of benefits from **Marine Genetic Resources**.
7. Promotes **capacity building and technology transfer** for developing countries.
8. Reaffirms that no nation can claim **sovereign rights over high-seas resources**.

ENVIRONMENTAL PROTECTION FUND

Recent Update: Rules notified in January 2026 operationalised the **Environmental (Protection) Fund**.

About

1. It is a statutory fund under the **Environment (Protection) Act, 1986**.
2. Strengthened by the **Jan Vishwas Act, 2023**, which retained monetary penalties.
3. Funds arise from penalties under **Air Act 1981 and Environment Act 1986**.
4. It finances **pollution control, remediation, research, and regulatory capacity building**.
5. Seventy-five percent of penalties go to **State/UT Consolidated Fund**, 25% retained by Centre.
6. Project Management Units oversee implementation at **Central and State levels**.
7. The **Comptroller and Auditor General (CAG)** audits fund utilisation.

8. CPCB maintains a **centralised online portal for transparency and monitoring**.

DAY ZERO

Recent Update: UN warned several cities risk approaching **“Day Zero” water collapse scenarios**.

About

1. Day Zero refers to the point when **regular tap water supply is suspended**.
2. Water distribution shifts to **rationed emergency collection points**.
3. Essential services like hospitals receive **priority allocation of limited water**.
4. It results from long-term **groundwater over-extraction and climate variability**.
5. Poor urban planning and weak governance accelerate **water stress conditions**.
6. Public health crises arise due to **lack of sanitation and safe drinking water**.
7. Social inequality deepens as vulnerable communities face **disproportionate water shortages**.
8. Preventive measures require **sustainable groundwater management and climate adaptation strategies**.

SOURCE: DOWN TO EARTH

ECO-ANXIETY: EMOTIONAL CRISIS OF A CHANGING PLANET

Recent Update: UNEP’s 2024 *Navigating New Horizons* report highlights rising **eco-anxiety among global youth**.

About

1. Eco-anxiety refers to **chronic fear, grief, or stress linked to climate change and environmental degradation**.
2. It manifests as **persistent worry, helplessness, anger, and grief for lost ecosystems or futures**.
3. It is not a disorder but a **natural psychological response to planetary instability**.
4. A youth survey found **88% feel climate change around them**, and 67% report daily impacts.

5. About **57% feel anxious and 54% helpless** regarding climate change consequences.
6. Nearly **53% fear disease spread and 45% anticipate water shortages** in the future.
7. Social media exposure and perceived institutional inaction intensify **chronic environmental stress**.
8. Addressing eco-anxiety requires **stronger climate policy and mental health integration**.

WASTE, INFRASTRUCTURE, AND ECO-ANXIETY IN URBAN INDIA

Recent Update: India generates **74 million tonnes of solid waste annually (CPCB 2025)**, worsening urban stress.

About

1. India’s urban population reached **510 million in 2024**, projected to exceed 650 million by 2036.
2. Only **28% of municipal waste is scientifically processed**, the rest accumulates in dumps.
3. Peri-urban areas receive **less than one-third waste management funding per capita**.
4. Ghazipur landfill reached **65 meters height**, symbolizing infrastructural collapse.
5. Residents near dumping sites show **double risk of anxiety and respiratory distress**.
6. Informal waste workers face **toxic exposure, stigma, and livelihood insecurity**.
7. Around **42% of Indian youth report moderate to severe eco-anxiety**.
8. Solutions require **decentralized waste governance and psychosocial resilience frameworks**.

CLIMATE CHANGE AND IMPACT ON SPORTS

Recent Update: Rising global temperatures are disrupting **elite and community-level sporting events**.

About

1. Increasing heat exposure raises risk of **heatstroke and reduced athletic performance**.
2. Extreme weather causes **flooded stadiums, wildfire smoke disruptions, and event cancellations**.
3. Hotter air reduces endurance capacity in **marathons, football, and cycling events**.

4. Changing wind and water patterns affect **golf, sailing, rowing, and swimming performance**.
5. Insurance and infrastructure costs are rising due to **climate-related damage**.
6. Vulnerable communities lose access to sports facilities during **extreme climate events**.
7. Sustainable stadiums and low-carbon transport can reduce **sports-sector emissions**.
8. Sports organizations must adopt **climate-resilient infrastructure and adaptive scheduling models**.

ORAON ADIVASI TRIBE AND DESTRUCTION OF NATURE

Recent Update: Mining expansion in Jharkhand threatens **Oraon (Kurukh) ecological traditions and livelihoods**.

About

1. The Oraon tribe views forests as **sacred living entities, not exploitable resources**.
2. Sacred groves called **Sarna** are protected under strict customary norms.
3. Traditional practices include **rain-fed farming and biodiversity conservation**.
4. Mining and industrialization cause **deforestation, displacement, and river contamination**.
5. Loss of forests disrupts **food security, herbal medicine, and cultural rituals**.
6. Displacement leads to **migration, poverty, and cultural erosion**.
7. Health crises rise due to **polluted water and industrial waste exposure**.
8. Oraon communities invoke **Forest Rights Act 2006** for environmental justice.

BANOFI LEATHER AND SUSTAINABLE MATERIALS

Recent Update: Banofi Leather featured among **top five eco-material startups in 2024**.

About

1. Banofi Leather upcycles **banana stem waste into vegan leather alternatives**.
2. Production reduces water use by **85% and CO₂ emissions by up to 90%**.
3. Traditional leather accounts for **13% of fashion sector carbon emissions**.

4. Global vegan leather market valued at **USD 73.38 billion in 2023**.
5. Each tonne of banana waste prevents **2.5 tonnes of CO₂ emissions**.
6. It supports **circular economy and rural farmer livelihoods**.
7. Gen Z consumers show **67% preference for bio-based materials**.
8. Banofi aligns with **SDG 12: Responsible Consumption and Production**.

POLLUTION AND COST OF LIVING

Recent Update: Environmental degradation costs LMICs up to **8% of GDP annually (World Bank 2024)**.

About

1. Chronic PM2.5 exposure increases **urban healthcare spending by up to 20%**.
2. Cities recorded AQI above **300 for over 120 days in 2024**.
3. Over **2 billion people lack access to clean drinking water**.
4. Polluted water contributes to **1.4 million deaths annually (WHO 2024)**.
5. Soil contamination reduces crop yields by **up to 18%**, inflating food prices.
6. Microplastics detected in **over 90% of global table salt**.
7. Pollution reduces housing rents by **15–30% in affected zones**.
8. Green finance and low-carbon infrastructure are critical for **equitable sustainability transition**.

UNINHABITABLE HEAT AND REPRODUCTIVE CLIMATE ANXIETY

Recent Update: Global temperatures averaged **1.5°C above pre-industrial levels in 2025**.

About

1. Extreme heat exposure has **tripled since 1980**, especially in South Asia.
2. One-third of humanity may face **45°C regular heat by 2070**.
3. Drought duration increased by **29% since 2000**, threatening food security.
4. Freshwater availability may halve in **Indus and Nile basins before 2050**.

5. Around **39% of youth** hesitate to have children due to climate fears.
6. India recorded **60°C heat index in May 2024**, causing worker fatalities.
7. Pacific islands face **existential submersion threats**.
8. Ethical debates now include **intergenerational climate justice concerns**.

MODERN FOOD SYSTEMS AND CLIMATE IMPACT

Recent Update: Global food systems contribute **over one-third of greenhouse gas emissions (FAO 2025)**.

About

1. Industrial agriculture accelerated **monocultures and soil nutrient depletion**.
2. Agriculture consumes **70% of global freshwater resources**.
3. Livestock contributes **14.5% of human-induced GHG emissions**.
4. Over **24 billion tons of fertile soil lost annually**.
5. Biodiversity declined by **75% since 1900 due to monocropping**.
6. Thirty percent of global food produced is **wasted annually**.
7. Regenerative agriculture can cut emissions by **30% and boost biodiversity by 50%**.
8. Urban farming may supply **20% of city vegetable needs (FAO 2024)**.

CASCADING EFFECTS OF SPECIES LOSS

Recent Update: IPBES warns **one million species face extinction risk globally**.

About

1. Species loss disrupts **food webs and trophic balance mechanisms**.
2. Pollinator decline caused **32% drop in Himalayan plant regeneration**.
3. Beneficial insect loss costs agriculture **\$577 billion annually**.
4. Wetland biodiversity loss reduces **natural water filtration by 40%**.
5. Forest biodiversity decline cuts global carbon storage by **7 billion tons annually**.

6. Vertebrate populations declined by **68% since 1970 (UNEP 2024)**.
7. Insect populations are shrinking at **2% annually worldwide**.
8. Rewilding and 30x30 conservation targets aim to **restore ecological resilience**.

FROM CLEAN CITIES TO CONTAMINATED WATER: INDORE'S HIDDEN CRISIS

Recent Update: Indore, India's cleanest-ranked city, reported deaths due to **contaminated drinking water**.

About

1. Around **80% of supplied water returns as wastewater**, yet governance prioritizes supply over sewage treatment.
2. Under **AMRUT**, 62% funds went to water supply, only 34% to sewerage projects.
3. Merely **3% of ₹1.93 lakh crore** was allocated to rejuvenating waterbodies.
4. A sewage-first model emphasizes **regular desludging and scientific wastewater reuse**.
5. Existing septic systems can support **circular treatment and nutrient recovery frameworks**.
6. Linking water supply to **clean local lakes and reservoirs** strengthens groundwater recharge.
7. Performance-based financing should reward **wastewater interception and sludge reuse outcomes**.
8. Water security demands integrating **sewage management, ecological restoration, and public health safeguards**.

MADHAV GADGIL (1943–2026): ARCHITECT OF ECOLOGICAL DEMOCRACY

Recent Update: Renowned ecologist **Madhav Gadgil** passed away at 83, leaving a lasting legacy.

About

1. He founded the **Centre for Ecological Sciences at IISc Bengaluru**.
2. Chaired the **Western Ghats Ecology Expert Panel (WGEEP)** in 2010.
3. The **Gadgil Report (2011)** proposed Ecologically Sensitive Zones in Western Ghats.
4. Advocated **decentralized environmental governance through gram sabhas**.

5. Pioneered **People's Biodiversity Registers**, empowering local ecological documentation.
6. Influenced India's **Biological Diversity Act, 2002 and Biodiversity Management Committees**.
7. Linked science with democracy, promoting **community-based conservation models**.
8. Awarded the **Padma Bhushan (2006)** for contributions to environmental policy.

INDIA'S NUCLEAR POWER REFORMS UNDER SHANTI ACT, 2025

Recent Update: The **SHANTI Act, 2025** opened nuclear power to private participation.

About

1. It repealed the **Atomic Energy Act, 1962 and Civil Liability Act, 2010**.
2. Permits **49% FDI** and private entry in reactor construction and mining.
3. Introduces **composite licenses across multiple fuel-cycle stages**.
4. Caps liability at **300 million Special Drawing Rights (SDRs)**.
5. Removes statutory **supplier liability right of recourse**.
6. Grants statutory status to the **Atomic Energy Regulatory Board (AERB)**.
7. Enables government exemptions for facilities deemed of **'insignificant risk'**.
8. Targets **100 GW nuclear capacity by 2047** under India's Nuclear Mission.

ARAVALLI RANGE AND SUPREME COURT SCRUTINY

Recent Update: Supreme Court stayed its own ruling on **100-metre Aravalli definition**.



About

1. Earlier defined hills as landforms above **100 metres local relief**.
2. Only **9% of 12,081 mapped hills** meet the threshold.
3. Over **90% terrain** risked exposure to mining and urbanization.
4. Aravallis extend underground toward **Haridwar** dividing Indus-Ganga basins.
5. Region lost **32% forest cover** and **5,772.7 sq km green area**.
6. Committee relied on **unverified elevation datasets without ground validation**.
7. Mining for **lithium and rare earth elements** raises ecological concerns.
8. Court appointed High-Level Committee to reassess **scientific and ecological basis**.

GROUNDWATER DEPLETION AND HIDDEN LABOUR CRISIS

Recent Update: CGWB 2024 reports **736 blocks** classified as over-exploited.

About

1. India extracts **247.2 bcm groundwater annually** from 407.8 bcm resource.
2. Falling water tables reduce **irrigation-based agricultural employment**.
3. One-fourth rural workers depend on **casual farm labour (PLFS 2022–23)**.
4. Farmers shift to **less labour-intensive crops under water stress**.
5. Women face higher burdens of **unpaid water collection duties**.
6. Community groundwater projects under **Atal Bhujal Yojana** show dual benefits.
7. Metered electricity subsidies can curb **over-extraction incentives**.
8. Water governance must integrate **employment planning and social safety nets**.

NATIONAL HOUSEHOLD INCOME SAMPLE SURVEY

Recent Update: India to launch its first **National Household Income Sample Survey**.

About

1. It will measure **household income, expenditure, assets, and liabilities**.

2. Seeks to compute **micro-level household profit and well-being**.
3. India lacks official poverty estimates since **2012 update**.
4. 95% respondents hesitated to disclose **income and tax details**.
5. Informal sector earnings pose **measurement and recall challenges**.
6. Multidimensional poverty differs from **income-based poverty metrics**.
7. Pre-test revealed **overstated expenditures and understated incomes**.
8. Reliable data could transform **targeted welfare and fiscal policymaking**.

PINK WATER LILIES IN KUTTANAD, KERALA

Recent Update: Surge of *Nymphaea × omarana* observed in Kuttanad wetlands.

About

1. Kuttanad lies **1–2 metres below sea level**, India's lowest region.
2. 2018 floods improved soil fertility via **nutrient-rich silt deposition**.
3. Thanneermukkam barrage limits **saltwater flushing of aquatic weeds**.
4. Lilies aid **phytoremediation and soil nutrient cycling processes**.
5. Overgrowth blocks sunlight and reduces **fish habitat quality**.
6. Decomposition releases **methane, contributing to greenhouse emissions**.
7. Mechanical and biological controls offer **eco-friendly management options**.
8. Integrated governance is vital for **balancing ecology and livelihoods**.

ASIAN WATERBIRD CENSUS (AWC) 2026

Recent Update: AWC 2026 recorded **9,000 birds of 131 species** in Delhi floodplains.

About

1. Annual citizen-science waterbird survey coordinated by **Wetlands International**.
2. In India, coordinated by the **Bombay Natural History Society (BNHS)**.

3. Conducted every January during **peak migratory season**.
4. Covers rivers, lakes, marshes, estuaries, and **coastal wetlands**.
5. Tracks long-term **population trends of waterbirds**.
6. Supports designation of **Ramsar wetlands of international importance**.
7. Provides baseline data for **environmental impact assessments**.
8. Strengthens regional cooperation in **wetland conservation policies**.

H5N1 AVIAN INFLUENZA

Recent Update: Kerala reported **11 H5N1 outbreaks**, leading to 54,100 bird deaths.

About

1. Caused by **Influenza A virus (Orthomyxoviridae family)**.
2. First identified in **1996 in geese in China**.
3. Spreads among birds via **saliva, feces, and contaminated surfaces**.
4. Migratory birds act as **natural reservoirs facilitating spread**.
5. Human mortality rate exceeds **50% among confirmed cases (WHO)**.
6. Outbreaks trigger **mass culling and poultry industry losses**.
7. Biosecurity and surveillance are key **prevention strategies**.
8. Rural economies, especially duck farming regions, face **severe livelihood disruptions**.

SOURCE: VISION MONTHLY

SOLID WASTE MANAGEMENT RULES, 2026

Recent Update: The **Ministry of Environment, Forest and Climate Change notified the Solid Waste Management (SWM) Rules, 2026**, replacing the **SWM Rules, 2016**.

About

1. The **SWM Rules, 2026 are notified under the Environment (Protection) Act, 1986** and will come into full effect from **1 April 2026**.
2. The rules integrate the principles of **Circular Economy and Extended Producer**

Responsibility (EPR) to improve resource efficiency and waste recycling.

3. **Four-stream segregation of waste at source has been made mandatory**, separating waste into **wet, dry, hazardous, and sanitary** categories.
4. The rules define **Bulk Waste Generators (BWGs)** such as government offices, residential societies, institutions, and commercial establishments, assigning them responsibility for proper waste processing.
5. BWGs must **process wet waste at source wherever feasible or obtain an Extended Bulk Waste Generator Responsibility (EBWGR) certificate**.
6. A **centralised online portal** will track waste generation, processing, authorisation, and auditing of waste facilities.
7. Industries including **cement plants and waste-to-energy units are mandated to use Refuse Derived Fuel (RDF)** produced from non-recyclable municipal waste.
8. Landfilling is restricted only to **inert and non-recyclable waste**, with mandatory **biomining and bioremediation of legacy waste dumpsites**.

GLACIAL LAKE OUTBURST FLOODS (GLOFs)

Recent Update: A study by IIT Roorkee highlighted increasing risks from glacial lake expansion across the Himalayan–Karakoram region.

About

1. A **glacial lake** is a water body formed by **melting glaciers and accumulated meltwater in depressions created by glacier movement**.
2. Glacial lakes are classified into **four categories based on formation: moraine-dammed, ice-dammed, erosion-based, and other types**.
3. A **Glacial Lake Outburst Flood (GLOF)** occurs when a natural dam containing a glacial lake suddenly collapses, releasing massive volumes of water downstream.
4. GLOFs can cause **flash floods, landslides, infrastructure damage, and loss of life in downstream regions**.
5. Recent studies show that **over 31,000 glacial lakes are expanding across High Mountain Asia**, with the **Eastern Himalayas showing the highest concentration**.

6. Since **1990**, the **number, area, and volume of glacial lakes globally have increased by 53%, 51%, and 48% respectively** due to climate change.
7. Rising global temperatures accelerate **glacier retreat and formation of unstable moraine-dammed lakes**, increasing GLOF risk.
8. Major examples include the **2023 South Lhonak GLOF in Sikkim destroying the Teesta III dam** and the **2013 Chorabari lake flood in Uttarakhand**.

DIGITAL CLIMATE ATLAS – ACASA INDIA

Recent Update: The government launched the **Atlas of Climate Adaptation in Indian Agriculture (ACASA-India)** marking **15 years of the NICRA programme**.

About

1. **ACASA-India** is a digital platform that provides **location-specific climate adaptation strategies for farmers and policymakers**.
2. It has been developed by the **ICAR-led National Agricultural Research and Extension System (NARES)** in collaboration with **Borlaug Institute for South Asia (BISA)** and **CIMMYT**.
3. The platform supports **data-driven agricultural planning to help farmers cope with climate variability and extreme weather events**.
4. Insights from ACASA help governments **identify priority investments for climate risk mitigation in agriculture**.
5. The initiative builds upon the **National Innovations in Climate Resilient Agriculture (NICRA)** programme launched by ICAR in **2011**.
6. NICRA aims to **strengthen resilience of Indian agriculture through climate-resilient technologies and field demonstrations**.
7. **Climate Resilient Agriculture (CRA)** involves adopting practices that help agricultural systems **adapt to climate change while reducing environmental impact**.
8. CRA is essential because **51% of India's net sown area is rainfed and highly vulnerable to climate variability**, affecting food security and rural livelihoods.

OCEAN HEAT CONTENT RECORD (2025)

Recent Update: A study reported that **global ocean heat content reached record levels in 2025.**

About

- 1. Oceans absorb nearly **90% of the excess heat trapped by greenhouse gases**, making them the primary buffer against global warming.
- 2. In **2025, oceans absorbed about 23 zettajoules (ZJ) of additional heat**, the highest recorded since the 1960s.
- 3. Global **sea surface temperatures in 2025 were around 0.5°C above the 1981–2010 average**, among the highest ever recorded.
- 4. Rising ocean temperatures lead to **greater ocean stratification**, reducing mixing between surface and deeper layers.
- 5. Reduced mixing decreases **oxygen supply to deeper waters and limits nutrient transport**, affecting marine productivity.
- 6. Ocean warming intensifies **marine heat waves**, causing coral bleaching and disruption of marine ecosystems.
- 7. Warmer oceans provide more energy for **stronger tropical cyclones, hurricanes, and extreme rainfall events**.
- 8. Declining ocean productivity threatens **phytoplankton populations, which form the base of marine food chains**.

ARCTIC REPORT CARD 2025

Recent Update: The Arctic Report Card 2025 released by NOAA confirms that the **Arctic is warming significantly faster than the rest of the planet.**

About

- 1. Arctic surface air temperatures recorded **the highest levels since 1900 during the period October 2024–September 2025**.
- 2. The **last decade represents the ten warmest years recorded in the Arctic**, indicating rapid regional warming.
- 3. The report highlights **Atlantification**, where warmer Atlantic waters move into the Arctic Ocean altering its physical and biological properties.
- 4. Atlantification weakens **ocean stratification, accelerates sea-ice melting, and disrupts Arctic ocean circulation patterns**.
- 5. The phenomenon of **“rusting rivers” in Arctic Alaska** has turned waters orange due to **iron released from thawing permafrost soils**.

- 6. This transformation threatens **local ecosystems, fish populations, and drinking water supplies**.
- 7. The **“greening of the Arctic”** refers to increased vegetation growth in tundra regions due to warming temperatures.
- 8. These ecological shifts significantly affect **wildlife habitats, biodiversity, and livelihoods of Arctic communities**.

WATER BANKRUPTCY

Recent Update: A report by the UN University Institute for Water, Environment and Health warned that the world has entered an era of **“Global Water Bankruptcy.”**

About

- 1. **Water bankruptcy** refers to a long-term condition where **human water consumption exceeds renewable supply limits**, causing irreversible damage to water systems.
- 2. It indicates severe degradation of **rivers, lakes, aquifers, wetlands, soils, and glaciers**, reducing their capacity for recovery.
- 3. Unlike water stress or temporary water crises, **water bankruptcy represents structural depletion of natural water capital**.
- 4. Chronic **over-extraction of groundwater and surface water resources gradually depletes storage and reduces water quality**.
- 5. Large infrastructure projects such as **dams and inter-basin transfers can encourage water use beyond sustainable limits**.
- 6. Conversion of **wetlands, forests, and floodplains reduces natural water storage and filtration functions**.
- 7. Climate change intensifies water scarcity by **reducing reliable water supply and increasing variability in rainfall patterns**.
- 8. The concept highlights the need for **sustainable water management, ecosystem restoration, and integrated watershed planning**.

CARBON CREDIT TRADING SCHEME – EXPANSION

Recent Update: The government expanded the **Greenhouse Gas Emission Intensity Target Rules** under the Carbon Credit Trading Scheme.

About

- 1. The amendment expands the emission reduction regime by adding **four new**

sectors—petroleum refineries, petrochemicals, textiles, and secondary aluminium.

2. Previously covered sectors included **aluminium, cement, chlor-alkali, and pulp and paper industries.**
3. A total of **208 industrial units must reduce greenhouse gas emission intensity starting from compliance year 2025–26.**
4. The rules target **3–7% reduction in emission intensity by 2026–27 compared with the baseline year 2023–24.**
5. Emission intensity refers to **greenhouse gas emissions produced per unit of industrial output.**
6. Companies failing to meet targets must **purchase Carbon Credit Certificates (CCCs) from compliant industries.**
7. Failure to buy credits attracts **environmental compensation equal to twice the average trading price of CCCs.**
8. The scheme supports India's **Nationally Determined Contribution (NDC) commitment to reduce emission intensity of GDP by 45% by 2030 and achieve net-zero emissions by 2070.**



SOURCE: INSIGHTS MONTHLY

WETLANDS AS A NATIONAL PUBLIC GOOD

Recent Update: India added two new Ramsar sites, taking total to 98

About

1. **Wetlands** are areas **saturated with water permanently or seasonally**, forming critical ecological zones.
2. They are treated as **national public goods** as they provide **non-excludable benefits** like **flood control and water purification**.
3. Key features include **hydrology (water presence), hydric soils, and hydrophyte vegetation**.
4. They act as **ecotones (transition zones)** between terrestrial and aquatic ecosystems.
5. Major threats include **urban encroachment, pollution, invasive species, and climate change**.
6. Wetlands support **biodiversity conservation, water security, and climate resilience**.
7. Governance measures include **legal demarcation, watershed-based management, and GIS-based monitoring**.
8. Integration of **traditional knowledge and nature-based infrastructure** enhances sustainability.

ILLEGAL MINING CRISIS

Recent Update: Meghalaya rat-hole mining tragedy reignited debate on illegal mining

About

1. **Illegal mining** refers to extraction without **licenses, clearances, or despite legal bans**.
2. In Meghalaya, it occurs as **rat-hole mining using unsafe narrow tunnels**.
3. Despite a **2014 NGT ban**, the practice continues due to economic incentives.
4. Leads to **loss of human life due to collapses, explosions, and toxic exposure**.

5. Causes **environmental degradation** like **acid mine drainage and deforestation**.
6. Results in **revenue loss and fuels organized crime networks**.
7. Challenges include **politico-criminal nexus, difficult terrain, and livelihood dependence**.
8. Solutions involve **technology-based monitoring, alternative livelihoods, and strict enforcement mechanisms**.

GLOBAL CLIMATE GOVERNANCE

Recent Update: Increasing focus on strengthening climate frameworks and financing

About

1. Climate governance includes **international treaties, laws, and institutions** like UNFCCC.
2. It aims to **mitigate greenhouse gas emissions and adapt to climate impacts**.
3. Challenges include **weak implementation, lack of finance, and voluntary commitments**.
4. Development priorities often conflict with **environmental sustainability goals**.
5. Coal dependency and urbanization increase **climate vulnerability**.
6. Requires **legally binding targets and long-term financial support mechanisms**.
7. Promotes **nature-based solutions and climate risk insurance systems**.
8. Strengthening **subnational governance and global cooperation** is essential.

NATURE-BASED SOLUTIONS (NBS)

Recent Update: Growing emphasis on NBS in climate adaptation and urban planning

About

1. **Nature-Based Solutions (NBS)** are actions to **protect, manage, and restore ecosystems**.
2. Defined by IUCN, they address challenges like **climate change, food security, and water safety**.
3. Provide dual benefits of **human well-being and biodiversity conservation**.
4. Challenges include **lack of standard frameworks and greenwashing risks**.
5. Limited funding compared to **traditional grey infrastructure** restricts scaling.

- Governance issues arise due to **overlapping authorities and land tenure conflicts**.
- Requires **integration into urban planning and infrastructure systems**.
- Solutions include **green finance, community participation, and scientific monitoring**.

SOURCE: DRISHTI MONTHLY

SCENARIOS TOWARDS VIKSIT BHARAT & NET ZERO

Recent Update: NITI Aayog report outlines pathways for Viksit Bharat 2047 and Net Zero 2070

About

- The report projects India's GDP growth from **USD 4.18 trillion (2025) to USD 30 trillion by 2047**.
- It highlights a shift from **consumption-led to investment-driven economic growth model**.
- Energy transition will increase **electricity share from 21% to 60% by 2070**.
- Renewable energy capacity is expected to grow from **~164 GW to 6000+ GW**.
- India will require **USD 22.7 trillion investment with annual need of USD 500 billion**.
- Critical minerals demand will rise significantly, shifting focus from **fuel security to mineral security**.
- The transition is expected to generate **7 million green jobs by 2050**.
- Emphasizes role of **Mission LiFE and behavioural change in reducing energy demand**.

CHALLENGES IN ACHIEVING VIKSIT BHARAT & NET ZERO

Recent Update: Multiple structural and technological challenges identified in NITI Aayog report

About

- India faces an **unprecedented dual challenge of rapid growth and decarbonisation simultaneously**.
- Dependence on **critical mineral imports (lithium, cobalt, nickel)** poses supply risks.
- Technologies like **CCUS, SMRs, and energy storage** are still nascent in India.

- Financing gap of **USD 6.5 trillion** and need for foreign capital create macroeconomic challenges.
- Infrastructure expansion risks **locking in high energy demand patterns**.
- Water stress in renewable-rich regions creates **energy–water conflicts**.
- Social challenges include **just transition for 150+ fossil-fuel dependent districts**.
- Agriculture must balance **food security with emission reduction goals**.

MEASURES FOR VIKSIT BHARAT & NET ZERO

Recent Update: Policy roadmap emphasizes finance, technology, and governance reforms

About

- Promote **behavioural change through Mission LiFE and circular economy practices**.
- Develop **green finance institutions and climate finance taxonomy** to bridge funding gaps.
- Strengthen **supply chain resilience through domestic mineral exploration and KABIL**.
- Encourage **urban mobility reforms like rail, metro, and transit-oriented development**.
- Mandate **energy-efficient buildings and green construction standards**.
- Promote **green industrial policies for hydrogen, CCUS, and low-carbon manufacturing**.
- Focus on **just transition through reskilling and social protection schemes**.
- Build **robust data systems and institutional frameworks for climate governance**.

BIO-BASED CHEMICALS

Recent Update: BioE3 policy promotes bio-based chemicals as sustainable industrial alternative

About

- Bio-based chemicals** are derived from **renewable biological sources like plants and biomass**.
- Produced using **biorefineries through fermentation, enzymatic, and catalytic processes**.

3. Examples include **lactic acid, bio-ethanol, glycerol, and succinic acid**.
4. Applications span **bioplastics, pharmaceuticals, cosmetics, and industrial inputs**.
5. India has strengths in **agriculture base and fermentation expertise**.
6. Helps reduce **petrochemical import dependence and supports circular economy**.
7. Challenges include **cost competitiveness, feedstock availability, and infrastructure gaps**.
8. Offers potential for **sustainable industrial growth and green manufacturing leadership**.

GREAT NICOBAR PROJECT

Recent Update: NGT approved project with strict environmental safeguards

About

1. The project aims to develop **Great Nicobar Island as a strategic and economic hub**.
2. Key components include **ICTT, international airport, township, and power plant**.
3. Strategically located near **Malacca Strait, enhancing maritime security and trade**.
4. Supports India's **Maritime Vision 2030 and Act East Policy**.
5. Environmental safeguards include **wildlife corridors and coral protection measures**.
6. Raises concerns of **deforestation, biodiversity loss, and tribal displacement**.
7. Faces risks due to **seismic vulnerability and ecological sensitivity**.
8. Requires **sustainable planning balancing development with environmental conservation**.

CARBON CAPTURE, UTILIZATION AND STORAGE (CCUS)

Recent Update: Budget 2026–27 allocated ₹20,000 crore for CCUS development

About

1. **CCUS** involves **capturing CO₂ emissions and storing or reusing them**.
2. It includes three stages: **capture, transport, and utilization/storage**.

3. Essential for **hard-to-abate sectors like steel, cement, and chemicals**.
4. Supports India's **Net Zero goals and Paris Agreement commitments**.
5. Helps prevent **stranded assets and reduces carbon border tax risks**.
6. Challenges include **high costs, energy penalty, and infrastructure gaps**.
7. Requires **policy support like carbon markets and financial incentives**.
8. Plays a key role in **transitioning to low-carbon industrial economy**.

ARCTIC WARMING & INVASIVE SPECIES

Recent Update: Scientists warn Arctic warming is enabling invasive alien plant species expansion

About

1. **Rapid Arctic warming** is weakening natural climatic barriers, making the region suitable for **non-native plant species**.
2. Around **2,554 vascular plant species globally** could find suitable niches in the Arctic.
3. Arctic inventory already records **341 alien taxa, with 188 naturalised species**.
4. Key invasion hotspots include **Alaska, Greenland, Iceland, Fennoscandia, and Kanin–Pechora region**.
5. Spread occurs through **transport, tourism, seed contamination, and human connectivity**.
6. Invasive plants displace **native tundra vegetation like mosses, lichens, and shrubs**.
7. This threatens **Arctic biodiversity and dependent fauna**, accelerating ecological imbalance.
8. Highlights role of **climate change as a major driver of global biodiversity loss**.

INVASIVE ALIEN PLANT SPECIES (INDIA)

Recent Update: Increasing spread of invasive plants across Indian ecosystems

About

1. **Invasive alien species** are non-native plants that **outcompete native flora and disrupt ecosystems**.

2. Major species in India include **Lantana camara**, **Chromolaena odorata**, **Prosopis juliflora**.
3. Nearly **266,954 sq km** of natural habitats in India are affected.
4. High-risk regions include **Shivalik–Terai**, **Northeast**, **Aravallis**, **Dandakaranya**, **Nilgiris**.
5. Most vulnerable ecosystems are **grasslands**, **savannas**, **wetlands**, and **forest fringes**.
6. Drivers include **climate change**, **land-use change**, **altered fire regimes**, and **grazing patterns**.
7. Causes **biodiversity loss**, **reduced agricultural productivity**, and **ecosystem degradation**.
8. Requires **integrated management** including **restoration**, **monitoring**, and **community participation**.

RAT-HOLE MINING

Recent Update: Meghalaya mining tragedy highlighted continued illegal rat-hole mining

About

1. **Rat-hole mining** involves narrow **3–4 ft tunnels without safety measures or ventilation**.
2. Practiced mainly in **Meghalaya’s East Jaintia Hills and Northeast regions**.
3. Banned by **National Green Tribunal (2014)** and upheld by Supreme Court.
4. Persists due to **economic dependence**, **thin coal seams**, and **lack of alternatives**.
5. Causes severe **safety hazards** like **collapse**, **flooding**, **gas poisoning**, and **deaths**.
6. Leads to **acid mine drainage** contaminating rivers with **toxic metals**.
7. Results in **deforestation**, **air pollution**, and **health issues** like **black lung disease**.
8. Requires **tech surveillance**, **alternative livelihoods**, and **strict enforcement mechanisms**.

SACRED GROVES

Recent Update: Communal tensions disrupted traditional conservation of sacred groves

About

1. **Sacred groves** are **community-protected forest patches** with **religious and cultural significance**.
2. India has around **1–1.5 lakh** sacred groves across regions.
3. Known by local names like **Devrai**, **Kavu**, **Devarakadu**, **Oran**, **Law Kyntang**.
4. They conserve **biodiversity**, **water resources**, and **soil fertility** naturally.
5. Protected through **customary beliefs** rather than **formal legal mechanisms**.
6. Legal support exists under **WPA 1972 (Community Reserves)** and **FRA 2006**.
7. Face threats from **urbanisation**, **cultural erosion**, and **religious conflicts**.
8. Recognised globally as **effective community-based conservation models (OECMs)**.

RAMSAR SITES EXPANSION

Recent Update: India increased Ramsar sites to 98 with Patna Bird Sanctuary and Chhari-Dhand

About

1. **Ramsar Convention (1971)** aims to **conserve wetlands of international importance**.
2. India now has **98 Ramsar sites**, reflecting growing conservation efforts.
3. **Chhari-Dhand (Gujarat)** is a seasonal saline wetland supporting migratory birds.
4. It hosts **30,000 cranes** and **endangered species** like **Sociable Lapwing**.
5. **Patna Bird Sanctuary (UP)** is a small but ecologically rich wetland habitat.
6. Wetlands support **biodiversity**, **flood control**, and **water purification**.
7. India observes **World Wetlands Day** on **2 February**.
8. Strengthens India’s **global commitments** to **biodiversity conservation** and **climate resilience**.

STATE OF FINANCE FOR NATURE 2026

Recent Update: UNEP report highlights 30:1 gap between harmful and protective finance

About

1. Global **nature-negative finance** reached **USD 7.3 trillion**, harming ecosystems.

2. Nature-positive investments are only **USD 220 billion**, creating a huge gap.
3. Governments provide **USD 2.4 trillion in harmful subsidies annually**.
4. Private sector contributes **USD 4.9 trillion to environmentally damaging activities**.
5. Nature-based solutions require **USD 571 billion annually by 2030**.
6. Challenges include **lack of metrics, high costs, and investment risks**.
7. Highlights need for **green finance instruments and subsidy reforms**.
8. Emphasizes aligning finance with **Rio Conventions and sustainability goals**.

RIVER DELTA SUBSIDENCE

Recent Update: Study shows major Indian deltas sinking faster than sea-level rise

About

1. Over **50% of global deltas are subsiding faster than 3 mm/year**.
2. Indian deltas like **Brahmani and Mahanadi show rapid sinking rates (>5 mm/year)**.
3. Caused mainly by **groundwater extraction, sediment compaction, and land-use changes**.
4. Affects **236+ million people globally at flood risk**.
5. Major deltas include **Ganga-Brahmaputra, Nile, Mekong, Yangtze**.
6. Deltas support **agriculture, fisheries, and major urban centres**.
7. Leads to **coastal flooding, displacement, and ecological degradation**.
8. Requires **sustainable groundwater use and integrated coastal management**.

GREEN AMMONIA

Recent Update: India sets global benchmarks through green ammonia auctions under SIGHT

About

1. **Green ammonia (NH₃)** is produced using **renewable energy-based hydrogen and nitrogen**.
2. Uses **electrolysis and modified Haber-Bosch process** powered by clean energy.

3. Conventional ammonia emits **2–3 tonnes CO₂ per tonne produced**.
4. Applications include **fertilizers, shipping fuel, and hydrogen storage**.
5. Supports **decarbonisation of agriculture and energy sectors**.
6. SIGHT scheme provides **financial incentives under National Green Hydrogen Mission**.
7. Helps reduce **carbon footprint and fossil fuel dependence**.
8. Positions India as a **leader in global green energy transition**.

SOURCE: INDIAN EXPRESS

ADDITION OF 2 NEW WETLANDS TO INDIA'S RAMSAR LIST

Recent Update: Patna Bird Sanctuary and Chhari-Dhand added as Ramsar Sites

About

1. Two wetlands—**Patna Bird Sanctuary (Uttar Pradesh)** and **Chhari-Dhand (Gujarat)**—were designated as **Ramsar Sites under the 1971 Convention**.
2. **Patna Bird Sanctuary**, located in Etah district, is one of the **smallest bird sanctuaries in Uttar Pradesh**.
3. It hosts around **3 lakh birds from 300+ species**, including migratory waterfowl.
4. Key species include **Northern Pintail, Eurasian Wigeon, and Graylag Goose**.
5. **Chhari-Dhand Wetland** lies in **Kutch (Gujarat)** between Banni grasslands and Rann of Kutch.
6. It is a **seasonal saline wetland** supporting large populations of **flamingos, cranes, and pelicans**.
7. Provides habitat for **endangered species like Dalmatian Pelican and Indian Skimmer**.
8. Strengthens India's **wetland conservation efforts and biodiversity commitments globally**.

TURTLE TRAILS

Recent Update: Eco-tourism initiatives launched across coastal states for turtle conservation

About

1. **Turtle Trails** are **regulated eco-tourism pathways** near sea turtle nesting beaches.
2. Aim to promote **marine biodiversity conservation and community-based tourism**.
3. Implemented in states like **Odisha, Karnataka, and Kerala**.
4. Includes **guided access to nesting sites during breeding seasons**.
5. Enhances **public awareness about sea turtle conservation**.
6. Encourages **community participation involving fishers, NGOs, and volunteers**.
7. Uses **low-impact infrastructure like temporary walkways and observation zones**.
8. Integrates conservation with **sustainable livelihoods and eco-tourism policies**.

MANGROVE CLAM (GELOINA EROSA)

Recent Update: CMFRI achieved induced breeding of mangrove clam in captivity

About

1. **Geloina erosa** is a **large mangrove clam found in estuarine and mangrove ecosystems**.
2. It inhabits **organic-rich muddy substrates and tolerates wide salinity ranges**.
3. Functions as an **efficient filter feeder improving water quality**.
4. Plays a role in **nutrient recycling and sediment stabilisation**.
5. CMFRI achieved **complete life-cycle breeding under hatchery conditions**.
6. Enables **sustainable aquaculture and reduces pressure on wild populations**.
7. Supports **mangrove restoration through seed release and stock enhancement**.
8. Strengthens **blue economy and coastal ecosystem resilience**.

PROJECT TIGER

Recent Update: Government formed expert groups to modernise Project Tiger

About

1. **Project Tiger** is a **centrally sponsored scheme launched in 1973** for tiger conservation.

2. Implemented by **NTCA under Ministry of Environment, Forest and Climate Change**.
3. Aims to ensure **long-term survival of tigers and ecological balance**.
4. Expanded from **9 reserves (1973) to 51 reserves across India**.
5. Uses **core-buffer strategy balancing conservation and livelihood needs**.
6. Supported by **scientific monitoring using camera traps and ecological assessments**.
7. Provides **financial assistance for habitat protection and community development**.
8. One of the world's **most successful species conservation programmes**.

DAL LAKE

Recent Update: Continued environmental concerns over pollution and eutrophication

About

1. **Dal Lake** is a **major freshwater urban lake in Srinagar, Jammu & Kashmir**.
2. Known as the **"Jewel of Kashmir"**, central to tourism and livelihoods.
3. Covers about **18 sq km and forms part of a larger wetland ecosystem**.
4. Divided into **four basins: Gagribal, Lokut Dal, Bod Dal, and Nagin**.
5. Features **floating gardens (Raad) for agriculture and houseboats**.
6. Connected to the **Jhelum River system for hydrological balance**.
7. Faces threats like **sewage discharge, encroachment, and eutrophication**.
8. Requires **sustainable management for ecological and economic preservation**.

BEAT THE HEAT PROGRAMME

Recent Update: Global initiative launched under COP30 Presidency for heat resilience

About

1. **Beat the Heat Programme** focuses on **urban resilience against extreme heat events**.
2. Supported by **UNEP under the Cool Coalition**.
3. Aims to reduce **GHG emissions from cooling systems**.

- Promotes **nature-based cooling** like urban greening and tree cover.
- Encourages **passive cooling methods** such as cool roofs and reflective surfaces.
- Supports adoption of **energy-efficient cooling technologies**.
- Integrates heat resilience into **urban planning and infrastructure policies**.
- Helps protect **vulnerable populations** from climate-induced heat stress.

CONGO LAKES (MAI NDOMBE & TUMBA)

Recent Update: Study shows release of ancient carbon from Congo Basin lakes

About

- Lakes **Mai Ndombe and Tumba** are shallow **blackwater lakes** in Democratic Republic of Congo.
- Located in the **Cuvette Centrale** region within **Congo Basin peatlands**.
- Characterised by **high dissolved organic matter** giving dark coloration.
- Surrounding peatlands store **~30 billion metric tonnes of carbon**.
- Release of ancient carbon raises **climate change concerns**.
- Ecosystem supports **unique aquatic biodiversity** with **low oxygen conditions**.
- Lake size fluctuates seasonally due to **rainfall and flooding patterns**.
- Highlights importance of **peatland conservation** in **global climate regulation**.

INTERNATIONAL CLIMATE INITIATIVE (IKI)

Recent Update: India–Germany launched €20 million project under IKI

About

- IKI is a **German government initiative (established 2008)** supporting climate projects globally.
- Focuses on **climate mitigation, adaptation, biodiversity conservation, and REDD+**.
- Covers **150+ partner countries** including India as a **priority nation**.
- Supports implementation of **NDCs under Paris Agreement**.

- Promotes **ecosystem-based adaptation** and **innovative climate financing tools**.
- New India project targets **Himalayas, Western Ghats, Northeast, islands, and Gangetic plains**.
- Focuses on **forest restoration, groundwater recharge, and biodiversity corridors**.
- Strengthens India's **climate resilience and sustainable development goals**.

PEACOCKS

Recent Update: Peacocks spotted at unusually high altitude (~6,000 ft) near Manali

About

- Peacocks (Pavo cristatus)** are large, colourful birds of the **pheasant family (Phasianidae)** and India's **national bird**.
- Naturally inhabit **warm lowland regions** like **grasslands, forests, and agricultural fields**.
- Typically found up to **1,000–1,500 m altitude**, making recent sightings ecologically unusual.
- Males have **iridescent feathers** and **long trains** used in **courtship displays**.
- They are **omnivorous**, feeding on seeds, insects, and small reptiles, aiding pest control.
- Behaviourally, they are **ground-dwelling** but **roost on trees at night**.
- High-altitude sightings indicate **climate change-driven habitat shifts**.
- Suggests **ecosystem stress** and **changing species distribution patterns** in Himalayas.

LYRIOTHEMIS KERALENSIS

Recent Update: New dragonfly species discovered in Kerala

About

- Lyriothemis keralensis** is a newly discovered **dragonfly species (Order Odonata)** endemic to Kerala.
- Found in **vegetated pools and irrigation canals** within **plantations**.
- Recorded in **Varapetty** near **Kothamangalam (Ernakulam district)**.
- Exhibits **sexual dimorphism**—males red, females yellow with black markings.

5. Active mainly during **Southwest monsoon (May–August)**.
6. Life cycle includes **aquatic larval stage and terrestrial adult phase**.
7. Discovery highlights **rich but underexplored biodiversity of Western Ghats**.
8. Important for **ecological monitoring and conservation of freshwater habitats**.

BEARS & HIBERNATION

Recent Update: Low snowfall in Uttarakhand disrupted bear hibernation cycles

About

1. **Bears (family Ursidae)** are large **omnivorous mammals found across temperate and Arctic regions**.
2. In India, species like **sloth bears inhabit forests and hilly terrains**.
3. They exhibit **seasonal dormancy (hibernation-like state)** during winters.
4. Hibernation involves **metabolic slowdown, reduced heart rate, and energy use from fat reserves**.
5. Triggered by **food scarcity and extreme cold conditions**.
6. Bears are **not true hibernators and may wake intermittently**.
7. Climate change disrupts **snowfall patterns, affecting hibernation cycles**.
8. Leads to **increased human–wildlife conflict due to prolonged activity**.

DOLPHIN CENSUS IN ODISHA

Recent Update: Odisha recorded highest dolphin population (765) in 2026 census

About

1. Dolphin Census is an **annual scientific survey to estimate population and distribution**.
2. Conducted by **Odisha Forest Department with experts using transect surveys**.
3. Dolphins are **marine mammals (Order Cetacea)** known for intelligence and echolocation.
4. Found in **coastal waters, estuaries, and Chilika Lake** in India.

5. Species include **Irrawaddy, Humpback, Bottlenose, Spinner dolphins**.
6. Irrawaddy dolphin is **Endangered and protected under Schedule I of WPA 1972**.
7. Dolphins act as **indicators of marine ecosystem health**.
8. Census aids in **policy planning, conservation, and habitat protection**.

ARMY ANT SPECIES

Recent Update: Two new army ant species discovered in Eastern Ghats

About

1. Newly discovered species include **Aenictus chittoorensis and Aenictus lankamallensis**.
2. Army ants are **highly social, nomadic predatory ants found in tropical forests**.
3. Do not build permanent nests; instead form **temporary living structures (bivouacs)**.
4. Exhibit **coordinated mass raids to hunt prey efficiently**.
5. Completely **blind and rely on pheromones for navigation and communication**.
6. Act as **keystone predators regulating insect populations**.
7. Contribute to **nutrient cycling and forest ecosystem balance**.
8. Discovery highlights **biodiversity richness of Eastern Ghats**.

LOGGERHEAD TURTLE

Recent Update: Continued conservation focus on vulnerable marine turtle species

About

1. **Loggerhead turtle (Caretta caretta)** is a large marine turtle with **powerful jaws**.
2. Found in **Atlantic, Pacific, Indian Oceans, and Mediterranean Sea**.
3. Classified as **Vulnerable under IUCN Red List**.
4. Known for **long-distance migration and natal homing behaviour**.
5. Exhibits **temperature-dependent sex determination**.
6. Plays role in **marine ecosystem balance by controlling invertebrate populations**.

7. Contributes to **nutrient cycling on beaches through egg remains**.
8. Sensitive to **climate change, pollution, and habitat destruction**.

GALAPAGOS GIANT TORTOISE REINTRODUCTION

Recent Update: 158 hybrid tortoises reintroduced on Floreana Island

About

1. Hybrid tortoises carry DNA of **extinct *Chelonoidis niger* species**.
2. Reintroduction aims to restore **ecosystem functions of extinct species**.
3. Galapagos Islands are a **UNESCO World Heritage Site and evolutionary hotspot**.
4. Tortoises act as **ecosystem engineers by dispersing seeds and shaping vegetation**.
5. Hybrid breeding allows **species revival through genetic conservation**.
6. Tortoises show **longevity (>100 years) and high ecological resilience**.
7. Helps restore **biodiversity and ecological balance on islands**.
8. Demonstrates **innovative conservation approaches using genetics**.

MACAQUES

Recent Update: Continued ecological and behavioural studies on macaque populations

About

1. **Macaques are Old World monkeys (family Cercopithecidae) with over 20 species**.
2. Found mainly in **Asia, with some species in North Africa (Barbary macaque)**.
3. Highly adaptable to **forests, mountains, and even urban environments**.
4. Possess **cheek pouches for storing food while foraging**.
5. Exhibit **complex social hierarchies and dominance structures**.
6. Social behaviour includes **matrilineal ranking and group cooperation**.
7. Known for **intelligence, adaptability, and behavioural flexibility**.

8. Important for **ecological studies on primate behaviour and evolution**.

BACTRIAN CAMEL

Recent Update: Bactrian camels 'Galwan' and 'Nubra' featured in Republic Day Parade 2026

About

1. **Bactrian camel (*Camelus bactrianus*) is a double-humped camel adapted to cold desert climates**.
2. Found in India only in **Nubra Valley (Ladakh)** and globally in **Central Asian deserts**.
3. Known as **"ships of the Silk Road"** due to their historical trade significance.
4. Classified as **Critically Endangered (wild species)** under IUCN.
5. Can survive **extreme cold up to -40°C and harsh desert conditions**.
6. Humps store **fat reserves for survival during food and water scarcity**.
7. Capable of **eating snow for hydration and surviving long periods without water**.
8. Important for **Ladakh's ecology, transport, and tourism economy**.

PYGMY HOG

Recent Update: Continued conservation focus on critically endangered pygmy hog

About

1. **Pygmy hog is the smallest and rarest wild pig species in the world**.
2. Found only in **Assam's Manas and Orang National Parks**.
3. Prefers **undisturbed tall grassland ecosystems**.
4. Classified as **Critically Endangered under IUCN**.
5. Protected under **Schedule I of Wildlife Protection Act, 1972**.
6. Unique behaviour of **building roofed nests for shelter**.
7. Highly sensitive to **habitat loss due to agriculture and human activities**.
8. Acts as an **indicator species for grassland ecosystem health**.

PHAYRE'S LEAF MONKEY

Recent Update: Conservation attention on endangered primate species in Northeast

About

1. **Phayre's leaf monkey** is an **arboreal Old World monkey** found in Northeast India.
2. Locally known as **chasma bandor** or **chasma-chakuwa bandar**.
3. Distributed in **Tripura, Assam, Mizoram, Bangladesh, and Myanmar**.
4. Classified as **Endangered** under IUCN.
5. Listed under **CITES Appendix II** for international trade regulation.
6. Inhabits **tropical evergreen and deciduous forests**.
7. Diurnal species with **leaf-based diet (folivorous)**.
8. Threatened by **habitat fragmentation and deforestation**.

INDIAN GIANT SQUIRREL

Recent Update: Sighted during All India Tiger Estimation 2026

About

1. **Indian giant squirrel (*Ratufa indica*)** is a **large arboreal rodent** endemic to India.
2. Also known as **Malabar giant squirrel** or "**Shekru**".
3. Found in **Western Ghats, Eastern Ghats, and Satpura ranges**.
4. Classified as **Least Concern** under IUCN.
5. It is the **State animal of Maharashtra**.
6. Lives mostly on trees and is **generally solitary in nature**.
7. Plays role in **seed dispersal and forest ecosystem maintenance**.
8. Threatened by **habitat destruction and fragmentation**.

MADRAS HEDGEHOG

Recent Update: Tamil Nadu initiated first-ever study on Madras hedgehog

About

1. **Madras hedgehog (Bare-bellied hedgehog)** is a **small nocturnal mammal** found in **peninsular India**.
2. Found in **Tamil Nadu, Kerala, Andhra Pradesh, and Karnataka**.
3. Prefers **dry scrublands, grasslands, and thorn forests**.
4. Classified as **Least Concern** under IUCN.
5. Exhibits defence mechanism of **curling into a ball when threatened**.
6. One of the **three hedgehog species** found in **India**.
7. Plays role in **controlling insect populations**.
8. Requires research due to **limited ecological data availability**.

WHITE-BELLIED HERON

Recent Update: Kalai-II project clearance raises concerns over its habitat

About

1. **White-bellied heron** is the **second largest living heron species**.
2. Found in **eastern Himalayan foothills** across **India, Bhutan, and Myanmar**.
3. Classified as **Critically Endangered** under IUCN.
4. Protected under **Schedule I of Wildlife Protection Act, 1972**.
5. Inhabits **wetlands and riverine forests**.
6. Threatened by **habitat loss, hydropower projects, and disturbance**.
7. Requires **strict habitat conservation and monitoring**.
8. Indicator of **healthy freshwater ecosystems**.

AMAZONIAN STINGLESS BEES

Recent Update: Granted legal rights in Peru, first for any insect species

About

1. **Stingless bees** are **non-stinging or weak-stinging bees** found in **tropical regions**.
2. Among the **oldest bee species**, existing for **~80 million years**.
3. Around **500 species** globally, with high **diversity in Amazon rainforest**.

4. Responsible for **pollinating over 80% of Amazon plant species**.
5. Play crucial role in **ecosystem stability and biodiversity maintenance**.
6. Harmless to humans, supporting **sustainable apiculture practices**.
7. Associated with **indigenous cultural and medicinal traditions**.
8. Legal recognition highlights **importance of pollinators in ecological conservation**.

RED-EARED SLIDER TURTLE

Recent Update: Increasing concern over its spread as invasive species

About

1. **Red-eared slider turtle** is one of the **most widely introduced freshwater turtles globally**.
2. Native to **North America but now found worldwide except Antarctica**.
3. Classified as **Least Concern under IUCN** but ecologically invasive.
4. Highly adaptable and exhibits **aggressive feeding behaviour**.
5. Can live **20–50 years in the wild**.
6. Outcompetes **native species for food and habitat**.
7. Spreads rapidly due to **high reproductive rate and lack of predators**.
8. Major threat to **freshwater biodiversity and ecosystem balance**.

INDO-PACIFIC LEOPARD SHARK

Recent Update: Thailand launched rewilding programme for leopard sharks

About

1. **Indo-Pacific leopard shark (Zebra shark)** is a **reef-dwelling shark species**.
2. Found in **tropical Indo-Pacific coastal waters**.
3. Classified as **Endangered under IUCN**.
4. Named for **changing body patterns from stripes (young) to spots (adult)**.
5. It is **oviparous (egg-laying)** species.
6. Plays role in **maintaining coral reef ecosystem balance**.

7. Threatened by **overfishing, habitat loss, and climate change**.
8. Conservation includes **marine protected areas and rewilding efforts**.

IRRAWADDY DOLPHIN

Recent Update: Included in India's nationwide dolphin estimation programme

About

1. **Irrawaddy dolphin** is a **euryhaline species found in freshwater, brackish, and marine environments**.
2. Found in **Irrawaddy, Mekong, Mahakam rivers and Chilika Lake (India)**.
3. Classified as **Endangered under IUCN**.
4. Protected under **Schedule I of Wildlife Protection Act, 1972**.
5. Known for **rounded head and lack of beak unlike typical dolphins**.
6. Sensitive to **water pollution, fishing nets, and habitat degradation**.
7. Indicator of **riverine and coastal ecosystem health**.
8. Conservation supported by **Project Dolphin and protected habitats**.

BURHACHAPORI WILDLIFE SANCTUARY

Recent Update: Recognised as part of Kaziranga landscape conservation focus

About

1. **Burhachapori Wildlife Sanctuary** is located in **Assam on the southern bank of the Brahmaputra River**.
2. Forms part of the **Laokhowa–Burhachapori ecosystem**, sharing boundaries with Laokhowa Sanctuary.
3. Acts as a **buffer zone of Kaziranga Tiger Reserve**, enhancing wildlife protection.
4. Supports **diverse fauna including elephants, deer, and migratory birds**.
5. Plays a role in **floodplain ecosystem conservation of Brahmaputra valley**.
6. Important for **wildlife corridors and species migration routes**.
7. Faces threats from **encroachment and habitat degradation**.

8. Integral to **Kaziranga landscape-level biodiversity conservation strategy**.

KAZIRANGA ELEVATED CORRIDOR PROJECT

Recent Update: 35 km elevated highway planned through Kaziranga landscape

About

1. **Kaziranga Elevated Corridor Project** is a **35 km eco-sensitive infrastructure project in Assam**.
2. Built along **National Highway 715** connecting **Kaliabor and Numaligarh**.
3. Designed to ensure **safe wildlife movement across Kaziranga National Park**.
4. Protects **one-horned rhinoceros population, the largest in the world**.
5. Minimises **road accidents involving wildlife during floods and migrations**.
6. Incorporates **environmentally sensitive design principles**.
7. Balances **infrastructure development with ecological conservation**.
8. Represents **sustainable transport planning in biodiversity hotspots**.

KALAI-II HYDROELECTRIC PROJECT

Recent Update: Environmental clearance concerns due to biodiversity impact

About

1. **Kalai-II Hydroelectric Project** is a **1,200 MW run-of-river project in Arunachal Pradesh**.
2. Located on the **Lohit River, a tributary of Brahmaputra**.
3. Developed by **THDC India Limited**.
4. Designed with **pondage for short-term water storage**.
5. Aims to enhance **renewable energy generation capacity**.
6. Raises concerns about **impact on fragile Himalayan ecosystems**.
7. May affect **riverine biodiversity and endangered species habitats**.
8. Highlights need for **balancing energy security with ecological sustainability**.

SALAL HYDROELECTRIC PROJECT

Recent Update: Government directed sediment removal for safety concerns

About

1. **Salal Hydroelectric Project** is a **690 MW run-of-river project in Jammu & Kashmir**.
2. Built on the **Chenab River**.
3. Developed and operated by **NHPC Limited**.
4. First hydropower project built under **Indus Water Treaty framework**.
5. Faces issues of **sedimentation affecting reservoir efficiency**.
6. Important for **regional power supply and grid stability**.
7. Requires **regular maintenance and sediment management**.
8. Demonstrates challenges in **sustainable hydropower management**.

VISHNUGAD PIPALKOTI HYDRO ELECTRIC PROJECT

Recent Update: Continued development with World Bank funding

About

1. **Vishnugad Pipalkoti Project (VPHEP)** is a **run-of-river hydropower project in Uttarakhand**.
2. Located on the **Alaknanda River, a tributary of the Ganga**.
3. Developed by **THDC India Limited**.
4. Sanctioned in **2011 with World Bank financial support**.
5. Aims to boost **clean energy generation capacity**.
6. Raises concerns about **seismic risks and ecological fragility of Himalayas**.
7. May impact **river ecology and local livelihoods**.
8. Reflects debates on **hydropower vs environmental sustainability**.

BARGI DAM

Recent Update: National Dam Safety Authority issued notice over safety concerns

About

1. **Bargi Dam** is a **multi-purpose dam on the Narmada River in Madhya Pradesh**.

2. Part of the **Narmada Valley Development Project**.
3. Used for **irrigation, hydropower, and water supply**.
4. Regulated under **Dam Safety Act, 2021**.
5. Faces concerns over **structural safety and maintenance issues**.
6. Important for **agricultural productivity in central India**.
7. Requires **periodic inspection and risk assessment**.
8. Highlights need for **robust dam safety governance in India**.

BOMB CYCLONE

Recent Update: Bomb cyclone impacted northern United States

About

1. **Bomb cyclone (Bombogenesis)** is a **rapidly intensifying mid-latitude cyclone**.
2. Defined by **pressure drop of at least 24 millibars within 24 hours**.
3. Occurs mostly over **oceans in temperate regions**.
4. Can be **tropical or non-tropical** in nature.
5. Associated with **extreme weather events like blizzards and heavy rainfall**.
6. Driven by **temperature contrasts and atmospheric instability**.
7. Increasing frequency linked to **climate variability**.
8. Important for **weather forecasting and disaster preparedness**.

SIBERIAN HIGH

Recent Update: Continued influence on winter temperatures in North India

About

1. **Siberian High** is a **cold, dry high-pressure system dominating Eurasian winters**.
2. Centred near **Lake Baikal in Siberia**.
3. Formed due to **intense radiative cooling of landmass**.
4. Drives **cold northerly winds toward India**.

5. Contributes to **cold wave conditions in North India**.
6. Strength varies with **El Niño–La Niña cycles**.
7. Shallow system extending up to **~3,000 meters altitude**.
8. Plays key role in **winter monsoon and climatic patterns in Asia**.

NATIONAL ENVIRONMENTAL STANDARD LABORATORY (NESL)

Recent Update: India established world's second NESL in New Delhi

About

1. **NESL** is a **national reference laboratory for environmental monitoring systems**.
2. Established by **CSIR–National Physical Laboratory (NPL)**.
3. Located in **New Delhi**.
4. Tests and validates **air pollution monitoring instruments**.
5. Provides **industrial emission audits and calibration services**.
6. Supports **smart city air quality monitoring networks**.
7. Enhances **accuracy and reliability of environmental data**.
8. Strengthens India's **pollution control and environmental governance framework**.

UNFCCC

Recent Update: Continued global climate negotiations under COP framework

About

1. **UNFCCC (1992)** is an **international treaty addressing climate change**.
2. Adopted at **Rio Earth Summit (UNCED)**.
3. Aims to **stabilize greenhouse gas concentrations globally**.
4. Has **198 parties including India and EU**.
5. Headquarters located in **Bonn, Germany**.
6. Supported financially by **Global Environment Facility (GEF)**.
7. Annual **Conference of Parties (COP)** is the highest decision-making body.

8. Forms basis for **global climate agreements** like **Kyoto Protocol** and **Paris Agreement**.

SOURCE: DOWN TO EARTH

SUSTAINABLE AVIATION FUEL (SAF)

Recent Update: IOC secured India's first SAF certification at Panipat refinery

About

1. **Sustainable Aviation Fuel (SAF)** refers to **alternative liquid fuels replacing conventional jet fuel with lower lifecycle emissions**.
2. Produced from **used cooking oil (UCO), agricultural residues, municipal waste, and non-edible oils**.
3. Can contribute **~65% of aviation emission reductions by 2050** (IATA estimate).
4. India plans **1% blending by 2027, 5% by 2030, 15% domestic by 2040**.
5. Current strategy focuses on **co-processing SAF in existing refineries**.
6. Major constraint is **weak UCO collection and supply chain inefficiency**.
7. Linked to **public health benefits by preventing reuse of degraded cooking oil**.
8. Key initiative includes **RUCO programme by FSSAI for safe oil recycling**.

EU-MERCOSUR TRADE PACT

Recent Update: Agreement signed to create one of the largest free trade zones

About

1. **EU-Mercosur Trade Pact** is a **free trade agreement between EU and South American bloc Mercosur**.
2. Covers **~700 million consumers**, making it a major global trade bloc.
3. Mercosur includes **Argentina, Brazil, Paraguay, Uruguay (Bolivia joining)**.
4. Aims to **reduce tariffs on agriculture (Mercosur) and industrial goods (EU)**.
5. Includes **services, IP rights, environmental and labour standards**.
6. Impacts India by **increasing competition in agriculture and manufacturing exports**.

7. Strengthens EU's bargaining power in **India-EU FTA negotiations**.
8. Raises concerns over **critical minerals competition (lithium, rare earths)**.

BIODIVERSITY BEYOND NATIONAL JURISDICTION (BBNJ) TREATY

Recent Update: Entered into force as first global treaty for high seas biodiversity

About

1. **BBNJ Treaty (2023)** operates under **UNCLOS framework for high seas conservation**.
2. Covers **areas beyond national jurisdiction (~2/3 of oceans)**.
3. Addresses **overfishing, biodiversity loss, and governance gaps**.
4. Introduces **Marine Protected Areas (MPAs) on high seas**.
5. Regulates **Marine Genetic Resources (MGRs) and benefit sharing**.
6. Mandates **Environmental Impact Assessments (EIAs)**.
7. Promotes **capacity building and technology transfer for developing nations**.
8. Supports global target of **protecting 30% of oceans by 2030 (30x30 goal)**.

EMISSIONS TRADING SYSTEM (ETS)

Recent Update: Debate over ETS burden due to rising carbon prices

About

1. **ETS** is a **market-based mechanism to control emissions via cap-and-trade system**.
2. Governments set a **cap on emissions and issue tradable allowances**.
3. Each allowance equals **one tonne of CO₂ equivalent emissions**.
4. Firms can **buy/sell allowances, ensuring cost-efficient reductions**.
5. Encourages **innovation and cleaner technologies through carbon pricing**.
6. Example: **EU ETS covers ~40% of EU emissions**.
7. Challenges include **price volatility and carbon leakage risks**.

8. Increasingly integrated with **global climate policy frameworks**.

NIPAH VIRUS (NiV)

Recent Update: Cases detected in West Bengal after 19 years

About

1. **Nipah Virus (NiV)** is a **zoonotic RNA virus (Henipavirus family)**.
2. First identified in **Malaysia (1998–99)**.
3. Natural reservoir: **fruit bats (Pteropus species)**.
4. Transmission via **animals, contaminated food, and human-to-human contact**.
5. Causes **encephalitis and severe respiratory illness**.
6. High fatality rate of **40–75%**.
7. No approved **vaccine or specific antiviral treatment**.
8. Prevention relies on **surveillance, hygiene, and public health measures**.

EMISSIONS TRADING SYSTEM (ETS)

Recent Update: Increasing global expansion and policy integration

About

1. **ETS** caps emissions and allows **market trading of emission permits**.
2. Ensures **gradual reduction in total emissions over time**.
3. Promotes **cost-effective mitigation strategies**.
4. Supports **revenue generation for climate investments**.
5. Increasingly applied to **shipping, buildings, and aviation sectors**.
6. Requires **strong regulatory framework and monitoring systems**.
7. Faces issues of **equity and impact on developing economies**.
8. Key tool in achieving **net-zero emissions targets globally**.

INDIA'S DAIRY MODEL

Recent Update: India's dairy model discussed amid global trade and subsidy distortions

About

1. India follows a **cooperative dairy model (Amul-type)** based on farmer ownership and professional management.
2. It ensures **aggregation without displacement**, allowing even small farmers with 1–2 cattle to participate.
3. India produces **~25% of global milk**, making it the largest producer globally.
4. Promotes **inclusive growth, rural income stability, and poverty reduction**.
5. Strong role in **women empowerment**, as dairy labour is largely female-driven.
6. Based on **low external inputs and traditional agro-pastoral practices**, making it sustainable.
7. Supports **food and nutritional security** through affordable protein supply.
8. Acts as a model for **Atmanirbhar Bharat and economic resilience**.

PLASTIC LIFECYCLE & HUMAN HEALTH

Recent Update: Lancet study warns health burden may double by 2040

About

1. Plastic lifecycle includes **production → use → disposal → recycling/leakage stages**.
2. Health burden may rise to **4.5 million DALYs annually by 2040**.
3. Major drivers include **climate change (40%), air pollution (32%), toxic chemicals (27%)**.
4. Causes **respiratory diseases, endocrine disruption, and cancer risks**.
5. Microplastics enter **food chains and human body systems**.
6. Recycling alone is **insufficient; systemic transformation needed**.
7. Linked with **global climate goals and plastic treaty negotiations**.
8. India uses **Plastic Waste Rules + EPR framework for mitigation**.

DEEPFAKES & AI RISKS

Recent Update: Global AI safety report highlights rising misuse

About

1. **Deepfakes** are AI-generated **synthetic media** mimicking real individuals.
2. Created using **GANs and advanced AI models**.
3. Enable **misinformation, fraud, election manipulation, and cybercrime**.
4. Rapid rise due to **low cost and easy accessibility of AI tools**.
5. Threatens **democracy, cybersecurity, and internal security** in India.
6. Legal gaps exist despite **IT Act, DPDP Act, and IT Rules**.
7. Requires **AI governance, detection tools, and public awareness**.
8. Needs **global cooperation for regulation and standards**.

MENSTRUAL HEALTH AS A FUNDAMENTAL RIGHT

Recent Update: Supreme Court recognises menstrual health under Article 21

About

1. Recognised as part of **Right to Life, dignity, health, and sanitation (Article 21)**.
2. Mandates **functional, gender-segregated school toilets**.
3. Addresses **health risks like infections due to poor hygiene**.
4. Tackles **social stigma and cultural taboos**.
5. Linked to **education—20–23 million girls drop out annually**.
6. Supported by **NFHS-5 data showing improvement but disparities persist**.
7. Requires **infrastructure, awareness, and free sanitary products**.
8. Aligns with **SDGs 3, 4, 5, and 6**.

16TH FINANCE COMMISSION

Recent Update: Recommendations accepted for 2026–31 period

About

1. Constitutional body under **Article 280** to recommend tax devolution.
2. Retained **41% vertical devolution to states**.
3. Introduced **GDP-based criterion in horizontal distribution**.

4. No **revenue deficit grants for first time** → fiscal discipline shift.
5. Strong focus on **ecological federalism (forest criteria expansion)**.
6. ₹7.91 lakh crore allocation to **local bodies (82% increase)**.
7. Disaster financing includes **heatwaves, lightning, forest fires**.
8. Promotes **urbanisation incentives and governance reforms**.

INDIA–EU FREE TRADE AGREEMENT (FTA)

Recent Update: Agreement signed after two decades; operational by 2027

About

1. Covers **~2 billion population; one of largest trade deals globally**.
2. India gains **99% tariff-free access for exports**.
3. EU gains access to **industrial goods and services markets in India**.
4. Protects **sensitive sectors like dairy, cereals, poultry**.
5. Includes **TRQs and safeguard mechanisms**.
6. Addresses **CBAM challenges and decarbonisation cooperation**.
7. Boosts **EV, clean energy, and manufacturing sectors**.
8. Represents **strategic alignment in geopolitics and trade diversification**.