



**TARGET: PRELIMS 2026**

# **AUGUST '2025**

## **Short Notes**



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# ENVIRONMENT

## Protected Areas in News

Protected Area	Location	Key Details (from news)	Famous For
Kaziranga National Park	Assam	Eviction drive against encroachments; Gauhati HC intervened (July 30, 2025).	UNESCO site; one-horned rhinoceros, wild water buffalo, swamp deer.
Bandipur National Park	Karnataka	Highlighted for Lantana camara invasion – flammable invasive species threatening ecosystem (26th Aug 2025).	Project Tiger reserve; Asian elephants, tigers, rich dry deciduous forests.
Keoladeo National Park (Bharatpur)	Rajasthan	Fishing cat rediscovered here after being thought extinct in Rajasthan (11th Aug 2025).	UNESCO World Heritage Site; large migratory bird population, Siberian cranes (historic).
Coringa Wildlife Sanctuary	Andhra Pradesh	Wildlife Institute of India fitted GPS collars on fishing cats to study habitat use (11th Aug 2025).	Known for mangrove forests; fishing cats; estuarine biodiversity.
Los Glaciares National Park	Argentina (Patagonia)	Mentioned in context of Perito Moreno Glacier thinning due to climate change.	UNESCO site; glaciers, Andean condors, guanacos.





## Animal/Plant Species in News

Name	Why in News?	Important Information / IUCN Status
<b>Fishing Cat</b> ( <i>Prionailurus viverrinus</i> )	Rediscovered in Keoladeo NP (Rajasthan) after being thought extinct; GPS collar study in Coringa WLS (AP).	State animal of West Bengal; indicator of healthy wetlands; IUCN: Vulnerable.
<b>Jellyfish</b>	Blooms clogging nuclear plant cooling pipes, causing shutdowns; linked to climate change, overfishing, and pollution.	Marine invertebrates; population surges signal ecosystem imbalance; not assessed globally as a single species.
<b>Arabidopsis thaliana</b> (Thale cress)	IISER Pune study on how cell geometry and stress influence root regeneration.	Model plant in genetics and developmental biology; not threatened.
<b>Potato (<i>Solanum tuberosum</i>) &amp; Wild Tomato ancestor</b>	Study traced potato's origin ~9 million years ago from hybridisation between a wild tomato and a potato-like species.	Staple food crop; wild relatives vital for genetic diversity. IUCN: Not threatened (cultivated crop).
<b>Mangroves</b>	Editorial highlighted their ecological & economic value: storm protection, fisheries support, carbon storage.	"Blue carbon" ecosystems; critical habitats; many mangrove species fall under IUCN: Vulnerable/Endangered (e.g., Sundari tree <i>Heritiera fomes</i> ).
<b>Asgard Archaea</b> ( <i>Odinarchaeota</i> )	IISc study on unique proteins giving clues to evolution of complex life.	Microbes, not under IUCN; closest known relatives of eukaryotes.
<b>Vasuki indicus</b> (prehistoric snake fossil)	Mentioned in debate on fossil protection; ~47 million-year-old fossil from India.	One of the largest snakes ever discovered; fossil heritage under threat. Not under IUCN (extinct).

## Environmental Laws



| Clear your doubts now.



Law / Rule	Why in News?	Main Objective	Key Points
<b>Forest Conservation Act (FCA), 1980 &amp; Amendment 2023</b>	Haryana govt. narrowed definition of "forest" (2–5 ha, ≥40% canopy) excluding scrublands; criticised as against SC's <i>Godavarman</i> (1996) judgment.	To regulate diversion of forest land for non-forest purposes and maintain ecological balance.	2023 Amendment restricts scope to notified/government-recorded forests; could open ecologically fragile areas like Aravallis to mining/real estate.
<b>Battery Waste Management Rules, 2022</b>	Discussed in EV context; flaws in EPR pricing make safe recycling uneconomical.	To ensure environmentally sound management, recycling, and reuse of waste batteries through Extended Producer Responsibility (EPR).	Low EPR floor price, dominance of informal recyclers, risks of pollution and loss of rare materials like lithium, cobalt, nickel.
<b>Environment Protection (Management of Contaminated Sites) Rules, 2025</b>	Newly notified; India's first legal framework to clean up chemically contaminated sites (100+ identified, only 7 cleaned so far).	To identify, assess, and remediate contaminated sites, ensuring safe environment and applying polluter-pays principle.	District officials to report sites every 6 months; state boards confirm; cleanup funded by polluters or govt; no fixed deadlines for restoration; exemptions for radioactive, mining, oil spill waste.
<b>Animal Birth Control (ABC) Rules, 2001 &amp; 2023 + Prevention of Cruelty to Animals Act, 1960</b>	SC ordered stray dogs in Delhi-NCR to be sent to shelters after rabies death; conflicts with ABC policy of sterilisation & release.	ABC Rules: To control stray animal population humanely by sterilisation & vaccination. PCA Act: To prevent cruelty and promote humane treatment of animals.	2023 update expanded to cats, classified strays as "community animals," promoted feeding points. SC directive may shift policy from release to sheltering.
<b>Wildlife Protection Act, 1972</b>	Protocols for tiger carcass investigation highlighted; Balaghat case showed lapses.	To protect wild animals, birds, and plants; ensure ecological and environmental security.	Unnatural tiger deaths treated as poaching; strict protocols include site sealing, forensic autopsy, NTCA oversight, and incineration of carcass.





<b>Forest Rights Act (FRA), 2006</b>	Assam CM assured tribal families with pre-2005 claims under FRA will not be evicted during Kaziranga drives.	To recognise and vest forest rights and occupation in forest land for forest-dwelling Scheduled Tribes and other traditional communities.	FRA protects rights to habitation, cultivation, and forest produce; key safeguard against arbitrary eviction.
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## SCIENCE AND TECHNOLOGY

### SPACE MISSIONS IN NEWS

Mission Name	Space Agency	Year Launched	Objectives	Special Feature
<b>NISAR (NASA-ISRO Synthetic Aperture Radar)</b>	NASA & ISRO (joint)	2025 (launched 30 July)	Track land deformation, glaciers, sea ice, biomass, crops; feed data into climate & disaster models.	First dual-frequency SAR satellite (NASA's L-band + ISRO's S-band).
<b>Gaganyaan (Human Spaceflight Programme)</b>	ISRO	Ongoing (crewed launch planned 2027; uncrewed in 2025)	Send Indian astronauts to Low Earth Orbit; develop crew safety & re-entry systems.	Recent IADT parachute test; sequence includes abort tests + uncrewed flights.
<b>OCO-2 (Orbiting Carbon Observatory-2)</b>	NASA	2014	High-precision measurement of atmospheric CO <sub>2</sub> ; support climate models.	Sun-synchronous orbit; global carbon cycle insights.
<b>OCO-3</b>	NASA	2019	Measure CO <sub>2</sub> , crop growth, drought monitoring.	Mounted on ISS; flexible "pointing mode" for regional studies.





<b>Lunar Fission Reactor (planned)</b>	NASA	Target 2030	Provide 100-kW continuous power on the Moon for habitats & propulsion.	Nuclear power source where solar is unreliable.
<b>Space-Based Solar Power (concept)</b>	ISRO (studied), NASA & others	Not launched (concept only)	Generate solar energy in orbit, beam it to Earth.	Editorial debated feasibility: high costs, safety, transmission losses.
<b>Esrang Space Center (launch site)</b>	Swedish Space Corporation (SSC)	Upgraded 2023–25	Polar orbit launches; Europe's independent access to space.	5,200 sq km landing zone; reduces reliance on French Guiana.

## Diseases in News

Name	Symptom	Causing Organism	Mode of Infection	Areas Spread	Genetic Material	Treatment	Vaccine
Primary Amoebic Meningoencephalitis (PAM)	Early: headache, fever, nausea, vomiting; Later: stiff neck, confusion, seizures, hallucinations, coma; rapidly fatal (death in	<i>Naegleria fowleri</i> (free-living amoeba)	Amoeba enters through nose while swimming; travels to brain; not spread person-to-person,	Kerala (esp. Kozhikode), India; first case 1971; rising due to climate change and warming waters	Eukaryotic protozoan parasite (no DNA/RNA type like virus, but a nucleus-bearing amoeba)	No proven cure; cocktail therapy used (Amphotericin B, Fluconazole, Azithromycin, Rifampin, Miltefosine, Dexamethasone)	No vaccine





	1 – 18 days)		not by drinking water				
Dengue Fever	Fever, severe headache, pain behind eyes, muscle & joint pain, rash; severe forms → hemorrhage, shock	Dengue virus (Flavivirus; 4 serotypes : DENV-1 to DENV-4)	Aedes aegypti mosquito bite	Endemic in India; Asia, Latin America, Africa	RNA virus (positive-sense ssRNA)	Supportive care; fluids, platelet monitoring; no specific antiviral	Dengvaxia (limited use), new vaccine candidates under trial; study highlighted protective “EDE-like antibodies”
Myiasis (New World Screwworm infection)	Non-healing wounds, pain, bleeding, foul odour, visible larvae burrowing into flesh	Cochliomyia hominivorax (blowfly larvae)	Female flies lay eggs in wounds; larvae hatch and eat living tissue	First human case confirmed in US (Aug 2025) after travel from El Salvador; outbreaks in Central America (Panama, Costa	Eukaryotic insect parasite (dipteran fly; not virus/bacteria)	Removal of larvae, wound cleaning, antibiotics to prevent secondary infection	No vaccine; eradication earlier via Sterile Insect Technique







				Rica, Nicaragu a, Honduras )			
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## Vaccines in News

Name	Type of Vaccine	Used in India?	Effective Till
RTS,S (Mosquirix)	Protein-based subunit vaccine targeting <i>Plasmodium falciparum</i> CSP antigen	Not yet part of India's programme; piloted in Africa	~55% efficacy; protection wanes in ~18 months without booster
R21/Matrix-M	Protein-based vaccine with saponin-based Matrix-M adjuvant	Approved by WHO (2023); Serum Institute of India is co-producer → India expected to use	Up to 77% efficacy; longer-lasting than RTS,S (2+ years with boosters)
AdFalcivax	Transmission-blocking + protective malaria vaccine (targets <i>P. falciparum</i> & <i>P. vivax</i> )	Indigenous Indian candidate, under trials	Data pending; expected to provide dual action (human + mosquito cycle)
PfSPZ (Sanaria)	Whole sporozoite vaccine (live, weakened sporozoites)	Not yet in India (under trials abroad)	Early trials: >79% efficacy; duration under evaluation
PfRH5 (Oxford/partners)	Protein-based subunit vaccine (RhopH5 antigen)	Not in use; experimental stage	Promising early trial results; durability untested
Dengue vaccine – Dengvaxia	Live attenuated chimeric virus vaccine	Not approved for public use in India (used in some countries)	Limited: effective only in seropositive individuals; risk in seronegatives
Next-gen Dengue vaccines (EDE-antibody based, under research)	Antibody-eliciting (broad neutralising antibody design)	Still in labs, not yet in India	Expected to provide cross-serotype





			protection; under development
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## Discoveries and Inventions

Name	What It Does	Sector	Applications	Shortcomings
<b>Ancient Proteins in Asgard Archaea (IISc discovery)</b>	Found proteins (OdinFtsZ1, OdinFtsZ2) that hint at how simple cells evolved into complex life.	Biology / Evolution	Helps explain origin of eukaryotes; can advance biotechnology & molecular evolution studies.	Very early-stage; lab-based, not directly applicable to medicine yet.
<b>Plant Root Healing Mechanism (Arabidopsis study, IISER Pune)</b>	Showed that root tip regeneration depends on cell geometry and mechanical stress.	Plant Science	Can improve crop regeneration; insights for agriculture and genetic engineering.	Only model plant tested; needs validation in food crops.
<b>Potato-Tomato Hybrid Origin Discovery</b>	Found potato originated 9 million years ago via hybridisation between wild tomato ancestor and potato-like plant.	Agriculture / Evolution	Explains tuber formation; can improve breeding strategies for food security.	Purely historical discovery; no direct immediate application.
<b>Radioactive Rhino Horns (Rhisothe Project, South Africa + IAEA)</b>	Injects low-dose isotopes into rhino horns to make them detectable at borders & ports.	Conservation / Wildlife Protection	Deters poaching by making horns traceable and "toxic" for trade.	Expensive (\$290k project cost); requires global cooperation; ethical/environmental concerns.
<b>Quantum Blockchain Random Number</b>	Uses entangled photons + blockchain to	Cybersecurity	Stronger encryption; transparent,	Tech-heavy, not scalable yet; high cost of quantum infrastructure.





<b>Generator ("Twine")</b>	generate truly random numbers for encryption.		tamper-proof keys for digital security.	
<b>Rare Quadruple Star System (UPMJ1040-3551 AabBab)</b>	Astronomers discovered a system with two red dwarfs + two brown dwarfs.	Astronomy	Helps study star & planet formation; links to dark matter distribution.	Rare; observation difficult as brown dwarfs emit little visible light.
<b>Microbe Evolution under Nutrient Control (IIT study)</b>	Showed how altering sugar presentation changes evolutionary paths of microbes.	Biotechnology	Tailored microbes for food, pharma, biofuels; possible way to fight antibiotic resistance.	Still experimental; translating to industrial scale will be complex.
<b>Samudrayaan Submersible (India)</b>	Human-rated Matsya-6000 submersible for 6,000m ocean depth by 2027.	Ocean Tech / Blue Economy	Deep-sea exploration, mineral resources, biodiversity studies.	Extremely costly; tech & safety risks; ecological concerns about seabed mining.
<b>INS Udaygiri &amp; INS Himgiri (Project 17A frigates)</b>	Two stealth frigates with BrahMos, Barak-8, sonar, EW suite.	Defence Tech	Enhance India's naval power, Atmanirbhar push, multi-role maritime ops.	Expensive; depends partly on foreign tech; maintenance-intensive.

## Defence tech

Name / Project	Developed by	What It Is	Special Feature or Relevance
INS Udaygiri & INS Himgiri (Project 17A,	Mazagon Dock (Mumbai) & GRSE (Kolkata)	Stealth, multi-role guided missile frigates	75% indigenous, 200+ MSMEs involved; armed with BrahMos, Barak-8, torpedoes, sonar, EW suite; first





Nilgiri-class frigates)			time 2 big ships from 2 shipyards commissioned together.
X-Guard Fibre-Optic Towed Decoys (FOTD)	Rafael (Israel), used by IAF on Rafales	AI-enabled decoys trailing behind jets, mimic radar/electronic signatures	Mislead enemy missiles; played role in Operation Sindoor; India expanding procurement; Army seeking T-90 decoys; comparable to UK's BriteCloud & US ALE-50.
Nulka Naval Active Missile Decoy (global, US-Australia)	US-Australia	Hovering rocket decoy for warships	Protects ships from anti-ship missiles; referenced in context of India studying advanced naval countermeasures.
MiG-21 Retirement & Tejas Mk1A Induction	MiG-21: Soviet Union; Tejas: HAL, India	MiG-21 (India's first supersonic jet) retiring Sept 2025; Tejas Mk1A is indigenous replacement	MiG-21 inducted 1963, saw all major wars; retirement reduces IAF squadrons to 29 vs ideal 42; Tejas Mk1A delayed but key to Atmanirbhar airpower.
Operation Sindoor Decoys	IAF	Use of electronic & fibre-optic decoys in combat	Showcased India's adoption of modern deception tech in actual operations.

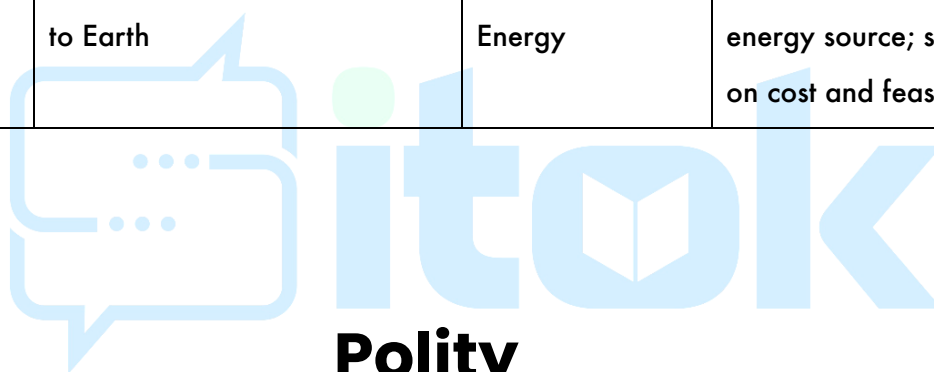
## Green Tech

Name	What It Is	Sector	Purpose / Use
Samudrayaan – Matsya-6000 Submersible	Human-rated submersible for 6,000 m ocean depth, part of Deep Ocean Mission	Ocean Tech / Blue Economy	Exploration of polymetallic nodules, biodiversity, climate studies; supports sustainable ocean resource management.
Mangrove Blue Carbon Valuation	Conceptual framework assigning economic value to mangrove ecosystem services (carbon sequestration, storm protection)	Environment / Climate Finance	Basis for green bonds, carbon credits, and natural capital accounting.





<b>Radioactive Rhino Horns (Rhisothe Project)</b>	Low-dose isotopes injected into rhino horns to deter poaching and enable border detection	Conservation Tech / Wildlife	Protects rhinos, discourages illegal trade; enhances traceability.
<b>Quantum Blockchain RNG ("Twine")</b>	Random number generator using entangled photons + blockchain	Cybersecurity / Digital Sustainability	Provides secure, tamper-proof encryption; supports resilient digital infrastructure.
<b>Battery Waste Management Rules 2022 – Recycling Tech</b>	Extended Producer Responsibility (EPR) framework for recycling EV batteries	Green Energy / E-Waste	Ensures recovery of lithium, cobalt, nickel; reduces pollution from battery waste.
<b>NASA's Lunar Fission Reactor (planned)</b>	100-kW compact nuclear reactor for Moon	Space / Renewable Power	Continuous off-planet clean energy for habitats, reducing reliance on fossil fuels in launches.
<b>Space-Based Solar Power (concept)</b>	Satellites beaming solar power to Earth	Renewable Energy	Theoretical large-scale clean energy source; still debated on cost and feasibility.



## Polity

### Acts and Bills

Act/Bill	Easy Explanation	Relevance/Example
<b>130th Constitutional Amendment Bill, 2025</b>	Says that if a PM, CM, or Minister is arrested and in jail for 30 consecutive days in a case with punishment of 5+ years, they must leave office. Removal for Ministers is by President/Governor on PM/CM's advice; PM/CM must resign on 31st day. Can be reappointed after release.	Aims to curb criminalisation of politics; controversial because arrest ≠ conviction, so it can be misused to remove political opponents.
<b>Jan Vishwas (Amendment of</b>	Extends the 2023 reform. Amends 16 laws across 10 ministries (RBI Act, Drugs & Cosmetics Act,	Reduces over-criminalisation, improves ease of doing business,



| Clear your doubts now.



<b>Provisions) Bill, 2025 (Jan Vishwas 2.0)</b>	Motor Vehicles Act, MSME Act, Electricity Act, etc.). Decriminalises 288 provisions, replacing jail with fines or warnings; introduces “improvement notice” for first-time offenders; fines auto-increase by 10% every 3 years.	reduces court burden (3.6 crore pending cases), encourages entrepreneurship.
<b>National Sports Governance Bill, 2025</b>	Improves governance of sports bodies. Initially proposed all recognised sports organisations under RTI, but final version restricts RTI only to those receiving <b>direct govt funding</b> . BCCI excluded as it doesn't take direct funds, though it gets indirect benefits (tax exemptions, land, monopoly).	Ensures international-standard governance in sports; controversy as BCCI remains outside RTI despite being highly influential.
<b>Online Gaming Act (2025)</b>	Divides online games into <b>E-sports, Social Gaming, and Real Money Games (RMGs)</b> . Aims to regulate classification, taxation, and addiction issues.	Relevant for regulating fast-growing gaming industry; ensures safe gaming environment while curbing gambling-related harms.

## Government Schemes

Scheme/Initiative	Explanation (Simple)
<b>PM Viksit Bharat Rozgar Yojana</b>	New employment-linked support scheme with ₹1 lakh crore outlay. Provides <b>₹15,000/month to newly employed youth</b> and incentives for firms hiring fresh workers. Target: 3.5 crore beneficiaries .
<b>PM JANMAN (2023)</b>	Special mission to support <b>Particularly Vulnerable Tribal Groups (PVTGs)</b> with housing, health, education, and livelihoods. Mentioned in context of Census plans to count PVTGs separately .

## Economy





## Sustainable Economy

Concept	Easy Explanation	Example
<b>Battery Waste Management &amp; Circular Economy</b>	With rising use of EVs and renewable energy, lithium-ion battery waste is growing. India's <b>Battery Waste Management Rules (2022)</b> introduced Extended Producer Responsibility (EPR) to make producers recycle batteries, but weak pricing threatens genuine recycling. Promotes a <b>circular, sustainable economy</b> by reusing rare materials like lithium and cobalt.	Integration of informal recyclers into formal systems, like in the UK where producers pay higher recycling costs.
<b>Mangroves as Economic Infrastructure</b>	Mangroves are not just ecosystems but " <b>blue economy</b> " assets: they protect coasts, support fisheries, store carbon, and reduce disaster risks. Reframing them as economic infrastructure ties environmental health to financial resilience.	Sundarbans' carbon sequestration is valued at ₹462 million/year; Eco-Development Committees in cities like Mumbai involve communities.
<b>Ethanol Blending (E20 Policy)</b>	Biofuel (ethanol) blended with petrol reduces carbon emissions and oil imports. Government targets <b>20% ethanol in petrol by 2025</b> . While it reduces dependence on fossil fuels, it poses challenges for older vehicles.	Brazil's gradual ethanol adoption (now at E27) vs. India's rapid rollout.
<b>Space-Based Solar Power (SBSP)</b>	Concept of putting giant solar panels in orbit to beam energy down to Earth. Provides <b>continuous, zero-carbon power</b> , unaffected by weather or night cycles. Still futuristic but represents a green economic transition idea.	King's College London study: SBSP could meet up to 80% of Europe's renewable energy needs by 2050.
<b>National Green Transition (India)</b>	India announced a <b>50% clean power share by 2025 (five years ahead of target)</b> , boosting green hydrogen, ethanol blending, and biofuels.	Part of Viksit Bharat 2047 vision—linking energy security with climate goals.

## Economic Trends

Concept	Easy Explanation	Relevance
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| Clear your doubts now.



<b>Green Financing</b>	Raising money for eco-friendly projects through bonds, credits, or funds.	Helps India fund renewable energy, EVs, and climate adaptation; UPSC can ask examples like Green Bonds.
<b>Circular Economy (Battery Recycling)</b>	Instead of dumping used products, recycle them back into production cycles.	Battery Waste Management Rules push EV battery recycling → reduces imports of lithium, cobalt, nickel.
<b>Blue Carbon Economy (Mangroves)</b>	Valuing ecosystems like mangroves for carbon storage, disaster protection, fisheries.	Useful for climate finance, green bonds, and coastal resilience.
<b>Ethanol Blending (E20 Policy)</b>	Mixing ethanol with petrol to cut emissions and reduce oil imports.	Target: 20% blending by 2025; helps farmers (sugarcane demand) + reduces crude oil dependence.
<b>Energy Security Transition</b>	India moving from fossil fuels to renewables (solar, wind, hydrogen).	Achieved <b>50% clean power share by 2025</b> , ahead of schedule → boosts sustainable growth.
<b>De-dollarisation</b>	Countries trading in their own currency instead of USD.	India signing rupee trade deals (oil, defence) → reduces forex volatility.
<b>Trade Protectionism</b>	Countries imposing tariffs/duties to protect local industry.	India using anti-dumping duties (like on Chinese steel, electronics).
<b>Blue Economy</b>	Economic activities from oceans done sustainably.	Fishing, shipping, seabed minerals, offshore wind → linked to Samudrayaan mission.

## Economic Developments

Concept	Explanation (Simple Language)	Example
<b>Battery Waste Management Rules (2022) – EPR Pricing Issue</b>	Rules make producers responsible for recycling used EV/renewable batteries. Editorials noted the <b>floor price for EPR certificates is too low</b> , making proper recycling unviable.	Informal recyclers may dominate; risk of losing lithium, cobalt, nickel to unsafe practices.
<b>Ethanol Blending (E20 Policy)</b>	India aims for <b>20% ethanol in petrol by 2025</b> . Reduces oil imports and emissions but may harm older vehicles' engines.	Brazil adopted gradual blending (E27 today) vs. India's fast-tracked E20.







<b>National Green Transition Milestone</b>	India announced achieving <b>50% clean power share by 2025</b> – five years ahead of earlier target.	Solar, wind, biofuels, ethanol, and green hydrogen together form half of installed power capacity.
<b>Blue Carbon Economy (Mangroves as Infrastructure)</b>	Mangroves revalued as <b>economic infrastructure</b> : they protect coasts, store carbon, and support fisheries.	Sundarbans' carbon storage valued at ₹462 million annually.

## International Relations

### Bodies in News

Body/Organisation	What It Does	Relevance in News
<b>Financial Action Task Force (FATF)</b>	Global watchdog on money laundering and terror financing; sets standards countries must follow.	Mentioned in context of India's PMLA implementation – need to align with FATF recommendations.
<b>Integrated Food Security Phase Classification (IPC)</b>	Independent global framework (supported by 19 humanitarian orgs, incl. UN agencies) to scientifically assess famine/hunger.	Declared Gaza in famine (Aug 2025), first famine identified outside Africa.
<b>Shanghai Cooperation Organisation (SCO)</b>	Regional grouping (China, Russia, India, Central Asian states, etc.) focusing on security, connectivity, and cooperation.	India's PM spoke at the 25th SCO Summit: focus on counter-terrorism, connectivity (Chabahar, INSTC), cultural ties, and Global South voice.
<b>United Nations, WTO, IMF, World Bank (Pax Americana system)</b>	Post-WWII institutions that underpinned global rules-based order led by the U.S.	Editorials discussed how Trump's policies challenge these institutions and multilateralism.





## Bilateral/Multilateral Agreements concerning India

Body/Forum	India's Involvement
India-Japan Annual Summit (15th, Aug 2025)	PM Modi visited Japan; both upgraded ties from Global → Strategic → Special Strategic Partnership. Defence pacts (2008 Security Cooperation, 2014 MoU, 2015 Info Protection, 2020 Reciprocal Logistics) already exist. Focus on semiconductors, AI, clean energy, critical minerals, and co-development of defence tech like UNICORN naval mast.
India-China Bilateral Talks (Aug 2025)	First high-level visit since Galwan (2020). Both sides agreed on a <b>dual-track approach</b> : (1) Border talks to prevent clashes, (2) Cooperation in flights, visas, border trade, river cooperation. Trust deficit remains due to troop presence, China-Pakistan nexus, and Brahmaputra dam.
India-Maldives Reset (Aug 2025)	PM Modi attended Maldives' 60th Independence Day. India offered <b>economic aid, debt relief, and development support</b> . This marks a reset after Muizzu's "India Out" campaign in 2023. Seen as part of <b>Neighbourhood First</b> policy.
Indus Waters Treaty (IWT) - Sovereignty Talk	In the Red Fort Charter, there was mention of possibly <b>revisiting the Indus Waters Treaty (1960 with Pakistan)</b> as an assertion of sovereignty.

## Conceptual Terms



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## Environment

Keyword	Official Definition	Easy Explanation
<b>Blue carbon</b>	Carbon dioxide captured and stored by coastal and marine ecosystems such as mangroves and seagrasses.	The carbon absorbed by coastal areas and oceans, like mangrove forests.
<b>Mangrove stewardship</b>	The responsible and sustainable management of mangrove ecosystems for their conservation and restoration.	Taking good care of mangrove forests to make sure they survive and thrive.
<b>Sendai Framework</b>	A 15-year global agreement to reduce disaster risk and loss of life, livelihoods, and health.	A global plan for countries to work together to reduce damage from natural disasters.
<b>Flash floods</b>	A sudden and rapid flood in a low-lying area, often caused by heavy rainfall in a short period.	A sudden and dangerous flood that happens very quickly after heavy rain.
<b>Rugged topography</b>	A type of terrain characterized by steep slopes, deep valleys, and rough, uneven features.	A landscape with very uneven ground, like mountains and deep canyons.
<b>Cloudbursts</b>	An extreme amount of rainfall in a short period of time over a small geographical area.	When a huge amount of rain falls in one small place in a very short time.
<b>Hygroscopic</b>	The ability of a substance to attract and hold water molecules from the surrounding environment.	Something that can easily pull water out of the air.
<b>Albedo</b>	The measure of how much solar radiation is reflected from a surface, with higher albedo meaning more reflection.	A measure of how much light a surface reflects; white surfaces have high albedo, while black ones have low albedo.
<b>Biodiversity</b>	The variety of life in the world or in a particular habitat or ecosystem.	The total number of different plants, animals, and other living things in an area.
<b>Invasive species</b>	A non-native species whose introduction causes or is likely to cause economic or environmental harm.	A plant or animal that is not from a certain place and causes problems for the native plants and animals.





<b>Geostationary orbit</b>	A high orbit where a satellite travels at the same speed as the Earth's rotation, remaining over the same spot on the equator.	An orbit that keeps a satellite fixed in one place above Earth.
<b>Evapotranspiration</b>	The process by which water is transferred from the land to the atmosphere by evaporation and transpiration from plants.	The way water gets from the ground and plants into the air.
<b>Net-zero emissions</b>	The balance between the amount of greenhouse gas emitted and the amount removed from the atmosphere.	Emitting a small amount of greenhouse gas and then removing the same amount, so the total is zero.
<b>Carbon footprint</b>	The total amount of greenhouse gases generated by an individual, event, or product.	A measure of how much pollution you create in your daily life.
<b>Sustainable development</b>	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.	Developing a country or economy in a way that doesn't harm the environment for future generations.
<b>Circular economy</b>	An economic system aimed at eliminating waste and the continual use of resources.	An economy where everything is reused or recycled, so nothing is wasted.
<b>Basel Convention</b>	An international treaty designed to reduce the movements of hazardous waste between nations.	An agreement among countries to control the movement of dangerous trash.
<b>Global warming potential (GWP)</b>	A measure of how much energy the emissions of 1 ton of a gas will absorb over a given period, relative to the emissions of 1 ton of carbon dioxide.	How much a gas will heat up the planet compared to carbon dioxide.
<b>Ecological corridors</b>	A stretch of land or water that connects isolated habitats, allowing wildlife to move between them.	A path or bridge that lets animals move safely from one natural area to another.
<b>Conservation reserves</b>	Areas owned by the government that are protected and managed primarily for wildlife conservation.	Government-protected land where wildlife and their habitats are preserved.
<b>Community reserves</b>	Areas of private or community land that are protected with the help of the local community.	Land protected by local people and communities to save their local environment.





<b>Kyoto Protocol</b>	An international treaty that commits state parties to reduce greenhouse gas emissions.	A global agreement that requires developed countries to reduce their pollution.
<b>Montreal Protocol</b>	An international treaty designed to protect the ozone layer by phasing out the production of numerous substances responsible for ozone depletion.	A global agreement to stop using chemicals that harm the Earth's ozone layer.
<b>Polluter Pays Principle</b>	A principle that states that the party responsible for causing pollution should bear the costs of managing it.	A simple rule: the company that pollutes the environment has to pay to clean it up.
<b>Environmental Impact Assessment (EIA)</b>	A process to identify the environmental, social, and economic impacts of a proposed project.	A study done before a big project to see how it will affect the environment and people.
<b>Biofuels</b>	Fuels derived from biomass, such as plant materials, agricultural waste, or animal waste.	Fuel made from natural, living things like plants and garbage.

## Science and Technology

Keyword	Official Definition	Easy Explanation
<b>Gallium arsenide-based thin films</b>	A type of photovoltaic material used in solar cells that offers higher efficiency compared to traditional silicon.	Solar panels made of a special compound that captures sunlight much more efficiently than normal silicon panels.
<b>Artificial photosynthesis (APS)</b>	A chemical process that mimics natural photosynthesis to convert sunlight, water, and carbon dioxide into chemical fuels.	Creating fuel using sunlight, just like a plant makes its own food.
<b>Green hydrogen</b>	Hydrogen fuel produced through the electrolysis of water using renewable energy sources.	Clean fuel made by using renewable electricity to split water.
<b>Electrolysis</b>	A process that uses electric current to drive an otherwise non-spontaneous chemical	Using electricity to split a liquid like water into its basic parts.





	reaction, such as splitting water into hydrogen and oxygen.	
<b>RFNBOs (Renewable Fuels of Non-Biological Origin)</b>	Synthetic fuels produced from renewable energy sources and captured carbon, without using biological matter.	Fuels that are made from sunlight and air, not from plants or organic materials.
<b>Transmission-blocking vaccines (TBVs)</b>	Vaccines designed to prevent the transmission of a pathogen, such as the malaria parasite, from an infected host to a vector.	A type of vaccine that stops a disease from spreading from a person to an insect, like a mosquito.
<b>mRNA platform</b>	A technology that uses messenger RNA to instruct the body's cells to produce specific proteins to trigger an immune response.	A type of vaccine that tells your body's cells exactly what to do to fight a virus.
<b>RIFIN proteins</b>	A family of proteins produced by the malaria parasite that help it evade the human immune system.	Special proteins that a malaria parasite uses to hide from your body's defenses.
<b>Gene drive</b>	A genetic engineering technology that modifies genes and forces them to be inherited by all offspring, potentially changing an entire population.	A powerful tool that can spread a specific genetic change through a whole species over generations.
<b>NISAR (NASA-ISRO Synthetic Aperture Radar)</b>	A joint Earth-observing satellite mission between NASA and ISRO to study Earth's surface and natural processes.	A satellite built by both the US and India to take detailed pictures of Earth's land and ice.
<b>L-band and S-band radar</b>	Specific frequency ranges of radio waves used in radar systems, with L-band penetrating deeper into surfaces and S-band being more sensitive to moisture.	Two different types of radar waves used by a satellite to see through clouds and measure things like soil moisture.
<b>Sun-synchronous orbit</b>	A type of polar orbit where a satellite passes over any given point on Earth's surface at the same local mean solar time.	An orbit that allows a satellite to always fly over an area at the exact same time of day.
<b>Entangled photons</b>	Pairs of light particles whose properties are so linked that measuring one instantly affects the other, regardless of the distance between them.	Two light particles that are magically linked; if you touch one, the other one instantly knows.
<b>Blockchain hashes</b>	A cryptographic function that takes an input and returns a fixed-size string of characters, used for securing a blockchain.	The digital "fingerprint" of a transaction that makes it secure





		and unchangeable on a digital ledger.
<b>Fission reactor</b>	A device that initiates and controls a sustained nuclear chain reaction to produce energy.	A machine that splits atoms to create a huge amount of energy.
<b>Quantum dots</b>	Tiny semiconductor nanocrystals whose electronic properties are determined by their size and shape.	Extremely small crystals that can be used in advanced electronics and to create vivid colors in screens.
<b>Hydrometallurgy</b>	The process of extracting metals from ores using aqueous solutions.	Getting metals out of rocks using a liquid chemical process instead of heat.
<b>Nanoparticles</b>	Particles that are between 1 and 100 nanometers in size and exhibit unique physical and chemical properties.	Tiny particles, a billionth of a meter in size, used in medicine and technology.
<b>Tele-diagnostics</b>	The use of telecommunications technology to provide medical diagnoses from a remote location.	Doctors using technology to diagnose a patient who is in a different location.
<b>CRISPR tools</b>	A collection of powerful molecular tools used to edit genes with high precision.	A set of tools that can precisely cut and change DNA, like a biological editing system.
<b>Satellite internet</b>	Internet connectivity delivered to users via communication satellites in Earth's orbit.	Internet service that comes from a satellite in space instead of cables on the ground.
<b>Geostationary orbit</b>	A high orbit where a satellite travels at the same speed as the Earth's rotation, remaining over the same spot on the equator.	An orbit where a satellite stays fixed in one place above Earth.
<b>Pleiotropic response</b>	The phenomenon where a single gene influences two or more seemingly unrelated traits.	When one single gene affects many different things in an organism, like a ripple effect.
<b>Near-infrared spectroscopy</b>	A spectroscopic method that uses the near-infrared region of the electromagnetic spectrum to analyze a substance.	A way to study a material by shining a specific type of light on it and seeing how it reacts.





<b>Global Positioning System (GPS)</b>	A satellite-based navigation system that provides location and time information anywhere on Earth.	A network of satellites that tells you exactly where you are and what time it is, anywhere in the world.
<b>Synthetic Aperture Radar (SAR)</b>	A form of radar used to create high-resolution images of landscapes and objects.	A type of radar that creates detailed pictures of the ground from far away, even through clouds.
<b>Cryosphere</b>	The portion of the Earth's surface where water is in solid form, including glaciers, ice caps, and permafrost.	All the places on Earth where water is frozen, like glaciers and ice sheets.
<b>Interferometric SAR (InSAR)</b>	A remote sensing technique that uses two or more SAR images to detect small changes in the Earth's surface.	A type of radar that can measure tiny changes in the ground, like a building sinking by a few millimeters.
<b>Laser Interferometer</b>	An instrument that uses the interference of light beams to make precise measurements of distance or displacement.	A tool that uses lasers to measure incredibly small changes in distance.
<b>Quantum computer</b>	A type of computer that uses the principles of quantum mechanics to perform complex calculations far faster than classical computers.	A super-fast computer that uses the weird rules of subatomic particles to solve problems.
<b>Biofortification</b>	The process of increasing the nutritional value of food crops through plant breeding or genetic engineering.	Making crops healthier and more nutritious by improving them through science.



## Economy

Keyword	Official Definition	Easy Explanation
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<b>Sovereign credit rating</b>	An independent assessment of a country's creditworthiness and ability to repay its debt.	A score that tells the world how safe it is to lend money to a country.
<b>S&amp;P Global Ratings</b>	One of the "Big Three" credit rating agencies that provides credit ratings for governments and corporations.	A major company that gives countries and businesses a trustworthiness score for borrowing money.
<b>Fiscal deficit</b>	The difference between a government's total expenditure and its total revenue, indicating the amount the government needs to borrow.	When a government spends more money than it earns.
<b>Debt-to-GDP ratio</b>	The ratio of a country's public debt to its gross domestic product (GDP), indicating its ability to repay its debt.	A number that compares a country's total debt to its total income.
<b>Foreign exchange (forex) reserves</b>	The foreign currencies and other reserve assets held by a country's central bank.	Money that a country's central bank holds in foreign currencies.
<b>Blue carbon</b>	Carbon dioxide captured and stored by coastal and marine ecosystems such as mangroves and seagrasses.	The carbon absorbed by oceans and coastal areas, like mangroves.
<b>Perpetual tolling</b>	The practice of collecting tolls on a road indefinitely, even after the initial construction costs have been recovered.	Charging a toll on a highway forever, even after the road has been fully paid for.
<b>De minimis rule</b>	A U.S. customs rule that allows low-value goods to be imported without paying duties or taxes.	A rule that lets small-value items be shipped into the US without extra taxes.
<b>Demographic dividend</b>	The economic growth potential that results from a shift in a country's age structure, specifically when the share of the working-age population is larger than the non-working-age population.	The economic boost a country gets when it has a large number of young, working people.
<b>Real vs. nominal GDP</b>	Nominal GDP is a country's total economic output unadjusted for inflation, while real GDP is adjusted for inflation.	Nominal GDP is a country's total income in today's prices; real GDP is the income after adjusting for price changes.
<b>Deflator effect</b>	The impact of a general decrease in prices on economic variables, often causing nominal values to fall even if real output remains stable.	The way falling prices can make a country's economic numbers look weaker than they really are.





<b>Global free market</b>	An international economic system in which participants are free from government intervention or restrictions on trade.	A world where countries can trade with each other without taxes or barriers.
<b>Strategic Bitcoin Reserve</b>	A reserve of the cryptocurrency Bitcoin held by a government or central bank for strategic financial or geopolitical purposes.	A government's reserve of the digital currency Bitcoin for important national reasons.
<b>Foreign Direct Investment (FDI)</b>	An investment made by a firm or individual in one country into a business or company in another country.	When a company from one country opens a new factory or business in another country.
<b>Inflation targeting</b>	A monetary policy where a central bank aims to keep the inflation rate within a specified range.	A central bank's plan to keep price rises from going too high or too low.
<b>Monetary policy</b>	The actions undertaken by a central bank, like the RBI, to influence the availability and cost of money and credit to achieve economic goals.	A central bank's use of money supply and interest rates to manage the economy.
<b>Repo rate</b>	The interest rate at which the central bank lends money to commercial banks in the event of any shortfall of funds.	The interest rate at which a country's central bank loans money to other banks.
<b>Reverse repo rate</b>	The interest rate at which the central bank borrows money from commercial banks.	The interest rate at which the central bank takes money from other banks.
<b>Balance of payments</b>	A statement of all transactions made between a country and the rest of the world over a specific period.	A record of all the money flowing in and out of a country.
<b>Current Account Deficit (CAD)</b>	A measurement of a country's trade where the value of the goods and services it imports exceeds the value of the goods and services it exports.	When a country spends more on imports than it earns from exports.
<b>Fiscal policy</b>	The use of government spending and tax policies to influence economic conditions.	How the government uses spending and taxes to control the economy.
<b>Public debt management</b>	The process of managing a government's debt to minimize its cost and risk.	How a government handles its own borrowing to make sure it can repay it easily.





<b>Gross Value Added (GVA)</b>	A measure of the value of goods and services produced in an area, industry, or sector.	The total value of all goods and services produced in an economy.
<b>Purchasing Managers' Index (PMI)</b>	An economic indicator that surveys purchasing managers in a sector to gauge the state of that industry.	A survey that shows how well the manufacturing and service sectors are doing each month.
<b>Corporate bond market</b>	The financial market where companies issue and trade debt securities.	The market where companies borrow money from investors by selling them bonds.
<b>Recapitalization of banks</b>	The process of injecting new capital into a bank to strengthen its financial position.	The government or investors giving more money to a bank so it becomes stronger.
<b>Non-Performing Assets (NPAs)</b>	Loans or advances for which the principal or interest payment remained overdue for a period of 90 days.	Bank loans that are not being paid back.
<b>Privatization</b>	The process of transferring ownership of a public sector entity to the private sector.	When the government sells a state-owned company to a private company.
<b>Strategic Disinvestment</b>	The government's reduction of its shareholding in a public sector undertaking to below 51%, transferring management control.	When the government sells most of its stake in a company and gives up control.
<b>Merchandise trade deficit</b>	An economic measure that occurs when a country's imports of goods exceed its exports of goods.	When a country buys more physical goods from other countries than it sells.
<b>Special Economic Zones (SEZs)</b>	Geographically defined areas within a country that have more liberal economic laws and tax incentives to attract investment.	Specific areas in a country with special rules and tax benefits to attract businesses.



## International Relations

Keyword	Official Definition	Easy Explanation
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| Clear your doubts now.



<b>Free Trade Agreement (FTA)</b>	A pact between two or more countries to reduce trade barriers such as tariffs and quotas.	A deal between countries to trade with each other without extra taxes or rules.
<b>"Neighbourhood First" policy</b>	A core component of India's foreign policy that prioritizes friendly relations with its immediate neighbors.	India's policy of putting its neighboring countries first in its foreign relations.
<b>Strategic Autonomy</b>	The capacity of a state to make its own independent foreign policy decisions without being pressured by other states.	A country's ability to make its own decisions without other powerful countries telling it what to do.
<b>Multipolar engagement</b>	A foreign policy approach that seeks to engage with multiple global powers rather than being aligned with a single bloc.	When a country works with many different powerful countries, not just one side.
<b>Détente</b>	The easing of hostility or strained relations between countries.	A period of reduced tension between two countries that were once enemies.
<b>Techno-capitalism</b>	A form of capitalism in which technological innovation is the primary driver of economic growth.	An economic system where technology companies and innovations are the main sources of wealth and power.
<b>Rules-based international order</b>	A framework of international relations governed by a shared set of rules and norms, rather than by a single country's power.	A world where all countries follow a set of agreed-upon rules, not just the strongest country's commands.
<b>Pax Americana</b>	A historical period of relative peace and stability in the Western world, mainly because of the military and economic dominance of the United States.	A time of peace and stability in the world because the US was the most powerful country.
<b>Flux Americana</b>	A term used to describe a more uncertain and volatile international order due to a perceived decline in U.S. dominance.	A time of global uncertainty and change because the US is no longer the sole superpower.
<b>SCO Summit</b>	A meeting of the heads of state of the Shanghai Cooperation Organisation, a Eurasian political, economic, and security organization.	The annual meeting of leaders from a group of countries in Asia and Europe to discuss politics and security.
<b>"Reverse Kissinger"</b>	A diplomatic strategy that aims to create a strategic wedge between two hostile states, drawing one closer to one's own country.	A foreign policy move that tries to pull one enemy away from another enemy to make it an ally.





<b>Geopolitics</b>	The study of the influence of geography, economics, and demography on a country's foreign policy and international relations.	The way a country's location and resources affect its relations with other countries.
<b>Indo-Pacific</b>	A term used to describe the vast geographical and geopolitical region of the Indian and Pacific Oceans.	A term for the large area that includes both the Indian and Pacific Oceans.
<b>Foreign policy</b>	The strategies and goals that guide a country's interactions with other countries.	A country's plan for how it will act and deal with other countries.
<b>Diplomacy</b>	The practice of conducting negotiations between representatives of states.	The art of talking and negotiating with other countries to solve problems peacefully.
<b>Soft power</b>	The ability to attract and co-opt rather than coerce, using cultural and political influence.	A country's ability to get what it wants using its culture and values, not military force.



## Polity

Keyword	Official Definition	Easy Explanation
<b>Linguistic reorganisation</b>	The process of reorganizing the administrative boundaries of states based on the languages spoken by the people.	Redrawing state borders in India based on the main languages spoken in those areas.
<b>Grandfather clauses</b>	Provisions in a law that exempt some pre-existing conditions or actions from the new regulations.	A rule in a new law that lets older things or people continue as they were before the law changed.
<b>Articles 14 and 21</b>	<b>Article 14:</b> Guarantees equality before the law. <b>Article 21:</b> Guarantees the right to life and personal liberty.	<b>Article 14:</b> Everyone is equal in the eyes of the law. <b>Article 21:</b> You have the right to live with dignity and freedom.





<b>Kudavolai system</b>	An ancient form of voting practiced in Tamil Nadu, where names of candidates were written on palm leaves and drawn from a pot.	An ancient Indian voting method where names were picked out of a pot.
<b>Article 370</b>	A constitutional provision that gave a special autonomous status to the state of Jammu and Kashmir.	A part of the Indian Constitution that gave special status to Jammu and Kashmir.
<b>Unlawful Activities (Prevention) Act (UAPA)</b>	A law that gives the government and law enforcement agencies powers to deal with activities related to terrorism.	A law that allows the government to stop and punish people involved in illegal and terror-related activities.
<b>Constitution (130th Amendment) Bill, 2025</b>	A hypothetical proposed amendment to the Indian Constitution.	A proposed new change to the Indian Constitution.
<b>Enforcement Case Information Report (ECIR)</b>	A document filed by the Enforcement Directorate to start an investigation under the Prevention of Money Laundering Act (PMLA).	The official report filed by the Enforcement Directorate to begin a money laundering investigation.
<b>Special Intensive Revision (SIR)</b>	A specific campaign or process to revise and update electoral rolls.	A special effort to update and correct the lists of eligible voters.
<b>Electors Photo Identity Card (EPIC)</b>	A government-issued photo identity card for Indian citizens who are eligible to vote.	The photo ID card you use for voting in an election.
<b>Model Code of Conduct (MCC)</b>	A set of guidelines issued by the Election Commission of India for the conduct of political parties and candidates during elections.	A list of rules that political parties must follow during an election campaign.
<b>Habeas corpus</b>	A legal writ that protects individuals against unlawful detention by ordering a person's production before a court.	A legal order that says an arrested person must be brought before a judge to see if their detention is legal.
<b>Mandamus</b>	A legal writ issued by a court to compel a public authority to perform an act that it is legally bound to perform.	A legal order from a court that forces a government official to do their job.

