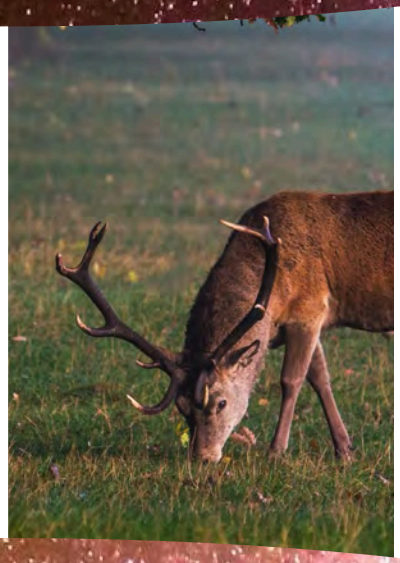
PadhAI

GET IT ON Google Play



Down to *Earth*

SUMMARY FOR UPSC — MAGAZINE

16-30TH APRIL 2026

Welcome to PadhAI–

Down to Earth Magazine Coverage

You're here because you understand a core truth of UPSC preparation—success doesn't come from reading everything, but from reading what actually matters.

Down to Earth is one of the most valuable sources for environment, ecology, and sustainable development. However, reading it cover to cover can be time-consuming and often difficult to align directly with exam demands. PadhAI's Down to Earth coverage is designed to simplify that process—by filtering, structuring, and converting important content into exam-ready insights.

Why PadhAI's Down to Earth Coverage

Many aspirants struggle with Down to Earth because of:

- Detailed and lengthy articles
- Indirect linkage with Prelims and Mains
- Difficulty in extracting core concepts and usable points

At PadhAI, we focus only on what is relevant. We identify key themes, connect them with syllabus requirements, and align them with PYQs to ensure conceptual clarity and answer-writing utility.

Every topic included:

- Has clear relevance to GS (especially GS-3: Environment) or Essay
- Is linked directly or indirectly with previous year questions
- Enhances your understanding of environmental issues, policies, and analysis

Nothing is included for the sake of volume. Everything is included for value.

Part of the PadhAI Preparation Ecosystem

This Down to Earth coverage is integrated with a broader system that includes:

- **Fast and concise magazines (published early)**
- **Daily PIB summaries (filtered and exam-focused)**
- **Monthly compliance coverage**
- **Complete Prelims & Mains PYQs with structured answers**
- **News summaries from relevant sources**
- **Personal tutor chat support for continuous guidance**

The goal is simple:
One reliable system instead of multiple scattered sources.

Our Guiding Philosophy

At PadhAI, everything is built on three principles:

- **Learn only what matters**
- **Learn it the right way**
- **Learn it at the right time**

That's how preparation becomes focused, efficient, and effective.

Topic 1: Illegal Sand Mining in National Chambal Wildlife Sanctuary

Summary: The Supreme Court-appointed Central Empowered Committee (CEC) has flagged rampant illegal sand mining within the National Chambal Wildlife Sanctuary (NCWS), spanning Rajasthan, Madhya Pradesh, and Uttar Pradesh. This ecological crisis is driven by governance failures, including weak inter-state coordination and the unauthorised denotification of forest areas.

Background: Notified for the conservation of critically endangered species like the Gharial, the NCWS is a tri-state protected area and a recognised Important Bird Area (IBA). Despite legal protections under the Wildlife Protection Act, 1972, enforcement of Eco-Sensitive Zone (ESZ) norms has remained ineffective.

Key Points:

- **Biodiversity Threat:** Illegal mining destroys the essential sandbanks used as nesting sites by gharials and turtles, while also disturbing habitats for Gangetic river dolphins and the Indian skimmer.

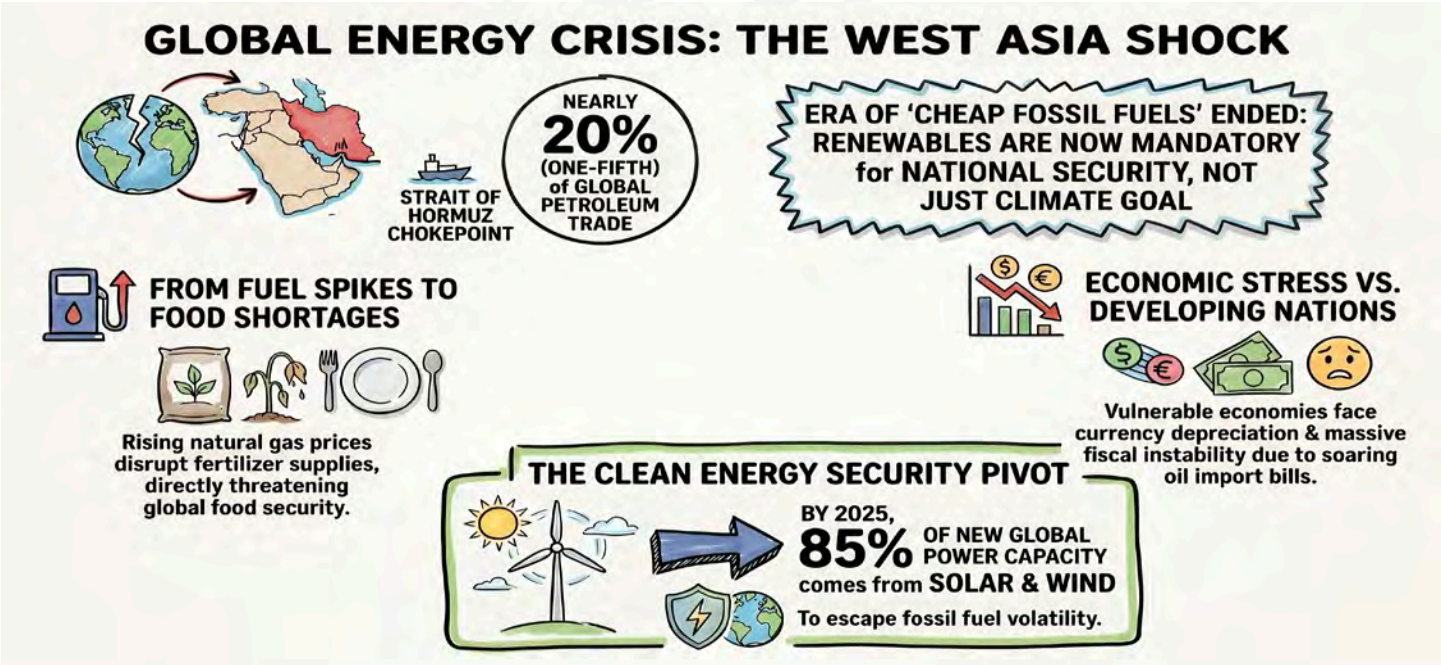
- **River Ecology Degradation:** Constant extraction alters river flow and sediment balance, leading to increased erosion and habitat fragmentation within the sanctuary.
- **Regulatory Failure:** The CEC noted that states have denotified forest areas without central approval, facilitating extraction despite existing environmental laws.

Prelims Facts (One Liners):

- National Chambal Wildlife Sanctuary is a tri-state protected area managed by Rajasthan, Madhya Pradesh, and Uttar Pradesh.
- The sanctuary is specifically notified for the conservation of the critically endangered Gharial (*Gavialis gangeticus*).

MCQ Practice: Q. The National Chambal Wildlife Sanctuary is primarily notified for the conservation of which critically endangered species? A) Bengal Tiger B) One-horned Rhinoceros C) Gharial D) Snow Leopard **Answer: C** (The NCWS is a vital habitat for the critically endangered Gharial and the endangered Gangetic dolphin.)

Topic 2: Global Energy Crisis Amid Conflict in West Asia



Summary: Ongoing geopolitical conflicts involving the US, Israel, and Iran have triggered a global energy crisis, disrupting critical supply routes through maritime chokepoints like the Strait of

Hormuz. This has resulted in fuel rationing, rising inflation, and increased trade deficits, disproportionately impacting vulnerable populations in developing countries.

Background: Even before the conflict, a global transition toward clean energy was underway, with renewables accounting for ~50% of installed electricity capacity by 2025. The current crisis is now reframing renewable energy not just as a climate goal, but as a necessity for energy security and economic resilience.

Key Points:

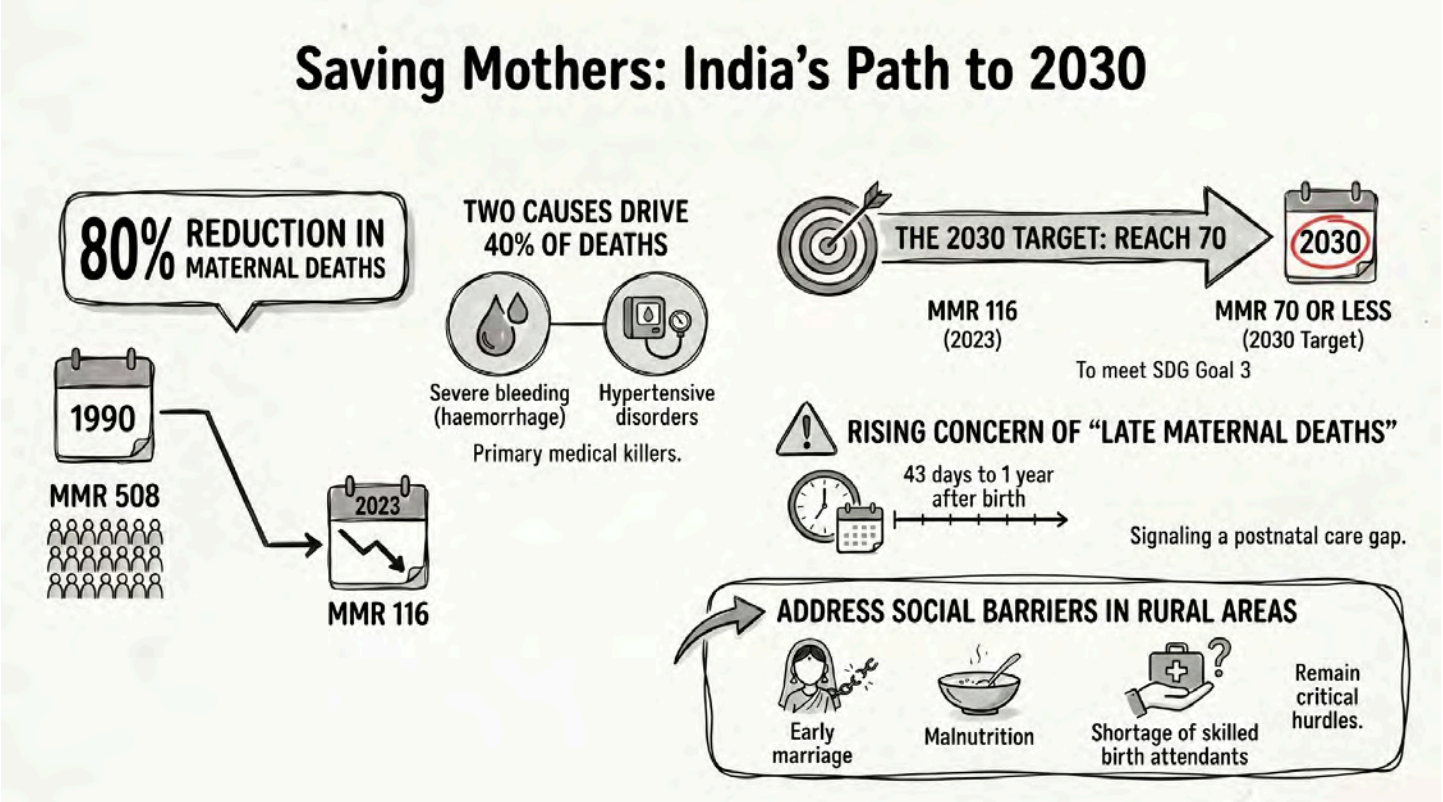
- **Socio-Economic Impacts:** Rising LPG and fuel prices strain household incomes, while fertiliser supply disruptions (linked to natural gas) threaten global food security.
- **Macroeconomic Stress:** Developing economies face currency depreciation and fiscal instability as oil import bills worsen current account deficits.
- **Structural Shifts:** The crisis may signal the end of the "cheap fossil fuel era," accelerating energy nationalism and the restructuring of energy technology supply chains.

Prelims Facts (One Liners):

- The Strait of Hormuz handles approximately 20% of the world's global petroleum trade.
- By 2025, approximately 85% of new global power capacity additions were from solar and wind sources.

MCQ Practice: Q. What percentage of global petroleum trade historically passes through the Strait of Hormuz? A) 5% B) 10% C) 20% D) 50% **Answer: C** (The Strait is a critical chokepoint affecting one-fifth of global oil flows.)

Topic 3: Maternal Mortality in India and the World



Summary: Findings from the Global Burden of Disease (GBD) 2023 Study reveal that India has reduced its MMR by nearly 80%, from 508 in 1990 to 116 in 2023. Despite this success, India still records the second-highest absolute number of maternal deaths globally, indicating persistent regional disparities and health system gaps.

Background: Maternal mortality refers to death during pregnancy or within 42 days of termination; it is a core indicator for SDG Goal 3. Progress in India is attributed to improvements in institutional deliveries and government schemes like Janani Suraksha Yojana (JSY).

Key Points:

- **Major Medical Causes:** Severe bleeding (haemorrhage) and hypertensive disorders account for over 40% of maternal deaths globally.
- **Late Maternal Deaths:** A rising concern is "late maternal deaths" (43 days to 1 year after childbirth), which increased from 1.3% in 1990 to 3.2% in 2023, indicating gaps in postnatal care.

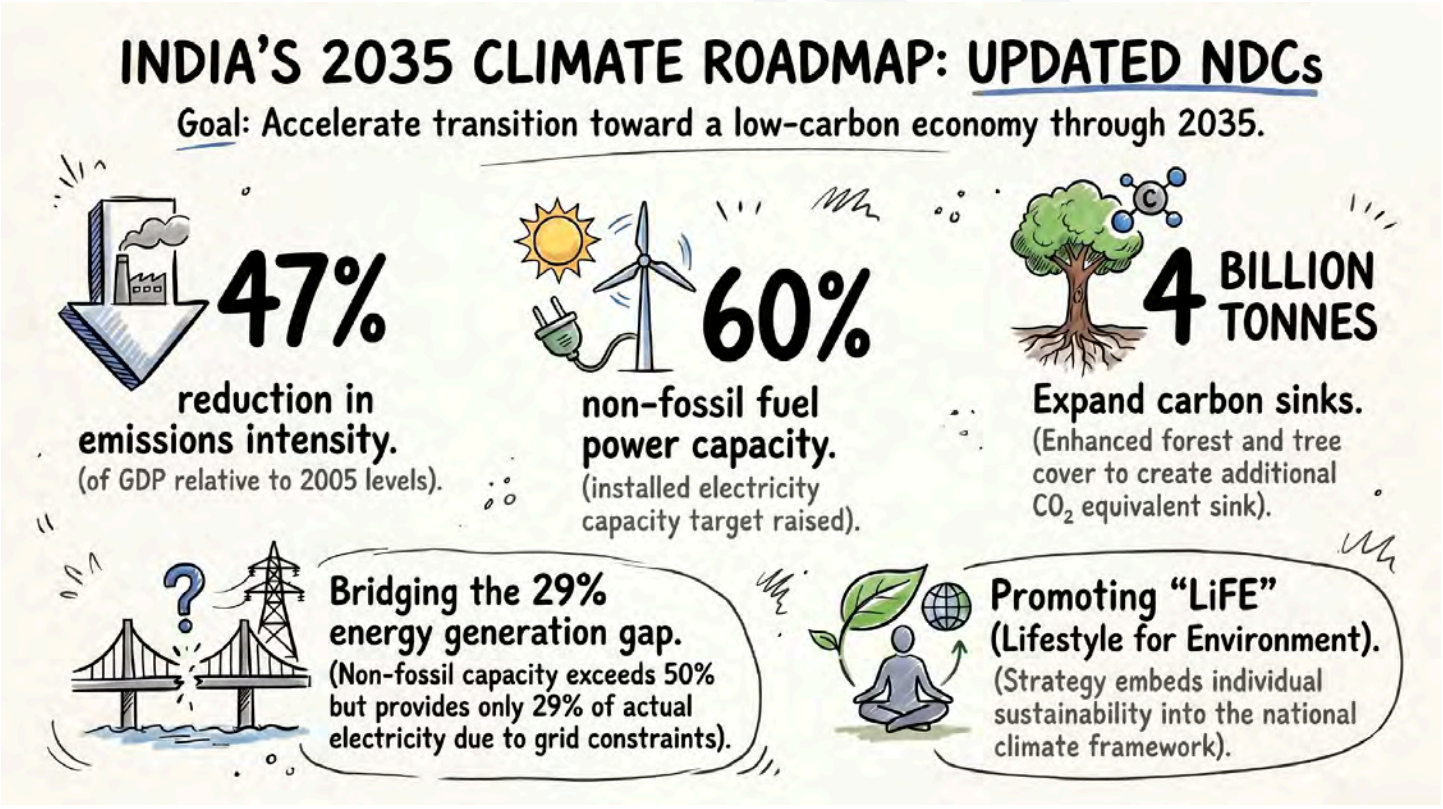
- **Social Determinants:** Early marriage, malnutrition, and a shortage of skilled birth attendants in rural areas remain significant structural challenges.

Prelims Facts (One Liners):

- India's Maternal Mortality Ratio (MMR) was recorded at 116 per 100,000 live births in 2023.
- The SDG target for global MMR is to reach less than or equal to 70 by the year 2030.

MCQ Practice: Q. According to the GBD 2023 study, which two medical causes account for over 40% of maternal deaths worldwide? A) Malaria and Pneumonia B) Haemorrhage and Hypertensive disorders C) Diabetes and Stroke D) Accidents and Malnutrition **Answer: B** (Severe bleeding and hypertensive disorders remain the leading medical drivers of maternal mortality.)

Topic 4: India's Updated Climate Commitments (NDCs) for 2035



Summary: India has updated its Nationally Determined Contributions (NDCs) for 2035, marking its third submission to the UNFCCC under the Paris Agreement. These targets aim to balance

decarbonisation with national development, focusing on reducing emissions intensity rather than absolute emission cuts.

Background: The update follows the first Global Stocktake (2023), which warned that the world is currently off track to limit warming to 1.5°C. India's strategy embeds sustainability through the promotion of Lifestyle for Environment (LiFE).

Key Points:

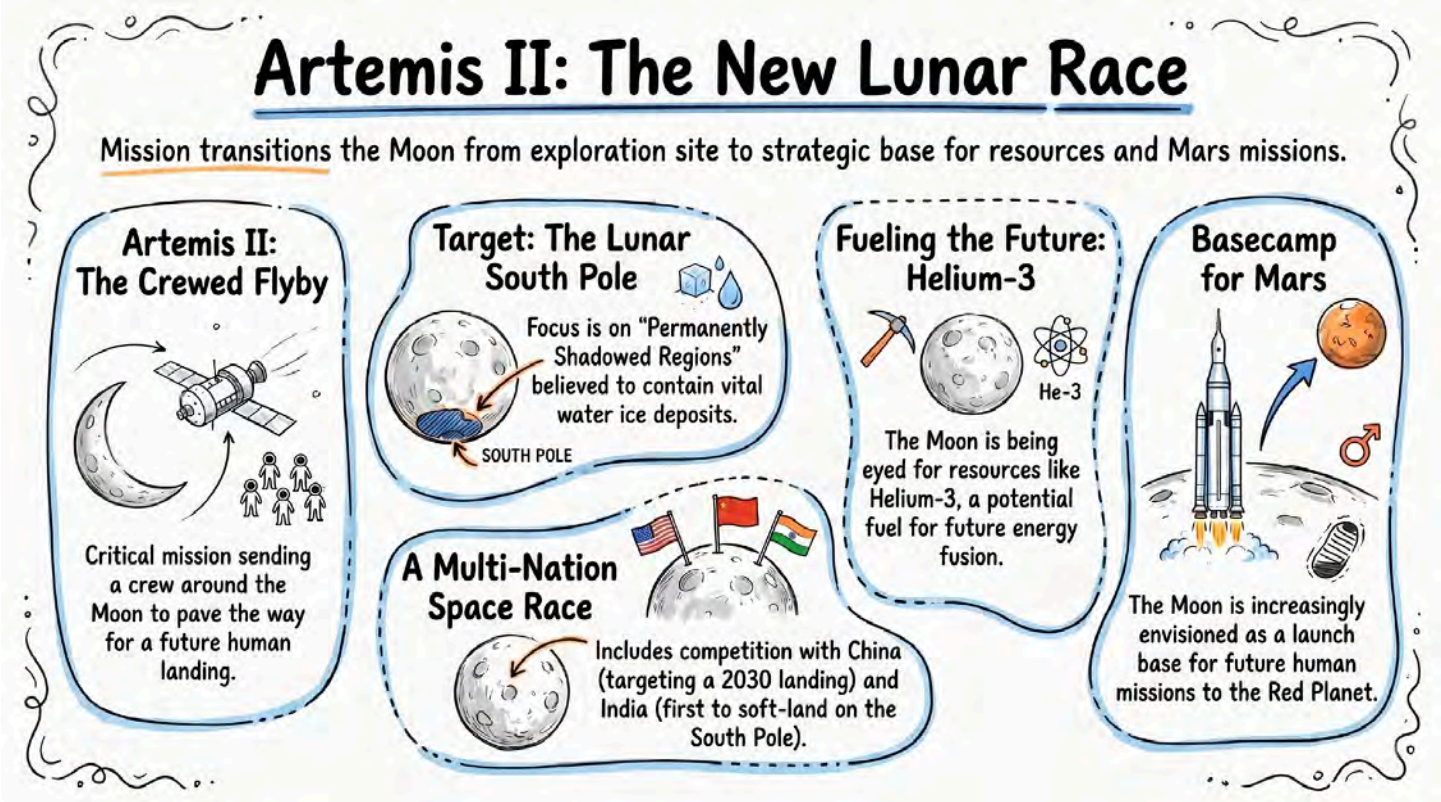
- **Key 2035 Targets:** India aims to reduce emissions intensity of GDP by 47% from 2005 levels and achieve 60% installed power capacity from non-fossil sources.
- **Carbon Sink Expansion:** The goal is to create an additional 3.5–4 billion tonnes of CO_2 equivalent carbon sink through enhanced forest and tree cover.
- **Energy Generation Gap:** While non-fossil sources make up over 50% of installed capacity, they currently contribute only about 29% of actual electricity generation due to grid constraints and intermittency.

Prelims Facts (One Liners):

- India's updated NDC target for 2035 is to achieve 60% of installed power capacity from non-fossil fuel sources.
- The emissions intensity reduction target for 2035 is set at 47% from 2005 levels.

MCQ Practice: Q. Under the updated NDCs for 2035, what is India's target for installed power capacity from non-fossil fuel sources? A) 40% B) 50% C) 60% D) 70% **Answer: C** (The target has been increased from the earlier 50% by 2030 to 60% by 2035.)

Topic 5: Artemis II and the New Lunar Race



Summary: NASA's Artemis II mission marks a return to deep-space exploration, aiming for a crewed lunar flyby to pave the way for a future human landing. The mission focuses on the Lunar South Pole, a region believed to contain significant water ice deposits in Permanently Shadowed Regions (PSRs).

Background: This new race involves intense competition between the US, China, and India, with China targeting a crewed landing by 2030. The Moon is increasingly envisioned as a base for launch operations for future missions to Mars.

Key Points:

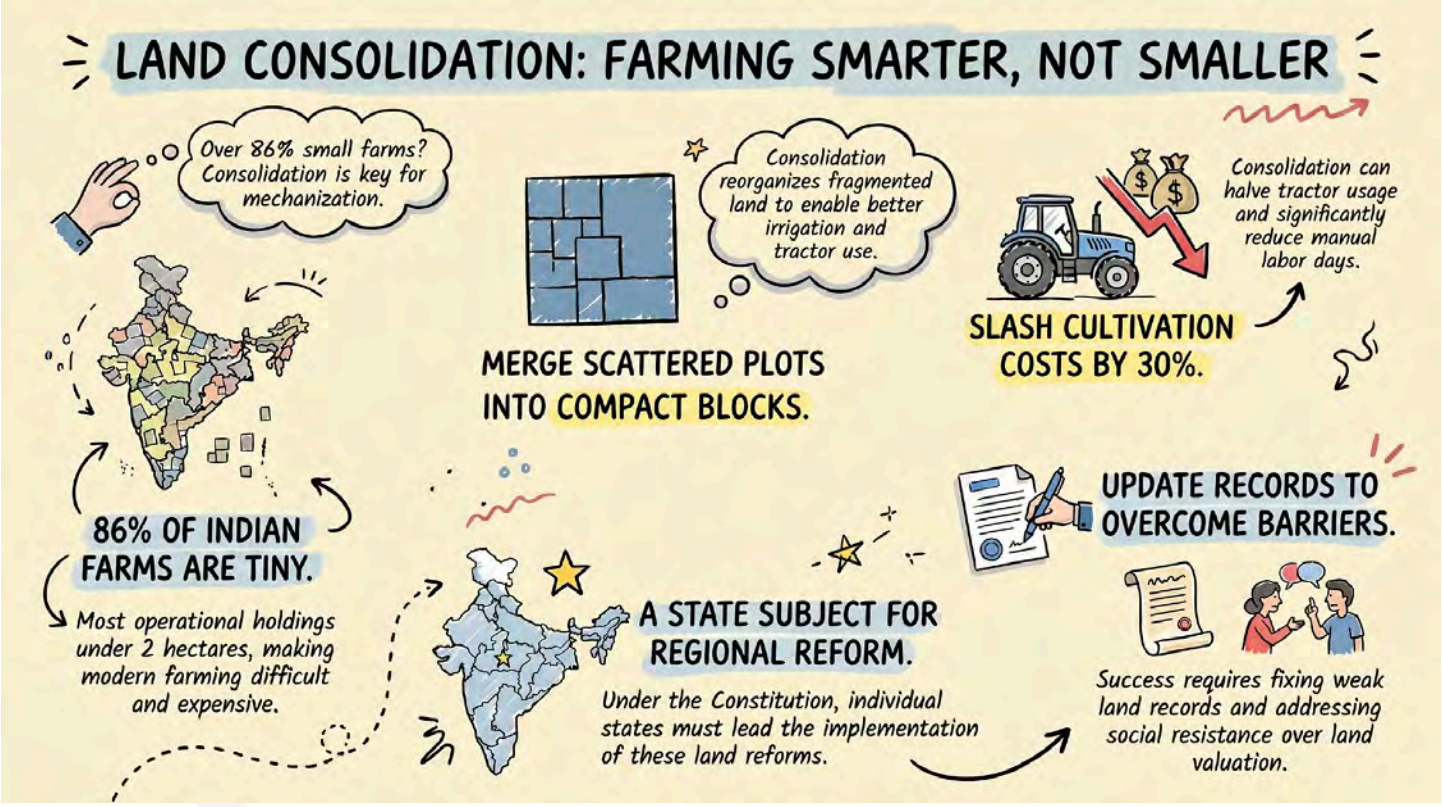
- **Scientific Objectives:** Artemis II will enhance detection of lunar geological features like crater rims and ridges to better understand lunar evolution.
- **Resource Competition:** Strategic interest in lunar resources like Helium-3 (potential fusion fuel) and water ice has raised concerns about future economic exploitation.
- **International Law:** Space activities are governed by the Outer Space Treaty (1967), which promotes peaceful use and prohibits weapons of mass destruction in space.

Prelims Facts (One Liners):

- Artemis II is a crewed lunar flyby mission, serving as a precursor to the Artemis III landing mission.
- ISRO's Chandrayaan-3 (2023) was the first mission to successfully soft-land on the south pole of the Moon.

MCQ Practice: Q. Which mission became the first to successfully soft-land on the South Pole of the Moon in 2023? A) Apollo 11 B) Chandrayaan-3 C) Artemis I D) Chang'e 4 **Answer: B** (ISRO's Chandrayaan-3 made history by reaching the lunar south pole in 2023.)

Topic 6: Land Consolidation in India: Key to Agrarian Reform



Summary: Land consolidation aims to reorganise fragmented agricultural holdings into compact blocks to improve efficiency, reduce costs, and enhance productivity. Despite proven benefits—such as a 30% reduction in cultivation costs observed in Rajasthan—implementation remains uneven across Indian states.

Background: Land is a State Subject under Entry 18 of the State List; states like Punjab and Haryana successfully used consolidation as a foundation for the Green Revolution. Currently, 86.2% of India's operational holdings are small and marginal (<2 ha), highlighting the urgency for reform.

Key Points:

- **Approaches:** Implementation can be "voluntary" (based on full consent) or "majority-based" (faster but prone to disputes).
- **Documented Benefits:** Field studies show that consolidation can reduce tractor use by 50% and labour requirements from 220 to 140 days per year.
- **Implementation Barriers:** Challenges include weak land records, corruption in the revenue department, and social resistance over land valuation.

Prelims Facts (One Liners):

- Land is a State Subject under Entry 18 of the State List of the Seventh Schedule of the Indian Constitution.
- The average landholding in India declined to approximately 0.74 hectares by 2021–22.

MCQ Practice: Q. According to the Agriculture Census 2021–22, what percentage of India's operational holdings are small and marginal (<2 ha)? A) 50.5% B) 68.2% C) 86.2% D) 92.4%
Answer: C (Small and marginal farmers constitute the overwhelming majority of landholders in India.)

Topic 7: Climate Finance: Ambition vs Delivery

Summary: Climate finance remains a critical bottleneck, with actual funding for vulnerable communities often being scarce, delayed, or inaccessible. Despite trillions being projected, only about 15% of the required finance for developing nations is currently being met.

Background: COP30 (2025) emphasized scaling finance but failed to provide binding commitments, deepening a credibility crisis. Currently, mitigation projects dominate global flows, while adaptation remains underfunded.

Key Points:

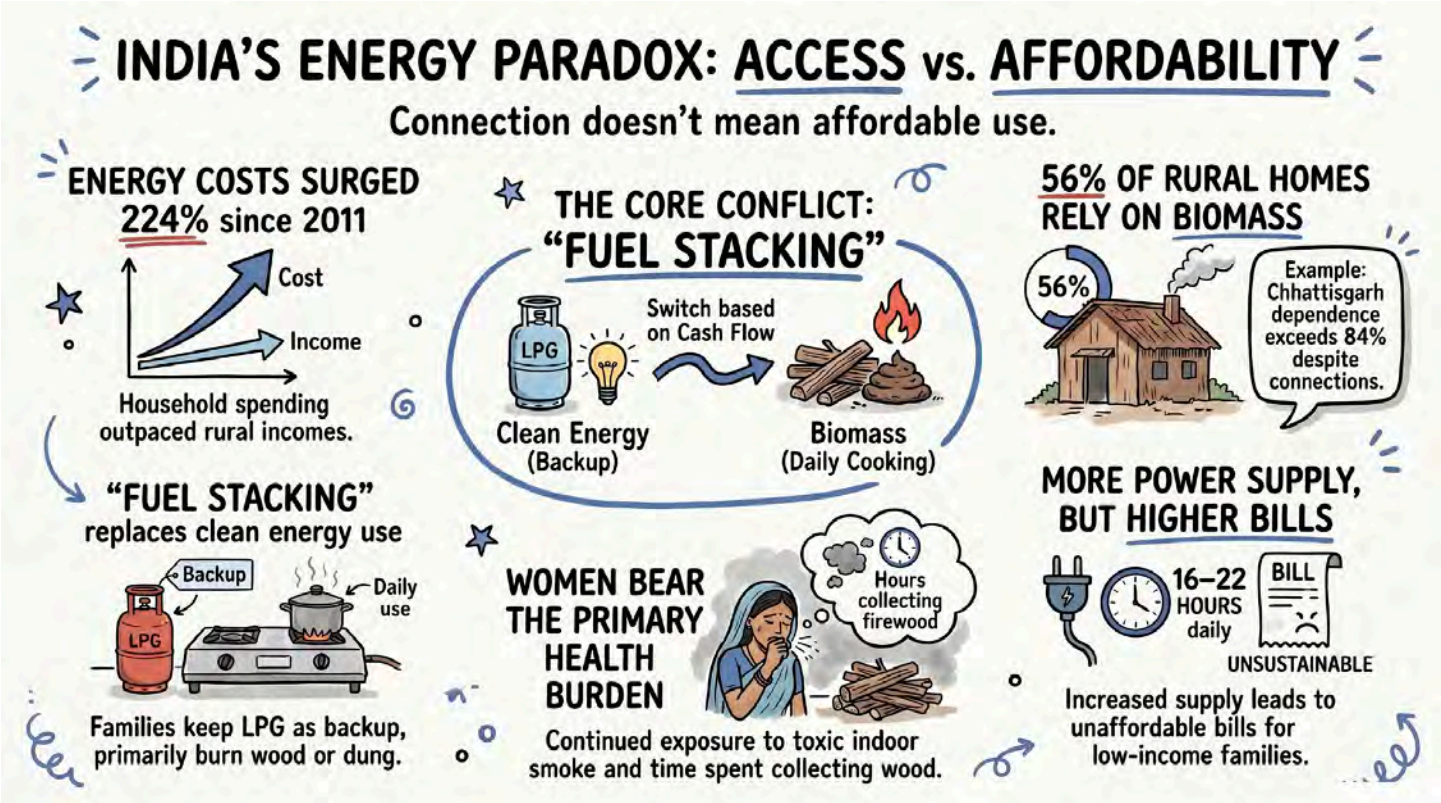
- **Mitigation Dominance:** Roughly 90% of global climate finance is directed toward mitigation (e.g., renewables) because it generates revenue and attracts private investment.
- **Adaptation Underfunding:** Adaptation receives less than 10% of total finance, despite evidence that it offers a benefit-cost ratio of 4:1 or higher (e.g., cyclone shelters).
- **The MDB Role:** Multilateral Development Banks (MDBs) are seen as central to shifting from project-based to system-level financing by providing guarantees and concessional lending.

Prelims Facts (One Liners):

- Adaptation finance currently accounts for less than 10% of total global climate finance.
- The "Loss and Damage Fund" had only approximately $700 million pledged as of 2026.

MCQ Practice: Q. What is the estimated benefit-cost ratio for investments in climate adaptation projects like cyclone shelters? A) 1:1 B) 2:1 C) ≥ 4:1 D) 10:1 **Answer: C** (Adaptation provides high returns by reducing disaster losses and fiscal shocks.)

Topic 8: Rural India's Energy Paradox: Access without Affordability



Summary: While energy access in rural India has expanded through electrification and LPG connections, affordability remains a persistent barrier. This has created an "energy paradox" where households engage in "fuel stacking"—using both LPG and traditional biomass depending on their current cash flow.

Background: Energy expenditure for rural households rose by over 224% between 2011 and 2024, far outpacing income growth. In states like Chhattisgarh, over 84% of rural households still depend on biomass.

Key Points:

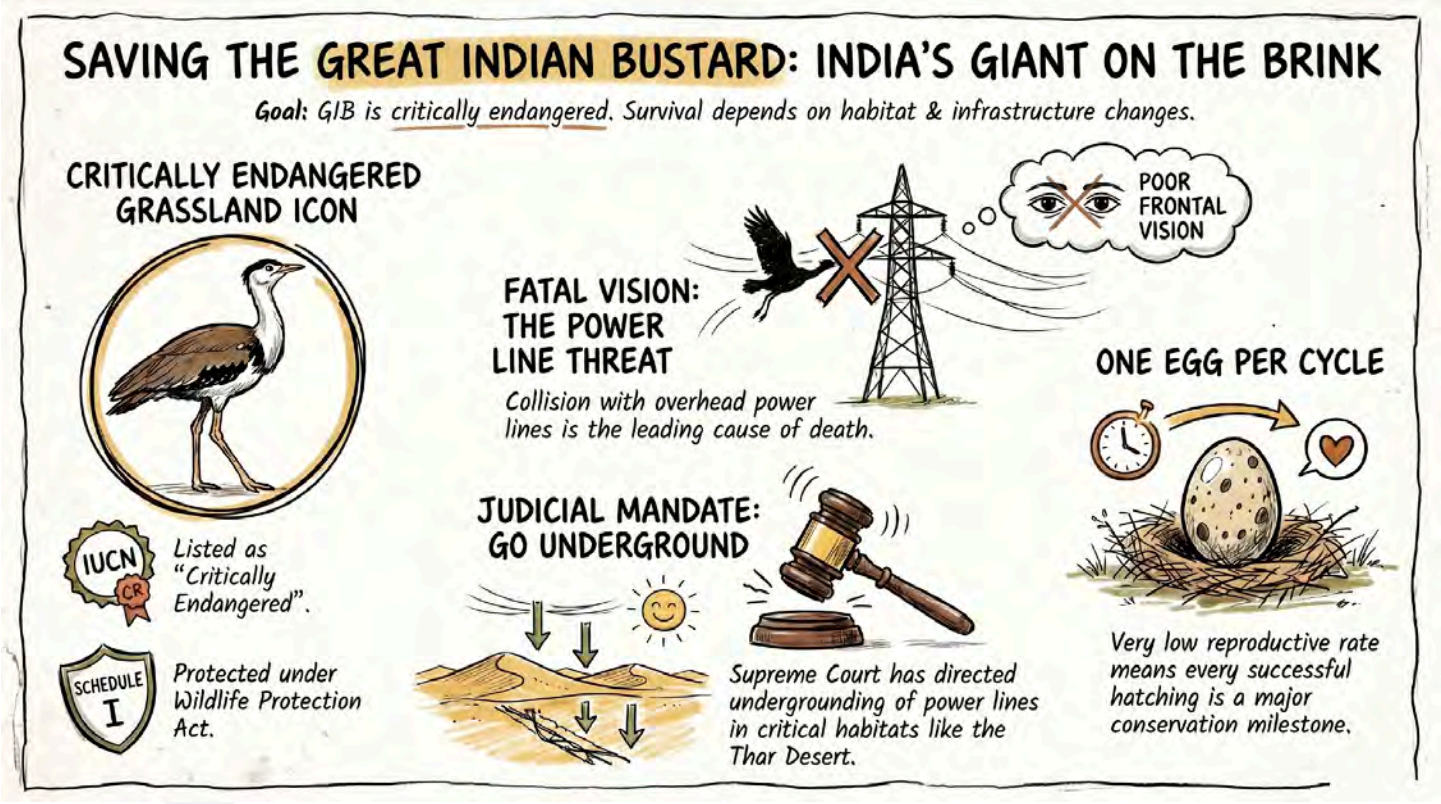
- **Market-Linked Pricing:** LPG and electricity prices are rising faster than rural incomes, squeezing budgets for nutrition and healthcare.
- **Gender Impacts:** Women in rural areas continue to spend significant time collecting firewood, and exposure to indoor smoke from biomass fuels remains a major health risk.
- **Electrification Paradox:** While supply has increased to 16–22 hours/day, higher usage of appliances has led to electricity bills that are difficult for low-income families to sustain.

Prelims Facts (One Liners):

- According to NFHS-5 (2019–21), approximately 56.1% of rural Indian households still rely on biomass for energy.
- Chhattisgarh has the highest state-level rural dependence on biomass for cooking, exceeding 84%.

MCQ Practice: Q. Which Indian state has the highest percentage (over 84%) of rural households relying on biomass for energy? A) Uttar Pradesh B) Madhya Pradesh C) Chhattisgarh D) Bihar **Answer: C** (Chhattisgarh shows the highest reliance on traditional fuels among the analysed states.)

Topic 9: Great Indian Bustard (GIB)



Summary: The successful hatching of a GIB chick in Gujarat's Kutch region marks a major conservation milestone for one of India's most endangered birds. Endemic to the Indian subcontinent, the GIB is a flagship species whose survival indicates the health of arid and semi-arid habitats.

Background: The species is listed as 'Critically Endangered' on the IUCN Red List and faces severe threats from habitat loss and power line collisions. It has a very low reproductive rate, laying only one egg per breeding cycle.

Key Points:

- **Fatal Power Lines:** Collision with overhead power transmission lines is the leading cause of mortality due to the bird's poor frontal vision.
- **Conservation Efforts:** "Project Great Indian Bustard" focuses on habitat protection and captive breeding programmes in Rajasthan and Gujarat.
- **Judicial Intervention:** The Supreme Court has issued directions for the undergrounding of power lines in critical GIB habitats.

Prelims Facts (One Liners):

- The Great Indian Bustard is listed as 'Critically Endangered' on the IUCN Red List and in Schedule I of the Wildlife (Protection) Act, 1972.
- The largest remaining population of GIB is found in the Thar Desert landscape of Rajasthan.

MCQ Practice: Q. What is the primary cause of mortality for the Great Indian Bustard in its natural habitat? A) Predators B) Lack of food C) Collision with overhead power lines D) Infectious disease **Answer: C** (Poor frontal vision makes these large birds highly susceptible to power line collisions.)

Topic 10: Beeraan Handicraft of Kabirdham

Summary: The *beeraan* garland of Chhattisgarh represents a unique intersection of tribal culture and biodiversity conservation. Worn during festivals like Dusshera, it is meticulously crafted by the Baiga tribe, a Particularly Vulnerable Tribal Group (PVTG).

Background: The craft relies on indigenous ecological knowledge, using specific grasses and trees found naturally in and around millet fields.

Key Points:

- **Traditional Crafting:** The garland consists of 60–80 small rings made from *sutakhar* grass (vetiver), which grows naturally in millet fields.
- **Natural Materials:** Fibers for the garland are derived from the bark of the parijat tree (*Nyctanthes arbor-tristis*).
- **Sustainable Livelihood:** The process requires high skill and patience, providing a culturally rooted income source for tribal communities.

Prelims Facts (One Liners):

- *Beeraan* is a traditional tribal garland associated with the Baiga tribe of Chhattisgarh.
- The Baiga tribe is officially recognised as a Particularly Vulnerable Tribal Group (PVTG) in India.

MCQ Practice: Q. The traditional *beeraan* garland is primarily associated with which Particularly Vulnerable Tribal Group (PVTG)? A) Gond B) Baiga C) Santhal D) Jarawa **Answer: B** (The Baiga tribe of Kabirdham district holds the unique ecological knowledge for this craft.)

Topic 11: CMS COP15 (Brazil, 2026)

Summary: The 15th Conference of Parties (COP15) to the Convention on the Conservation of Migratory Species (CMS) concluded in Brazil, marking a major step in global biodiversity governance. The conference added 40 new species, including the Cheetah and Snowy owl, to the protected lists.

Background: Also known as the Bonn Convention (1979), the CMS operates under the UNEP to conserve migratory species across international borders. India has been a party since 1983 and hosted COP13 in Gandhinagar.

Key Points:

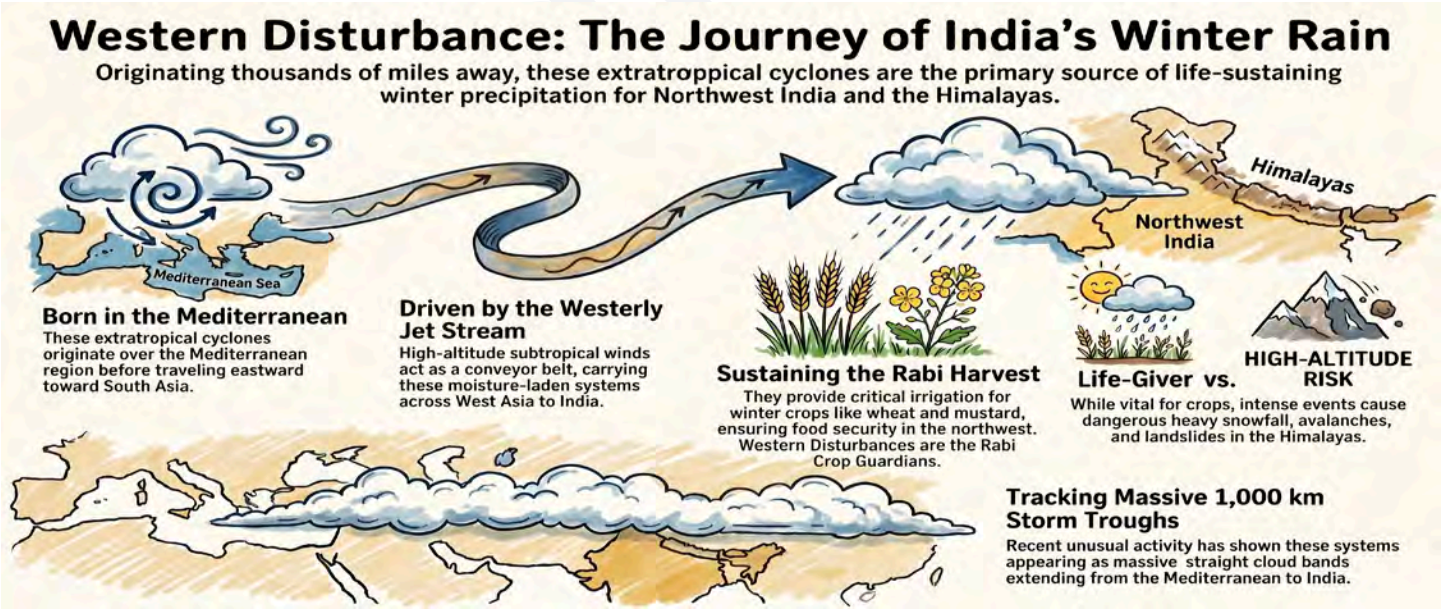
- **New Global Initiative:** A "Global Initiative on the Taking of Migratory Species" was launched to address illegal and unsustainable removal of wildlife.
- **Drivers of Decline:** Major factors include overexploitation (hunting/fishing), habitat loss (wetland degradation), and the fragmentation of migratory corridors.
- **CMS Appendices:** Appendix I provides strict protection for endangered species, while Appendix II promotes international agreements for species with unfavourable status.

Prelims Facts (One Liners):

- The Secretariat of the CMS is located in Bonn, Germany.
- India hosted the CMS COP13 in 2020 at Gandhinagar, Gujarat.

MCQ Practice: Q. Under the CMS (Bonn Convention), which appendix includes migratory species that require international cooperation through formal agreements? A) Appendix I B) Appendix II C) Appendix III D) Appendix IV **Answer: B** (Appendix II species need collective international action to improve their conservation status.)

Topic 12: Western Disturbance



Summary: Western Disturbances (WDs) are eastward-moving extratropical cyclones embedded in the subtropical westerly jet stream. They originate over the Mediterranean region and serve as the primary source of winter precipitation for northwest India and the Himalayas.

Background: In early 2026, an unusual event occurred where a strong WD interacted with tropical systems, appearing as a straight 1,000 km trough rather than a typical curved system.

Key Points:

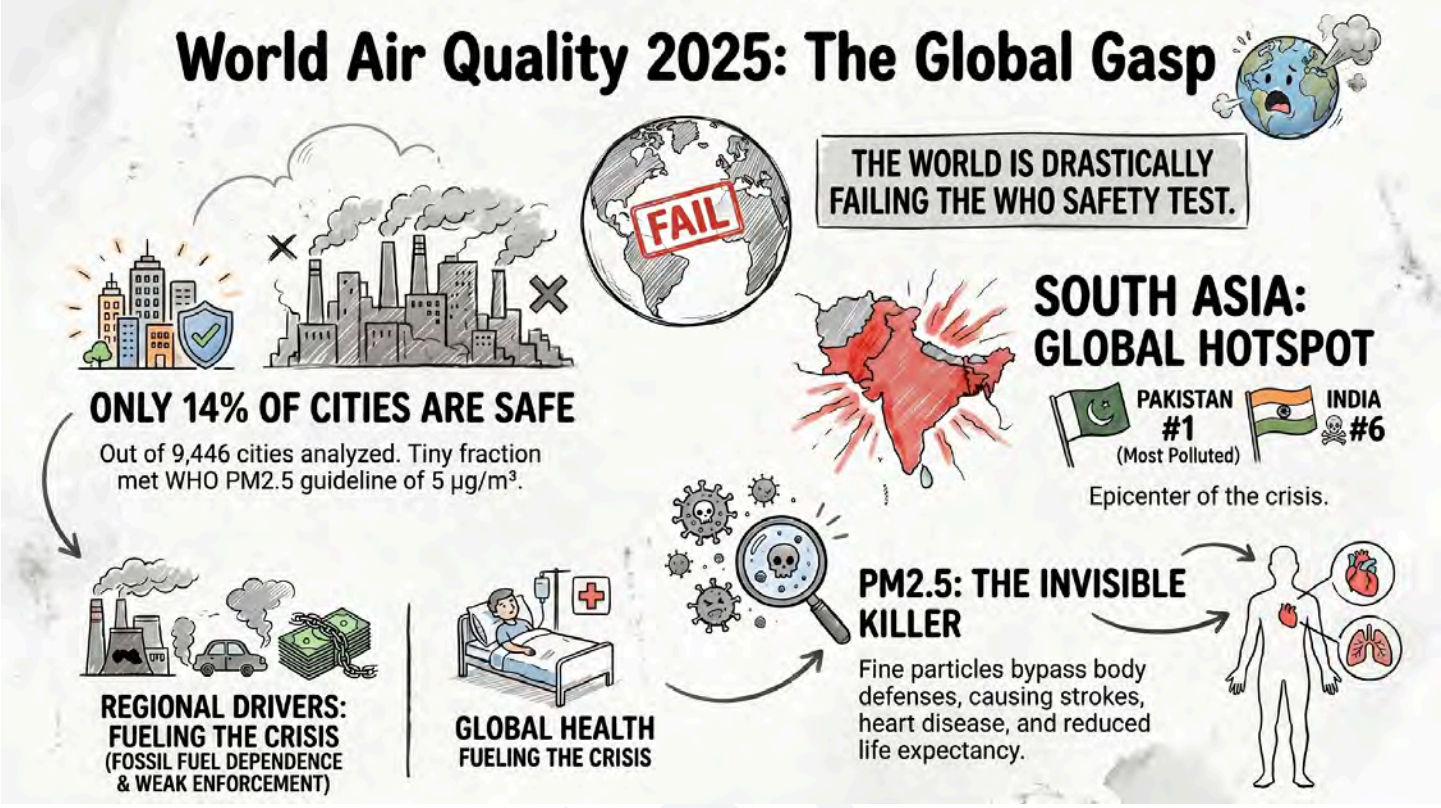
- **Seasonality:** Peak activity normally occurs from December to February; unseasonal WDs can trigger extreme weather in March and April.
- **Agricultural Impact:** They are crucial for maintaining rabi crops like wheat and mustard in northwestern India.
- **High-Altitude Risks:** Intense WD events can cause heavy snowfall, avalanches, and landslides in Himalayan states.

Prelims Facts (One Liners):

- Western Disturbances originate primarily over the Mediterranean region.
- They are carried eastward toward South Asia by the subtropical westerly jet stream.

MCQ Practice: Q. Where do Western Disturbances that bring winter rain to India primarily originate? A) Bay of Bengal B) Arabian Sea C) Mediterranean Region D) South China Sea **Answer: C** (WDs travel across West Asia into South Asia from the Mediterranean.)

Topic 13: World Air Quality Report 2025



Summary: The IQAir World Air Quality Report 2025 highlights a widespread global air pollution crisis, with South Asia remaining the primary hotspot. Pakistan was ranked as the most polluted country globally, while India ranked 6th.

Background: The report uses PM2.5 (fine particulate matter) as the core indicator, given its severe impacts on lung and heart health. Only 14% of 9,446 analysed cities met the stringent WHO safety guidelines.

Key Points:

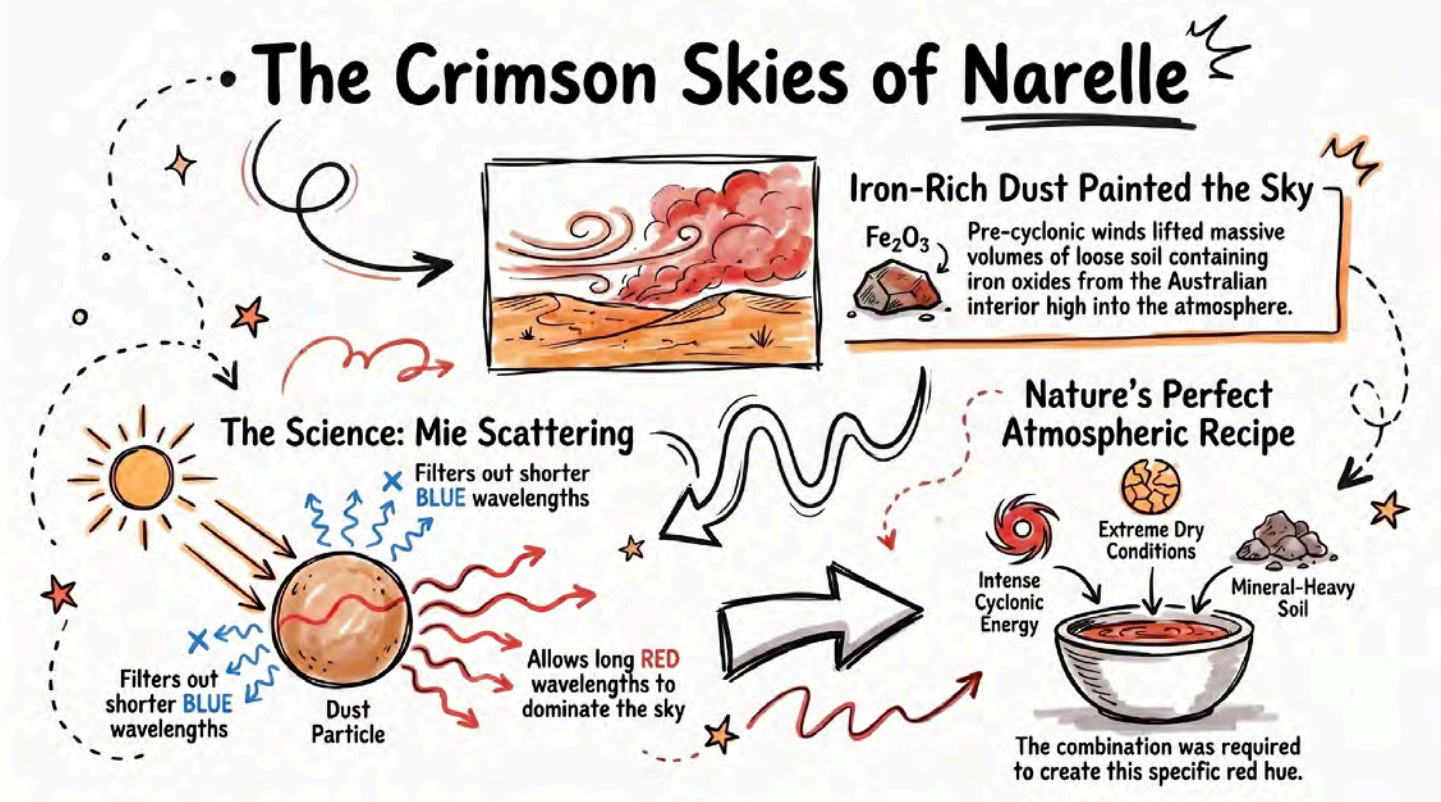
- **Regional Trends:** South Asia's pollution is driven by high population density, fossil fuel dependence, and weak enforcement of environmental standards.
- **India's Position:** India remains among the world's most polluted nations, with several Indian cities featuring in the top global rankings.
- **Health Impacts:** High PM2.5 levels are directly linked to reduced life expectancy, stroke, and chronic respiratory diseases.

Prelims Facts (One Liners):

- Pakistan was ranked as the most polluted country in the World Air Quality Report 2025.
- India ranked as the 6th most polluted country globally in 2025.

MCQ Practice: Q. According to the World Air Quality Report 2025, which country was ranked as the most polluted? A) India B) Bangladesh C) Pakistan D) China **Answer: C** (Pakistan recorded the highest average PM2.5 levels at 67.3 µg/m³.)

Topic 14: Tropical Cyclone Narelle



Summary: Tropical Cyclone Narelle triggered a rare atmospheric phenomenon where the sky over Western Australia turned a deep red. This was caused by strong pre-cyclonic winds lifting iron-rich dust particles into the atmosphere, which then scattered sunlight through a process called Mie Scattering.

Background: Dust aerosols rich in iron oxides (Fe_2O_3) are highly efficient at absorbing shorter wavelengths and allowing longer red wavelengths to dominate the sky.

Key Points:

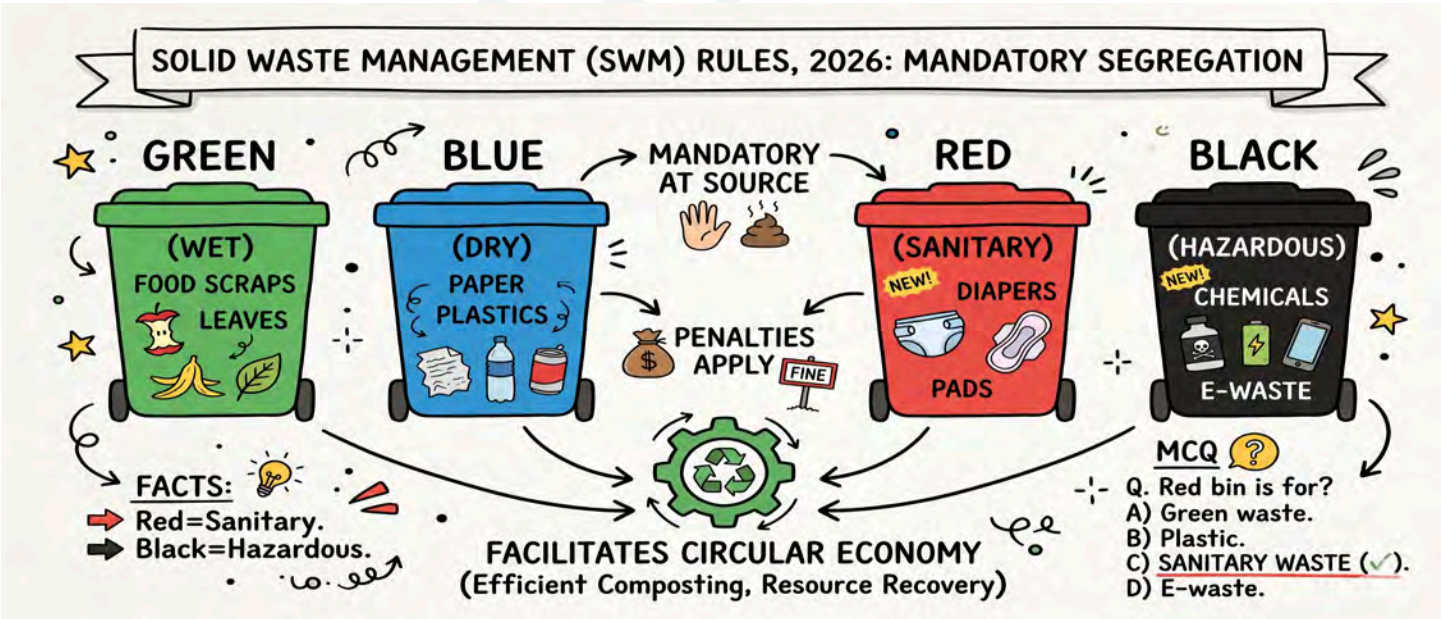
- **Mie Scattering:** Occurs when larger particles (like dust) in the atmosphere influence the colour of light.
- **Contributing Factors:** The intensity of the red hue was intensified by dry conditions and the specific mineral-rich soil of the Australian interior.
- **Winds:** The cyclonic system provided the necessary energy to lift massive volumes of loose, iron-rich soil high into the atmosphere.

Prelims Facts (One Liners):

- The red sky in Western Australia was caused by dust particles rich in iron oxides (Fe_2O_3).
- Mie Scattering describes how larger particles like dust scatter light, filtering shorter wavelengths to leave a red hue.

MCQ Practice: Q. The deep red sky observed during Tropical Cyclone Narelle was primarily due to which atmospheric phenomenon? A) Rayleigh Scattering B) Mie Scattering C) Greenhouse Effect D) Ozone Depletion **Answer: B** (Mie Scattering by large iron-rich dust particles caused the unusual red sky.)

Topic 15: Solid Waste Management (SWM) Rules-2026



Summary: The MoEF&CC has notified the revised Solid Waste Management (SWM) Rules, 2026, which mandate a four-bin system for waste segregation at source. This reform aims to address the inefficiencies of the earlier two-bin system, which led to high contamination of recyclables.

Background: Improper segregation poses health risks for sanitation workers and leads to toxic leachate in landfills. The new rules apply to all households, institutions, and commercial establishments.

Key Points:

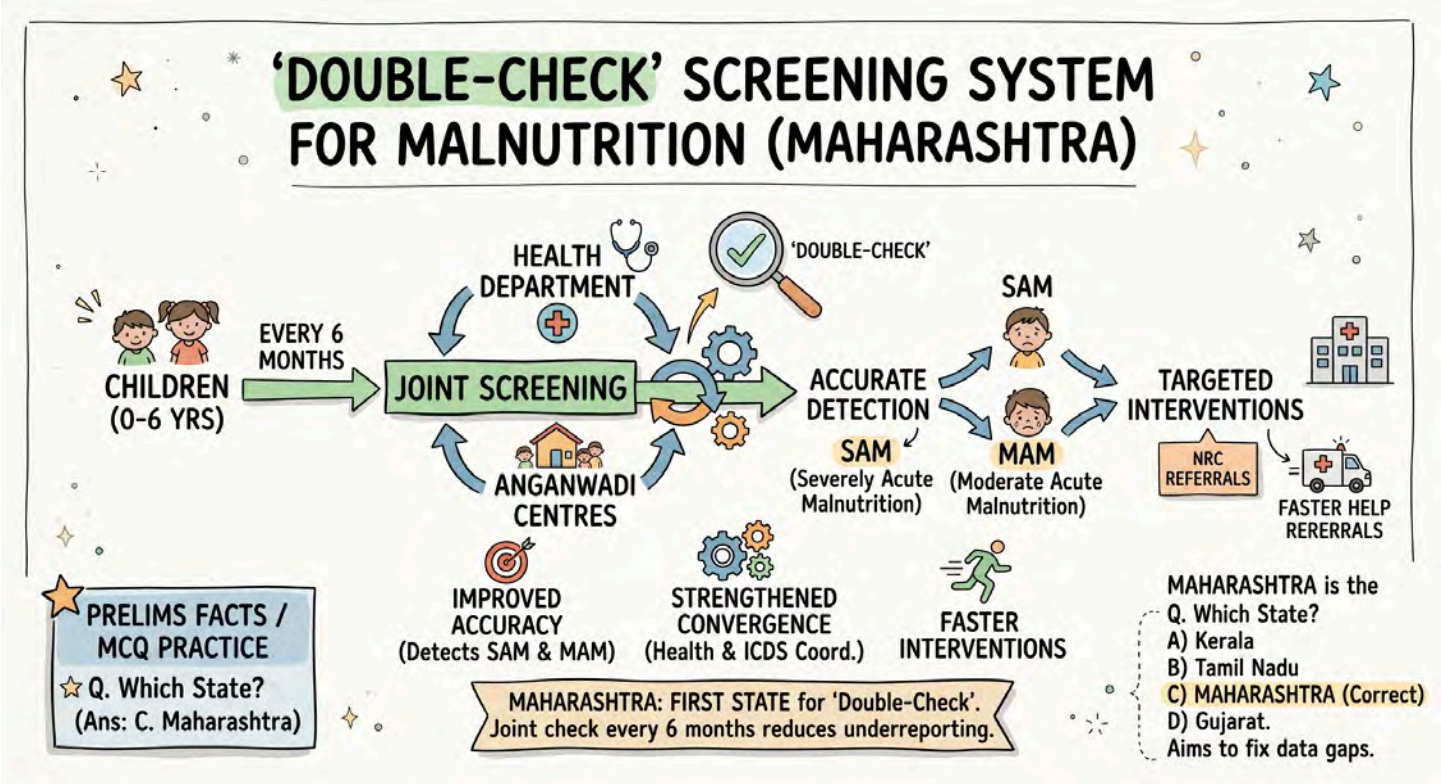
- **New Red Bin:** Specifically designated for sanitary waste like diapers and pads to ensure they are handled separately from general waste.
- **Mandatory Compliance:** Segregation must occur at the point of generation, with non-compliance attracting penalties from Urban Local Bodies (ULBs).
- **Circular Economy:** By preventing the mixing of hazardous and recyclable materials, the rules facilitate more efficient composting and resource recovery.

Prelims Facts (One Liners):

- Under SWM Rules 2026, the Red Bin is reserved for sanitary waste like diapers and sanitary pads.
- The Black Bin is designated for hazardous waste, including chemicals and e-waste.

MCQ Practice: Q. Under the SWM Rules 2026, which bin colour is specifically designated for sanitary waste like diapers and pads? A) Green B) Blue C) Red D) Black **Answer: C** (The new Red Bin ensures sanitary waste is segregated at source for safer handling.)

Topic 16: 'Double-Check' Screening System for Malnutrition



Summary: Maharashtra has introduced a first-of-its-kind 'double-check' screening system to accurately identify child malnutrition. The system mandates joint screening of children aged 0–6 years by health departments and Anganwadi workers every six months to reduce underreporting.

Background: Malnutrition remains a severe challenge in India, with high rates of stunting and wasting. Earlier screenings were often departmental, leading to inconsistent data and missed cases.

Key Points:

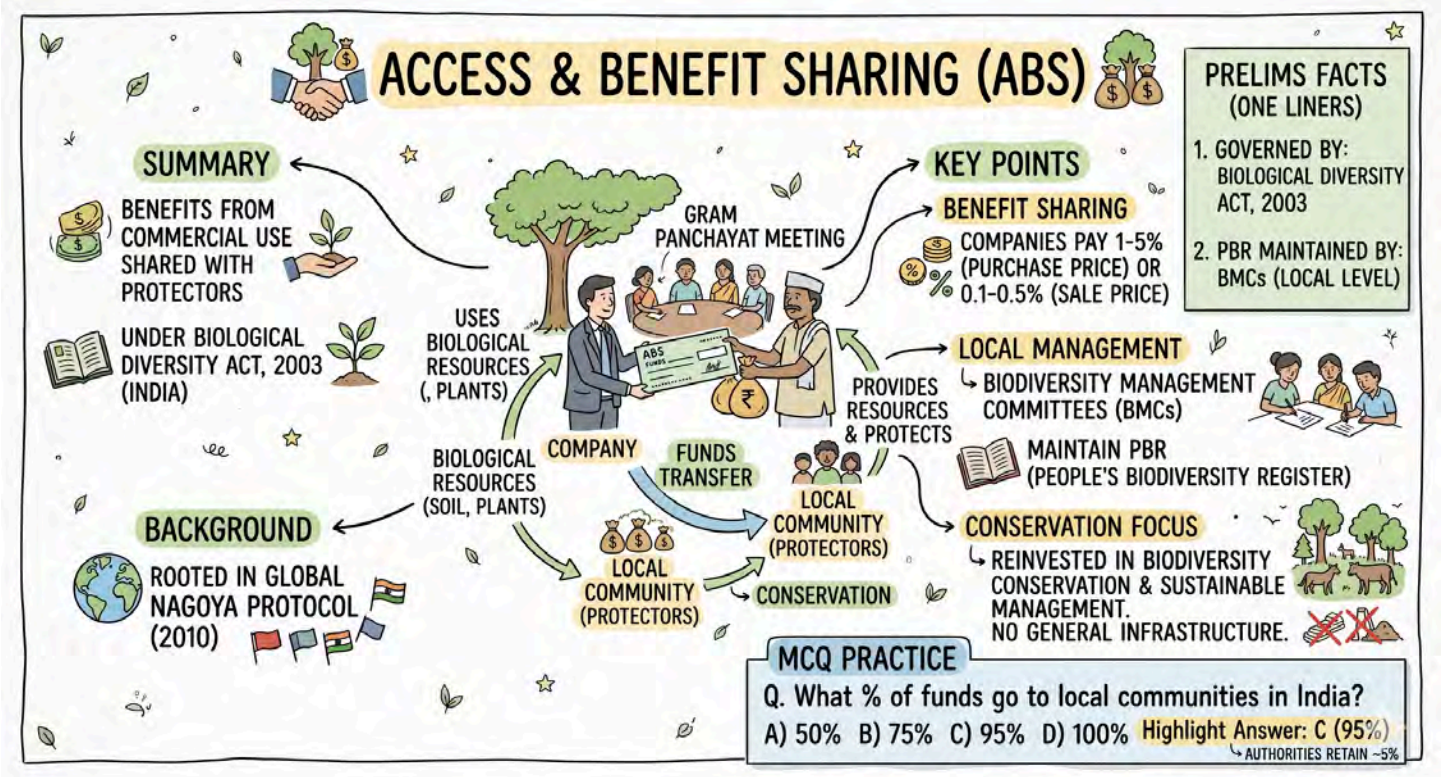
- **Improved Accuracy:** Joint verification cross-checks data to accurately detect Severely Acute Malnutrition (SAM) and Moderate Acute Malnutrition (MAM) cases.
- **Targeted Interventions:** Reliable data allows for faster referrals to Nutrition Rehabilitation Centres (NRCs).
- **Convergence:** The initiative strengthens the coordination between the Health department and the Integrated Child Development Services (ICDS).

Prelims Facts (One Liners):

- Maharashtra is the first Indian state to introduce a 'double-check' screening system for child malnutrition.
- The ICDS (Integrated Child Development Services) programme was originally launched in 1975.

MCQ Practice: Q. Which Indian state recently introduced the 'double-check' screening system to accurately identify SAM and MAM cases in children? A) Kerala B) Tamil Nadu C) Maharashtra D) Gujarat **Answer: C** (Maharashtra's joint screening initiative aims to solve persistent malnutrition data gaps.)

Topic 17: Access and Benefit Sharing (ABS)



Summary: Access and Benefit Sharing (ABS) ensures that financial benefits from the commercial use of biological resources are shared with the local communities that protect them. In India, this mechanism is governed by the Biological Diversity Act, 2003.

Background: Rooted in the global Nagoya Protocol (2010), the mechanism recognizes the rights of indigenous communities over their traditional knowledge and genetic resources.

Key Points:

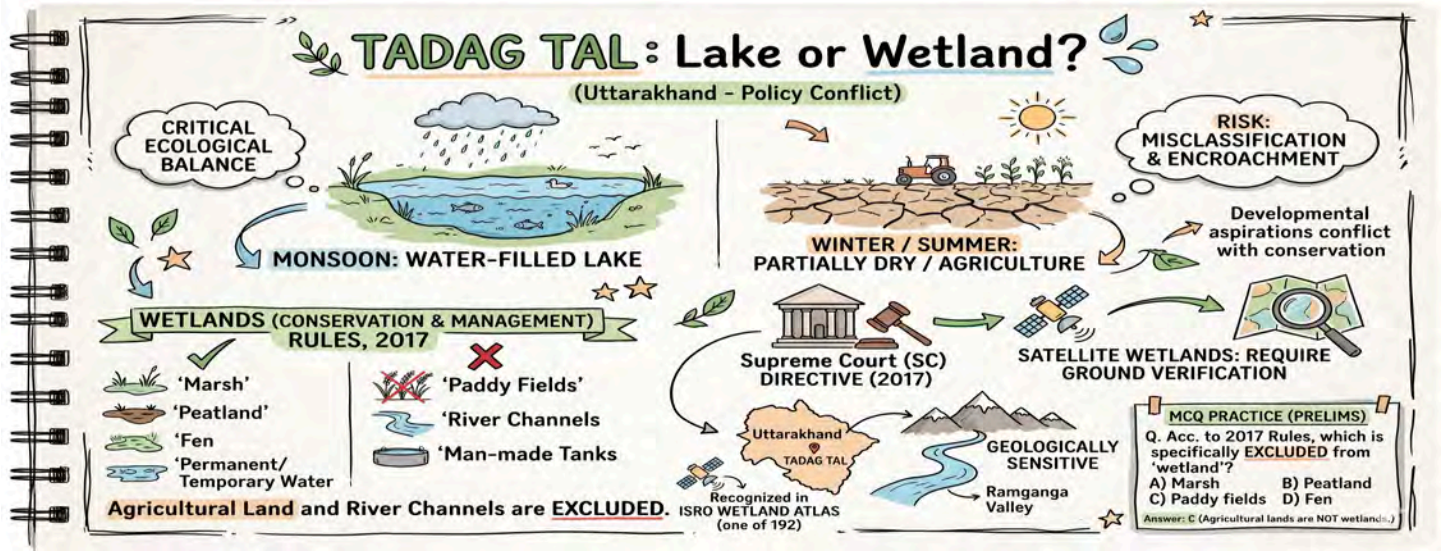
- **Benefit Sharing:** Companies using biological resources must share 1–5% of the purchase price or 0.1–0.5% of the sale price with the community.
- **Local Management:** Biodiversity Management Committees (BMCs) at the Gram Panchayat level maintain the People's Biodiversity Register (PBR) to document local flora and fauna.
- **Conservation Focus:** ABS funds cannot be used for general infrastructure; they must be reinvested into biodiversity conservation and sustainable management.

Prelims Facts (One Liners):

- In India, Access and Benefit Sharing (ABS) is governed by the Biological Diversity Act, 2003.
- The People's Biodiversity Register (PBR) is maintained by Biodiversity Management Committees (BMCs) at the local level.

MCQ Practice: Q. Approximately what percentage of funds collected under the ABS mechanism is transferred directly to local communities in India? A) 50% B) 75% C) 95% D) 100% **Answer: C** (Authorities retain only about 5% for administration, with the rest going to the communities.)

Topic 18: Tadag Tal: Lake or Wetland



Summary: Tadag Tal in Uttarakhand highlights the policy conflict between developmental aspirations and wetland conservation. Due to its seasonal nature—appearing as a lake in monsoon but drying up in winter—it faces risks of misclassification and encroachment.

Background: India has over 231,000 wetlands, but many are under threat from urbanisation. The Wetlands Rules 2017 define wetlands as marsh or peatland but specifically exclude paddy fields and man-made tanks.

Key Points:

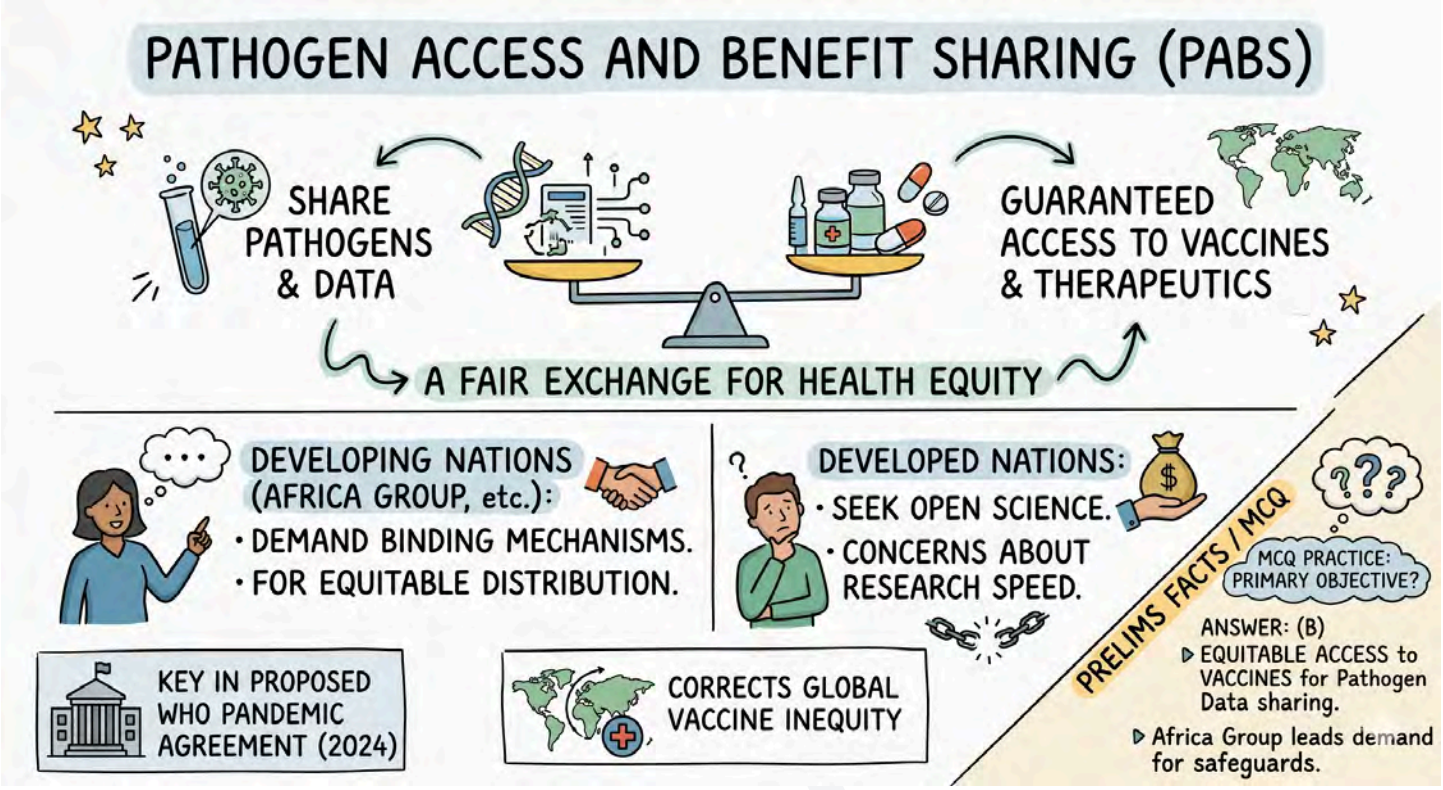
- **Legal Definition:** Wetlands can be temporary or permanent areas of fen or water, but agricultural land and river channels are excluded from this definition.
- **Judicial Oversight:** A Supreme Court directive from 2017 mandates that satellite-identified wetlands must undergo ground verification and demarcation.
- **Fragile Zone:** Tadag Tal is located in the geologically sensitive Ramganga Valley, making its conservation critical for regional ecological balance.

Prelims Facts (One Liners):

- The Wetlands (Conservation and Management) Rules, 2017, specifically exclude paddy fields and river channels from the definition of a wetland.
- Tadag Tal is listed among the 192 recognised wetlands of Uttarakhand in ISRO's Wetland Atlas.

MCQ Practice: Q. According to the Wetlands Rules 2017, which of the following is specifically excluded from the definition of a wetland? A) Marsh B) Peatland C) Paddy fields D) Fen **Answer: C** (Agricultural lands like paddy fields are not legally classified as wetlands.)

Topic 19: Pathogen Access and Benefit Sharing (PABS)



Summary: The Pathogen Access and Benefit Sharing (PABS) system is a core part of the proposed WHO Pandemic Agreement aimed at ensuring health equity. It proposes that the sharing of pathogens and genetic data by countries must be met with guaranteed access to vaccines and therapeutics.

Background: Developing nations, led by the Africa Group, have resisted draft texts that they claim are "imbalanced," placing heavy obligations on pathogen sharing but offering vague provisions on benefit sharing.

Key Points:

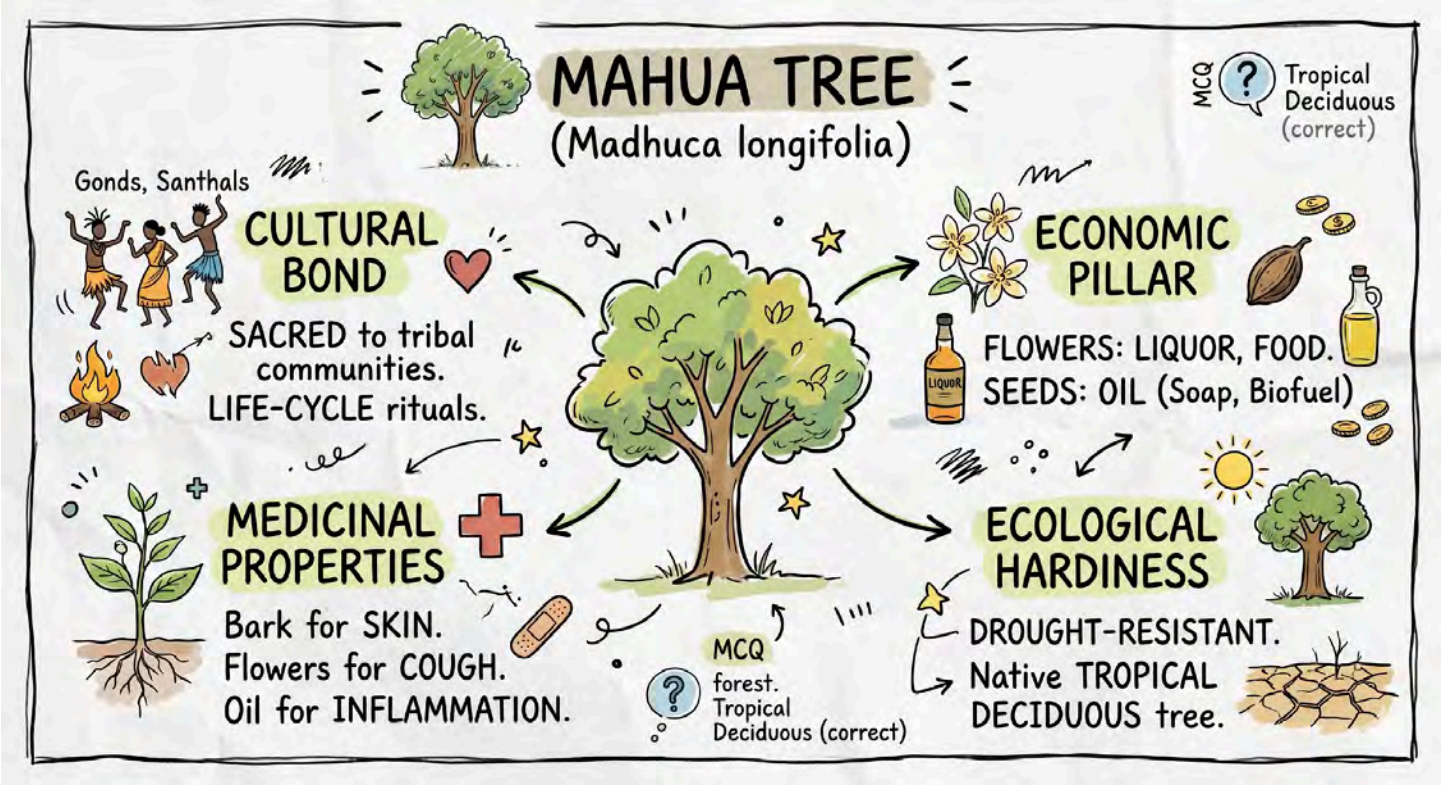
- **Equity Stand:** Developing countries demand legally binding mechanisms that guarantee fair distribution of global public health goods.
- **Developed Nation Stance:** Some developed countries oppose strict benefit-sharing regulations, arguing they could hinder "open science" and research speed.
- **Sovereignty:** The PABS negotiations are closely linked to international norms established under the Nagoya Protocol on genetic resources.

Prelims Facts (One Liners):

- PABS (Pathogen Access and Benefit Sharing) is a key component of the proposed WHO Pandemic Agreement of 2024.
- The Africa Group and the Group for Equity are leading the demand for enforceable equity safeguards in pathogen sharing.

MCQ Practice: Q. What is the primary objective of the Pathogen Access and Benefit Sharing (PABS) system proposed by the WHO? A) To ban all viruses B) To ensure equitable access to vaccines in exchange for pathogen data sharing C) To stop global travel during pandemics D) To privatise medical research **Answer: B** (PABS seeks to correct the global inequities seen during the COVID-19 vaccine rollout.)

Topic 20: Mahua Tree (*Madhuca longifolia*)



Summary: The Mahua tree is a tropical deciduous species that holds a profound cultural and emotional bond with tribal communities across central and eastern India. It serves as a vital

economic buffer during agricultural lean periods, providing flowers and seeds used in food, medicine, and industry.

Background: Anthropologist Verrier Elwin documented Mahua as being sacred to tribes like the Gonds, Baigas, and Santhals, who associate the tree with life-cycle rituals such as marriage and death.

Key Points:

- **Economic Pillar:** Mahua flowers are used for food and liquor, while the seeds yield high-quality oil for soap, cosmetics, and even biofuel production.
- **Medicinal Properties:** Different parts of the tree are used traditionally to treat skin diseases (bark), coughs and colds (flowers), and inflammation (oil).
- **Ecological Significance:** The tree is highly drought-resistant and hardy, making it a keystone species in dry deciduous forests.

Prelims Facts (One Liners):

- Mahua (*Madhuca longifolia*) is a tropical deciduous tree native to India and sacred to many tribal communities.
- Mahua flowers are a major Non-Timber Forest Produce (NTFP) providing seasonal income for millions of households.

MCQ Practice: Q. The Mahua tree (*Madhuca longifolia*) belongs to which of the following forest categories? A) Tropical Evergreen B) Tropical Deciduous C) Alpine Forest D) Mangrove **Answer: B** (It is a hardy, deciduous species widely distributed across central and northern India.)