

CURRENT AFFAIRS

WEEKLY



MAINS ARTICLE

GS-II

- ▢ INDIA-MAURITIUS RELATIONS
- ▢ INDIA-FRANCE STRATEGIC PARTNERSHIP
- ▢ INDIA-NEPAL EDUCATIONAL TIES
- ▢ THE BLOCKING OF VIKATAN
- ▢ SC FLAGS LACK OF DISABLED-FRIENDLY PRISONS IN INDIA
- ▢ STRENGTHENING INDIA'S ELECTORAL REFORMS
- ▢ ASHA WORKERS IN INDIA

GS-III

- ▢ REGULATING INDIA'S ONLINE GAMING SECTOR
- ▢ QUICK COMMERCE
- ▢ INDIA'S ENERGY SECTOR TRANSFORMATION
- ▢ MANGROVES CONSERVATION
- ▢ ECOTOURISM IN INDIA
- ▢ INDIA'S CARBON MARKET
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- ▢ Smooth-coated Otters (Lutrogale perspicillata)
- ▢ Mycelium Bricks
- ▢ Tribal Rights vs. Tiger Conservation in Similipal

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The current affairs articles are segregated from prelims and mains perspective, such separation is maintained in terms of structure of articles. Mains articles have more focus on analysis and prelims articles have more focus on facts.

However, this doesn't mean that Mains articles don't cover facts and PT articles can't have analysis. You are suggested to read all of them for all stages of examination.

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SECTION -A

MAINS ISSUES

INDIA-MAURITIUS RELATIONS

Context

India's evolving role in the **Indian Ocean Region (IOR)** has become a key pillar of its foreign policy. Prime Minister **Narendra Modi's visit to Mauritius (March 11-12, 2025)** and the announcement of the **MAHASAGAR doctrine** highlight India's increasing maritime ambitions.

Why Indian Ocean Region (IOR)?

- **IOR is the center of India's maritime vision**, balancing **China's BRI** and expanding influence in the Indo-Pacific.
- **Trade and Energy Security:** Over **80% of global trade** by volume passes through the Indian Ocean.
- **Strategic Competition:** The IOR is witnessing growing rivalry, especially between **India and China**.
- **China's Expansion:** Through its **Belt and Road Initiative (BRI)**, China has built infrastructure across the region, increasing its economic and military influence.
 - **India's Response – "Necklace of Diamonds" Strategy:** India is countering China's influence by:
 - ◆ Strengthening **strategic partnerships** with IOR nations.
 - ◆ Investing in **ports and naval diplomacy** to maintain a strong presence.
 - ◆ Enhancing **defence and economic ties** with key countries like Mauritius, Seychelles, and Maldives.

India's strategic presence in the IOR & Indo-Pacific

- India aligns with **QUAD principles (US, Japan, Australia, India)** to ensure **freedom of navigation and maritime security**.

- Supports **Diego Garcia base** while recognizing Mauritius's sovereignty over the **Chagos Archipelago**.
- Expanding **regional outreach through port infrastructure, naval exercises, and crisis response** (e.g., **Cyclone Chido aid to Mauritius**).

India's Maritime Strategy (MAHASAGAR vs. SAGAR)

Policy	Announced by	Key focus
SAGAR (Security and Growth for All in the Region)	2015 (Modi's visit to Mauritius)	Promoted peace, security, and regional cooperation .
MAHASAGAR (Mutual and Holistic Advancement for Security and Growth Across Regions)	2025 (Modi's visit to Mauritius)	Broader focus, extending India's influence from IOR to Indo-Pacific in alignment with QUAD .

India-Mauritius Relations

- **Strategic Partnership**
 - Mauritius is key to India's maritime security and influence in the **Indian Ocean Region (IOR)**.
 - India has helped develop **Agaléga Island** for maritime surveillance and set up coastal radar stations. It also supports Mauritius's claim over the **Chagos Archipelago**, while ensuring regional security.

- Mauritius is part of the **Information Fusion Centre for the Indian Ocean Region (IFC-IOR)** and the Colombo Security Conclave, further strengthening security ties.
- **India provides coast guard ships, maritime patrol aircraft, and training to Mauritius.**
- **Plans to establish a National Maritime Information Sharing Centre.**

■ Economic Cooperation

- **Bilateral trade grew from USD 206 million (2005-06) to USD 851 million (2023-24).**
- **Mauritius is India's 2nd largest source of FDI (USD 7.97 billion in 2023-24)** thanks in part to the **Double Taxation Avoidance Agreement (DTAA).**
- **Comprehensive Economic Cooperation and Partnership Agreement (CECPA) signed in 2021 – India's first trade deal with an African nation.**

INDIA-FRANCE STRATEGIC PARTNERSHIP

Context

Prime Minister Narendra Modi visited **France from February 10 to 12, 2024**, at the invitation of **French President Emmanuel Macron**. This visit deepened India-France relations in multiple strategic areas, reinforcing their role as long-term partners in defence, technology, trade, and energy.

India-France Strategic Partnership

- **India and France have been strategic partners since 1998** and have collaborated in defence, space, and nuclear energy.
- During PM Modi's recent visit, both nations **reviewed the "Horizon 2047" Roadmap**, which outlines long-term cooperation goals.
- India and France have traditionally supported a **multipolar world order**, meaning they want a **balanced global power structure, not dominated by one country like the USA or China.**
- **Defence Cooperation:**
 - **France has been a key defence supplier to India, especially after the 1998 Pokhran-II nuclear tests** when other Western nations imposed sanctions on India.
 - France is among the **top three arms exporters globally (2019-2023)** and has been crucial for India's defence modernization.
 - **Key defence agreements during the visit:**
 - ◆ **Scorpene Submarine Project** – Ongoing collaboration for submarines to strengthen India's Navy.
 - ◆ **Additional Rafale fighter jets & helicopters** – France is already supplying **36 Rafale jets**, and discussions continue for more.

- ◆ **Defence Industrial Roadmap** – Focus on co-developing military technology in India under 'Make in India'.
- ◆ **Pinaka Multi-Barrel Rocket Launcher** – India offered this indigenous weapon system to France for joint collaboration.

Key-areas of Significance:

- India-Middle East-Europe Economic Corridor (IMEC)
- The **IMEC was first discussed at the G20 Summit (2023) in New Delhi** and aims to create a new trade route connecting **India, the Middle East, and Europe.**
- **France proposed Marseille (a port city) as a key hub** for this corridor.
- The corridor will have:
 - **Eastern section** – Connecting **India to the Gulf region** (UAE, Saudi Arabia).
 - **Northern section** – Connecting the **Gulf region to Europe.**
- IMEC aims to **reduce dependency on existing trade routes** and provide India a **faster, safer alternative to reach European markets.**
- Nuclear Energy Cooperation: Focus on Small Modular Reactors (SMRs)
- **France is a global leader in nuclear energy, generating 70% of its electricity from nuclear power.**
- **India-France collaboration on nuclear power was a key agenda:**
 - **Jaitapur Nuclear Power Plant (Maharashtra)** – A proposed project for French-built nuclear reactors has **faced delays due to high costs and legal issues.**
 - **New focus on Small Modular Reactors (SMRs) & Advanced Modular Reactors (AMRs)** –
 - ◆ These reactors require **less land and lower investment.**
 - ◆ In **Budget 2024, India announced Rs 20,000 crore for SMR research**, making this collaboration more relevant.
 - **India and France signed a Letter of Intent (LoI) to cooperate on SMRs and AMRs**, signaling a shift in nuclear energy policy.

INDIA-NEPAL EDUCATIONAL TIES

Context

A Nepali woman student at KIIT, Bhubaneswar, died by suicide due to alleged harassment, leading to protests by Nepali students who accused the university of ignoring complaints; in response, KIIT ordered all Nepali students to vacate the campus, causing outrage and intervention by the Nepali government, before eventually withdrawing the order and resuming academic activities.

India-Nepal Educational Ties

- **Historical Connection:** Since the **Rana regime**, Nepalese students have studied in **Banaras, Patna, Gorakhpur, Darjeeling, and Dehradun**.
- **Colonial Influence:** Nepal's first college, **Tri-Chandra College (1918)**, was affiliated with **Calcutta and later Patna University**.
- **Higher Education Growth in Nepal:**
 - ▶ **1959:** Tribhuvan University established (Nepal's first university).
 - ▶ **1971:** New Education System Plan (NESP) introduced to "Nepalise" education.
- Despite these developments, **Nepali students continue to prefer Indian institutions** due to quality education and cultural ties.
- **Foreign Students from Nepal in India**
 - ▶ **Nepalese students form the largest group of foreign students in India.**
 - ▶ **28% of all foreign students in India (2021-22) were from Nepal** (highest among 170 countries).
 - ▶ They are enrolled in **180+ universities across India**, with a preference for **engineering and technology courses** in IITs, IISc, and private institutions like KIIT.

Impact on Indo-Nepal Relations

- **Article 6 of the Indo-Nepal Peace Treaty of 1950** guarantees **equal treatment** for nationals of both countries.
- **Article 7** of the Act ensures **free movement, residence, trade, and education** for each other's citizens.
- KIIT's eviction order violated these treaty provisions, leading to diplomatic concerns.

THE BLOCKING OF VIKATAN

Context

Tamil media platform **Ananda Vikatan** discovered that its website was blocked by multiple internet service providers (ISPs). The Government **gave no prior notice or official order** for this action.

Later, the **Ministry of Information & Broadcasting (MIB)** confirmed that the website was blocked under **IT Rules, 2021**, citing a **cartoon** published by Vikatan. The cartoon satirized a deportation controversy involving Indian migrants in the U.S. The Government claimed it **threatened India's sovereignty and friendly relations with foreign nations**.

Fundamental Rights Violated

- **Article 19(1)(a) - Freedom of Speech & Expression:** Unjustified blocking of news media **curtails press freedom**.
- **Article 19(1)(g) - Right to Practice Any Profession:** Blocking an entire website affects the **business and economic rights** of the media organization.

- **Article 14 - Right to Equality:** Selective and arbitrary blocking raises concerns of **discriminatory enforcement**.
- **Article 21 - Right to Life & Personal Liberty:** Includes **right to information**, which is impacted when access to legitimate content is restricted.

Freedom of Speech vs Restrictions

- **Freedom of Speech (Article 19(1)(a))** is not absolute and can be restricted under **Article 19(2)** for:
 - ▶ Sovereignty & integrity of India
 - ▶ Security of the state
 - ▶ Friendly relations with foreign states
 - ▶ Public order, decency, or morality
 - ▶ Contempt of court, defamation, incitement to an offense
- **Issue in this case:** The **Government failed to demonstrate a direct and immediate threat**, and the **blanket website ban** was excessive.

Present Legal Provisions for Website Blocking

- **Section 69A of IT Act, 2000** allows the Government to block content in the interest of sovereignty, security, public order, or foreign relations.
 - ▶ However, the government must **follow due process**, including **prior notice and opportunity to be heard** unless in an emergency.
- **IT (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021** sets up a **three-tier regulation mechanism** for digital content. It empowers the **Inter-Departmental Committee** to recommend content blocking.
- **Shreya Singhal v. Union of India (2015):**
 - ▶ **Supreme Court upheld Section 69A** but stressed **blocking orders must be transparent and justified**.
 - ▶ **Secretive blocking without proper notice violates due process**.

Why Is This Important?

- **Press freedom and digital rights:** The case raises concerns about **government censorship and lack of transparency** in website blocking.
- **Legal precedent:** The ruling strengthens arguments against **overbroad online censorship** and upholds **due process** in content moderation.
- **Ongoing fight for free speech:** Vikatan's case highlights the **growing legal battles against digital censorship in India**.

SC FLAGS LACK OF DISABLED-FRIENDLY PRISONS IN INDIA

Context

The **Supreme Court of India** raised concerns over the **lack of disabled-friendly facilities in Indian prisons**. The issue was highlighted in a petition citing the **inhumane**

treatment of **Professor G.N. Saibaba and Father Stan Swamy**, both of whom suffered from severe disabilities while incarcerated.

Key Concerns Raised

❑ Inhumane Treatment of Disabled Prisoners

- **Professor G.N. Saibaba**, a **wheelchair-bound academic and human rights activist**, suffered **severe health deterioration** in prison due to inadequate facilities and ultimately passed away.
- **Stan Swamy**, a senior activist suffering from **Parkinson's disease**, was **denied medical treatment** and basic assistive support, leading to his **death in custody**.

❑ Violation of Disability Rights

- Disabled prisoners are **doubly punished**—once for their conviction and again for being disabled.
- Indian prisons **lack ramps, accessibility measures, and essential mobility aids**, violating the **Rights of Persons with Disabilities Act, 2016**.
- Prison manuals **do not mandate** specialized facilities for disabled inmates, forcing them to live under the **same conditions as non-disabled prisoners**, ignoring their specific needs.

❑ Fundamental Rights Violated

- **Article 14 (Right to Equality)**: Disabled prisoners face **discriminatory treatment**.
- **Article 21 (Right to Life & Dignity)**: Denying medical care and basic support violates the fundamental right to **live with dignity**.

Required Measures

Ensuring the dignity and rights of disabled prisoners requires urgent action, including:

- Comprehensive data collection on disabled prisoners.
- **Amend prison manuals** to include **mandatory accessibility provisions**, such as **ramps, disabled-friendly cells, and assistive devices**.
- Regular medical assessments and access to assistive devices.
- Sensitization programs for prison staff on handling disabled inmates humanely.
- Independent oversight mechanisms to prevent abuse.



FACT BOX

Legal and Constitutional Aspects

- **'Prisons'** is a **State subject**, State governments bear the explicit responsibility to ensure that the rights of prisoners with disabilities are upheld.

- All prisoners in India are entitled to the rights to equality, freedom, and life with dignity, as enshrined in the Constitution. The Supreme Court, in **Upendra Baxi vs. State of U.P. (1983)**, affirmed that prisoners have the right to humane conditions.
- **India has laws to protect disabled individuals**, but they are ignored in prisons.
- **Persons with Disabilities Act, 2016**: The Act mandates "reasonable accommodation" and equal rights for persons with disabilities, but no specific provisions exist for prisoners.
 - The lack of accessible infrastructure in prisons directly violates the Act's intent.
 - India's legal framework lacks provisions for the welfare of disabled prisoners, even under the Persons with Disabilities Act, 2016.
- The **Model Prison Manual (2016)** issued by the **Ministry of Home Affairs (MHA)** mandates dignified prison conditions.
- For prisoners with disabilities, India has international obligations under the **United Nations Convention on the Rights of Persons with Disabilities (UNCRPD)**, which prohibits torture and inhumane treatment.
 - **Reasonable accommodation**, a key principle of the CRPD, is not applied in Indian prisons.
- The **Nelson Mandela Rules (2015)** mandate reasonable accommodations for disabled prisoners.

Global Standards

- Countries like the U.S. and the U.K. have comprehensive laws ensuring accessible and humane treatment of disabled prisoners.

Prison Statistics India (PSI) 2022

- The **Prison Statistics India (PSI) 2022** report by the **National Crime Records Bureau (NCRB)** highlights India's **prison crisis**, but fails to capture a crucial aspect—**prisoners with disabilities**.
- **Key Findings from PSI 2022**:
 - India's prison population stands at **573,220**.
 - **75% of prisoners are undertrials** (awaiting trial, not convicted).
 - **Over 66%** of prisoners belong to **marginalized caste groups (SC, ST, OBC)**.
 - **No official data** exists on **prisoners with disabilities**.
- The **World Health Organization (WHO)** estimates that **1 in 6 individuals worldwide (16% of the population)** lives with a disability. Despite being the **largest minority group, people with disabilities remain invisible** in criminal justice reforms.

STRENGTHENING INDIA'S ELECTORAL REFORMS

Context

The Election Commission (EC) has invited political parties to discuss electoral reforms following allegations of voter roll manipulation and duplicate **Electoral Photo Identity Card (EPIC)** numbers across States.

Key Issues in the Electoral Process

- **EVM and VVPAT Concerns:** A PIL demanding a **return to paper ballots** and **100% VVPAT verification** was dismissed by the Supreme Court in April 2024. However, the court allowed **5% of EVM memory units to be checked** in case of suspected tampering.
- **Electoral Roll Manipulation:** Allegations arose during the **Maharashtra and Delhi elections** regarding fake voters being added to benefit the ruling party.
- **Duplicate EPIC Numbers:** Identical voter ID numbers have been found in different States (e.g., West Bengal, Gujarat, Haryana, Punjab). The EC attributes this to **past decentralization** before shifting to the **ERONET central database** but assures that voters can only cast their vote at designated polling stations.

Issues in the Election Campaign Process

- **Misuse of Star Campaigners:** Political leaders frequently use **abusive language, communal rhetoric, and unverified allegations**.
- **Election Spending Violations:** Candidates exceed spending limits, while **political parties have no spending cap**. The **2024 Lok Sabha elections saw expenses of nearly Rs 1,00,000 crore**, fueling corruption.
- **Criminalization of Politics: 46% of elected MPs in 2024 (251 out of 543) have criminal cases**, with **170 facing serious charges** like rape, murder, and kidnapping.

Proposed Reforms

- **EVM & VVPAT Verification:** Increase sample size for **VVPAT-EVM matching** based on scientific methods. Even a single mismatch should trigger **full manual counting in that region**. Introduce **'totaliser' machines** to aggregate votes from multiple booths for anonymity.
- **Preventing Fake Voters:** Consider linking **Aadhaar with EPIC** after stakeholder discussions. Remove duplicate EPIC numbers from electoral rolls.
- **Regulating Election Campaigns:**
 - ▶ EC should have the power to **revoke 'Star Campaigner' status** for MCC violations.
 - ▶ Enforce limits on **political party election spending** alongside individual candidate limits.
 - ▶ Strictly implement Supreme Court's directive requiring **criminal antecedents of candidates to be publicized three times** before elections.

Current Legal Framework

- Article 324 of the Constitution grants the **EC authority over elections**, including electoral roll preparation, governed by the **Representation of the People Act, 1950**, and related rules.
- The voting process has evolved significantly, from **ballot boxes in 1952** to **Electronic Voting Machines (EVMs) in 2004**, with **Voter Verifiable Paper Audit Trail (VVPAT) introduced in 2019** for added transparency.

ASHA WORKERS IN INDIA

Context

Despite being the backbone of India's rural healthcare system, **ASHAs (Accredited Social Health Activists)** are **protesting nationwide, demanding fair wages and better working conditions**. The protests highlight long-standing issues in their employment status and compensation structure.

Who are ASHAs?

- Accredited Social Health Activists (ASHAs) were introduced in **2005** under the **National Rural Health Mission (NRHM)** to act as a **bridge between rural communities and the public healthcare system**.
- The name **'ASHA' means 'hope' in Hindi**, symbolizing their role in improving healthcare access.
- Today, India has **over a million ASHAs** working in villages across the country.
- **Key-functions of ASHA Workers:** ASHAs **play a crucial role** in rural healthcare, covering a wide range of responsibilities, including:
 - ▶ Promoting **maternal and child health** (ensuring safe pregnancies, deliveries, and immunization).
 - ▶ Identifying and managing **communicable & non-communicable diseases**.
 - ▶ Monitoring **sanitation and hygiene** in communities.
 - ▶ Implementing **health programs** for neglected diseases.
 - ▶ Collecting **birth and death data**.
 - ▶ Assisting in **COVID-19 response**, including vaccination drives and awareness campaigns.
- ASHAs have **gained international recognition** for their contributions, receiving the **WHO Director-General's Global Health Leaders Award (2022)**. Studies show that **women connected with ASHAs are 1.6 times more likely to have safer, institutional deliveries**.

What is the problem?

- The core problem lies in their designation as **'volunteers'**, which prevents them from receiving the benefits of full-time government employees. As a result:

- ▶ ASHAs are **not recognized as permanent employees**, despite their essential role.
- ▶ Their income is largely **incentive-based**, with no fixed salary.
- ▶ They earn as little as Rs 5,000 – Rs 15,000 per month, far below the scale of their work.
- ▶ While the government introduced a benefit package in 2018 (covering accidents, disability, and death), ASHAs still lack job security, pensions, and regular salaries.
- With growing pressure from ASHAs and labor unions, the demand for better pay, job regularization, and social security benefits has intensified, making this a critical policy issue.

Required Measures

- **Fixed salaries** in line with government health workers.
- **Better working conditions** (reasonable working hours, travel allowances).
- **Access to healthcare** for ASHAs themselves.
- **Pension and other benefits** to ensure financial security.

UPSC PYQ

Q: With reference to National Rural Health Mission, which of the following are the jobs of 'ASHA', a trained community health worker? (2012)

- (1) Accompanying women to the health facility for antenatal care checkup
- (2) Using pregnancy test kits for early detection of pregnancy
- (3) Providing information on nutrition and immunization
- (4) Conducting the delivery of baby

Select the correct answer using the codes given below:

- (a) 1, 2 and 3 only (b) 2 and 4 only
(c) 1 and 3 only (d) 1, 2, 3 and 4

Solution: (a)

REGULATING INDIA'S ONLINE GAMING SECTOR

Context

The **Economic Survey 2024-25** has emphasized the need to **accelerate deregulation** to foster business growth, urging the government to **"get out of the way"** to allow industries to thrive. One sector where deregulation is critical is **online gaming**, which is currently **burdened by high taxes and unclear regulations**.

A **2025 Supreme Court stay order** on the **Rs 1.12 lakh crore retrospective GST demand** on online gaming has renewed discussions on the sector's regulatory challenges.

Current Potential of India's Online Gaming Industry

- India's online gaming industry is a **fast-growing sector**, projected to reach **Rs 66,000 crore by 2028** (PwC report).
- Gaming already contributes **1% of India's total GST collection**. The sector creates **2-3 lakh jobs**, in addition to the existing **2 lakh jobs**.
- India has **650 million smartphone users** and a **young population**, providing a **huge user base**.
- The sector can boost **animation, cybersecurity, data analytics, and VFX industries**.
- **Key-drivers of India's gaming industry**
 - ▶ India's gaming industry is booming, driven by **widespread smartphone adoption, affordable internet, and improved hardware**.
 - ▶ With over **2 million smartphone users** and rising penetration, gaming-friendly devices with better processors and RAM have made gaming more immersive.
 - ▶ The availability of **cheap mobile data** has further fueled online gaming adoption, making India a key player in the global gaming market.

Positives of the sector	Negatives of the sector
<ul style="list-style-type: none"> ◦ High Revenue generation ◦ Boost in start-ups since pandemic ◦ Help people to build a professional career and build skills ◦ Can provide employment ◦ Engage into increasing peer-to-peer bonds 	<ul style="list-style-type: none"> ◦ Societal concerns ◦ 'Internet Gaming Disorder' due to addiction to online gaming. ◦ Tax evasions (most apps operate from outside the country) ◦ Lack of regulations ◦ Absence of framework

Challenges for the Sector

- **Illegal Offshore Gambling Websites:** Many foreign gambling sites target Indian users without paying taxes or following regulations. India loses at least \$3 billion annually in unpaid GST due to these sites. They also increase risks like fraud, money laundering, and addiction.
- **High & Uncertain Taxes:** The recent 400% increase in GST on gaming has hurt the industry. Many startups have shut down, and jobs have been lost. **The government levies 28% GST on online gaming**, equating it with gambling, tobacco, and liquor.
- **No Uniform Regulation:** Every state has different gaming laws—some allow gaming, others ban it. There is confusion between online gaming and gambling, leading to unnecessary legal battles.

What Needs to Be Done?

- **Centralized Regulation:** There is need of a **single national law** (like an Online Gaming Act). This will ensure **clear rules on compliance, taxation, and consumer protection**. It can be part of the **Digital India Bill** for better governance.
- **Blacklist Illegal Gambling, Whitelist Legal Platforms:** The government should **ban offshore gambling sites** and **create a list of legal platforms**.
- **Support Responsible Innovation:** Regulating gaming responsibly will **encourage investment and growth**.
- **Predictable and stable policies:** There is need to implement the **Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021**. A **balanced regulatory framework** can **unleash India's online gaming potential**, helping the country achieve its **USD 1 trillion digital economy goal** by 2025-26.

QUICK COMMERCE

Context

Quick commerce (Q-commerce) is a faster version of e-commerce, delivering products in **10-20 minutes** using **dark stores** (warehouses for online orders) and distribution hubs. Instead of customers visiting a store, these platforms bring essentials straight to their doorstep, especially in urban areas.

Why is Quick Commerce Popular?

- **Speed & Convenience:** It meets urgent needs, like ordering snacks, groceries, or medicines late at night.
- **Smart Inventory:** Platforms use customer data to predict demand and stock the right products at the right time.
- **Brand Benefits:** Fast-moving consumer goods (FMCG) brands see faster sales and better market reach, with Q-commerce now making up **35% of online sales** for large companies.
- **Market Growth & Competition**
 - ▶ The Indian quick commerce industry is valued at **USD 3.34 billion** and is set to reach **USD 9.95 billion by 2029**, growing **76% year-on-year**.
 - ▶ **Major players include:** Blinkit (46%) – Market leader, owned by Zomato; Zepto (29%) – Fast-growing startup; Swiggy Instamart (25%) – Backed by Swiggy

Concerns around Quick Commerce

- **Predatory Pricing:** Platforms sell products below cost to eliminate competition and later increase prices (**price gouging**).
- **Data Privacy Risks:** AI-driven pricing can lead to **differential pricing** based on **location, device type, and shopping history**.
- **Small Retailers at Risk:** Traditional **kirana shops struggle** to compete, leading to job losses and market imbalance.

- **Environmental Impact:** More **plastic waste** and **pollution** from delivery vehicles.
- **Gig Worker Exploitation:** Riders face **low wages, job insecurity, and high-pressure delivery targets**.
- **Limited to Big Cities:** Q-commerce is mainly **urban-centric**, with limited expansion into smaller towns.

Road to a Sustainable Q-Commerce Model (Required Measures)

To ensure fair competition and sustainable growth, **regulatory oversight** is crucial. Key solutions include:

- **Fair Market Practices:** The **Competition Commission of India (CCI)** should regulate pricing and prevent monopolistic practices.
- **Partnerships with Kirana Stores:** Hybrid models like **"kirana-powered dark stores"** can create a win-win scenario for small retailers and Q-commerce platforms.
- **ONDC Integration:** The **Open Network for Digital Commerce (ONDC)** can allow small retailers to join digital platforms and compete fairly.
- **Worker Protection:** Enforce **fair wages, insurance, and safety norms** for gig workers.
- **Eco-Friendly Logistics:** Promote **electric vehicle deliveries** and **biodegradable packaging** under the **FAME Scheme**.
- **Data Privacy Regulation:** The **Digital Personal Data Protection Act, 2023** should prevent consumer data misuse.

INDIA'S ENERGY SECTOR TRANSFORMATION

Context

India's power sector, the **sixth-largest globally**, is undergoing a major transformation as it moves toward sustainability and clean energy. Traditionally reliant on coal, India has shifted its focus in the last two decades to meet rising energy demand while fulfilling its climate commitments. This transition is driven by regulatory reforms, new business models, and global agreements. As India works towards its 2030 goal of **500 GW of non-fossil fuel capacity** and a **net-zero emissions target by 2070**, power sector regulations play a crucial role.

Key Policy Reforms

- **Electricity Act, 2003:** The Act allowed private sector participation, introduced competition, and mandated Renewable Purchase Obligations (RPOs).
- **National Action Plan on Climate Change (NAPCC) & Energy Conservation Amendment Act (2022):** It laid the foundation for a national carbon market.
- **Incentives & Investments:** Programs like **Renewable Energy Certificates (RECs), Viability Gap Funding (VGF), and Production-Linked Incentives (PLIs)** have boosted solar, wind, battery storage, and green hydrogen.

India's Power Sector Overview

- India's power sector is among the largest and most diverse in the world, playing a crucial role in economic development.

India's Power Sources (as of January 31, 2025)		
Power Source	Installed Capacity (GW)	Share (%)
Coal	220.49	47.29
Hydro	46.97	10.07
Nuclear	8.18	1.75
Oil & Gas	25.41	5.45
Small Hydro	5.1	1.09
Solar	100.33	21.52
Wind	48.37	10.37
Bio Power	11.41	2.45
Total	466.26	100

- According to the **U.S. Energy Information Administration (EIA)**, as of 2023, India ranked sixth in total energy production with 126.567 quadrillion British thermal units (BTU).
- Operating under a **mix of central and state government policies and private sector involvement**, the sector continues to evolve rapidly.
- Energy Mix:** India's energy mix is shifting significantly, with an increasing contribution from renewable energy sources. As of January 2025, the total installed power capacity stands at **466.26 GW**, with coal remaining the dominant source. However, renewable energy, particularly solar, has witnessed significant growth.

Power Capacity Expansion Trends

- Coal-based power** continues to be crucial for India's energy security, increasing from **211.86 GW in 2022-23 to 220.49 GW in 2024-25**.
- Renewable energy sources**, especially solar power, have grown from **66.78 GW in 2022-23 to 100.33 GW in 2024-25**. Wind energy has seen moderate growth, contributing **10.37%** to the total capacity.
 - Challenges in Renewable Energy Expansion:
 - Grid integration
 - Storage solutions
 - Financial investments
 - Environmental and project delays in hydropower
- Nuclear Energy in India:** India is focusing on nuclear power as a low-carbon, stable energy source. Policy amendments, including relaxed liability laws, aim to attract private and foreign investments. India plans to expand its nuclear capacity to 100 GW by 2047, with 14.3

GW targeted by 2032 and small modular reactors (SMRs) by 2033.

India's National Electricity Plan (2022-32):

- The National Electricity Plan (NEP) outlines India's power expansion strategy:
 - Peak demand forecast:** 277.2 GW by 2026-27, 366.4 GW by 2031-32
 - Installed capacity target:** 609 GW by 2031-32
 - Renewable energy goal:** 500 GW non-fossil fuel capacity by 2030
 - Investment requirement:** INR 33.6 trillion (US\$384.5 billion)
- Power Transmission and Distribution:** India's power distribution includes central, state, and private entities:
 - Central Entities:** Power Grid Corporation of India (PGCIL), NTPC, NHPC, NPCIL, Damodar Valley Corporation
 - State Electricity Boards (SEBs):** Responsible for regional distribution
 - Private Companies:** Tata Power, Adani Electricity, BSES Rajdhani, and BSES Yamuna

India's Targets

- India aims for **net zero by 2070** with **50% non-fossil electricity by 2030** and ranks **fourth globally** in renewable energy capacity, supported by a 36.5% CAGR in solar over 11 years.
- Additionally, its **2030 Nationally Determined Contributions (NDCs)** under the **UNFCCC** highlight five key objectives:
 - Promoting sustainable lifestyles under the **"LIFE" initiative**, reducing emissions intensity of GDP by 45% from 2005 levels
 - Achieving **50% electric power capacity from non-fossil fuel sources**
 - Creating an additional carbon sink of 2.5 to 3 billion tons of CO₂ equivalent through forest and tree cover
 - Enhancing investments in climate-vulnerable sectors like agriculture, water, and disaster management

Government measures for energy transition

- Conservation Amendment Act 2022** amended the Energy Conservation Act, 2001 and introduction of a carbon credit trading scheme.
- National Green Hydrogen Mission:** India launched its National Green Hydrogen Mission in 2023 to support production, use and exports of green hydrogen and its derivatives.

- **PLI Scheme:** Recently, the government concluded two tranches of allocations under the Production Linked Incentives (PLI) Scheme for high-efficiency solar photovoltaic (PV) modules.
- **Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules 2022:** The rules aim to promote the generation, purchase and consumption of green energy, including from waste-to-energy plants, through improving open access.
- **National Framework for Promoting Energy Storage Systems a Viability Gap Funding (VGF) scheme:** The scheme aims to boost the set-up of battery energy storage system (BESS) projects.
- **FDI:** Foreign investors are allowed to make 100 per cent investments in the renewable energy sector under the automatic route, without requiring prior government approval.
- **Pradhanmantri Suryodaya Yojana** is a central government scheme which aims to provide electricity to low and middle-income individuals through solar rooftop installations, along with offering additional income for surplus electricity generation.
- **Biomass-Based Schemes: GOBARdhan and SATAT**
 - ▶ **GOBARdhan:** Galvanizing Organic Bio-Agro Resources Dhan aims to convert cattle dung and agricultural residues into biogas, compressed biogas (CBG), and bio-compressed natural gas (CNG). It promotes circular economy principles and contributes to India's climate goals.
 - ▶ **SATAT:** The Sustainable Alternative Towards Affordable Transportation scheme focuses on setting up compressed biogas production plants. It enhances energy security, reduces emissions, and benefits both rural communities and women.
- **Other Government Initiatives for Solar Energy**
 - ▶ Solar Park Scheme
 - ▶ Atal JyotiYojana (AJAY)
 - ▶ National Solar Mission
 - ▶ SRISTI Scheme
 - ▶ International Solar Alliance (ISA)

UPSC PYQ

- Q:** The question of India's Energy Security constitutes the most important part of India's economic progress. Analyse India's energy policy cooperation with West Asian countries. (2017)
- Q:** "Access to affordable, reliable, sustainable and modern energy is the sine qua non to achieve Sustainable Development Goals (SDGs)". Comment on the progress made in India in this regard. (2018)

MANGROVES CONSERVATION

Context

Tamil Nadu's mangrove forest cover has nearly doubled in just a few years, growing from 4,500 hectares in 2021 to 9,039 hectares in 2024. This increase is due to both new plantations and conservation efforts aimed at protecting existing mangroves. A recent report by Anna University's Centre for Climate Change and Disaster Management highlights this expansion and its impact on carbon storage, climate resilience, and biodiversity.

What are Mangroves?

- Mangroves are **tropical trees** that thrive in conditions most timber could never tolerate — salty, coastal waters, and the interminable ebb and flow of the tide.
- Mangrove forests only grow at tropical and subtropical latitudes near the equator because they cannot withstand freezing temperatures.
- Over 50% of India's mangrove ecosystems are classified as **vulnerable, endangered, or critically endangered**, with South India's mangroves now labeled "**critically endangered**" by the IUCN
 - ▶ **Major threats** include aquaculture expansion, urbanization, and reduced freshwater flow due to upstream activities like dam construction and water diversion.
- India has lost approximately 7.43 sq km of mangrove cover since 2021, with states like Gujarat and the Andaman & Nicobar Islands experiencing significant declines.

Significance of Mangroves:

- ▶ Mangrove forests stabilize the coastline, reducing erosion from storm surges, currents, waves, and tides.
- ▶ They have the ability to store vast amounts of carbon, thus, they are key weapons in the fight against climate change.
- ▶ The **intricate root system of mangroves** also makes these forests attractive to fish and other organisms seeking food and shelter from predators.

Mangroves in India:

- India's total mangrove cover stands at 4,991.68 km², making up 0.15% of the country's total geographical area as per India State of Forest Report 2023 ((ISFR-2023).
- West Bengal has the highest mangrove coverage, accounting for 42.45%, followed by Gujarat at 23.66% and the Andaman & Nicobar Islands at 12.39%.
- The mangrove cover in Gujarat has increased by 253.06 km² between 2001 and 2023, as per ISFR-2023.
- India has about 3% of the total Mangrove cover in South Asia.

- Major Mangroves forests in India
 - ▶ Sundarbans Mangrove Forest, West Bengal
 - ▶ Bhitarkanika Mangroves, Odisha
 - ▶ Godavari-Krishna Mangroves, Andhra Pradesh
 - ▶ Gulf of Kutch Mangroves, Gujarat
 - ▶ Mangroves of Thane Creek, Maharashtra
 - ▶ Pichavaram Mangroves, Tamil Nadu
 - ▶ Chorao Island Mangroves, Goa
 - ▶ Baratang Island Mangroves, Andaman

Schemes/Initiatives to conserve Mangroves

- **MISHTI Scheme: Union Budget 2023-24** announced 'Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI)' to promote and conserve mangroves as unique, natural eco-system having very high biological productivity and carbon sequestration potential, besides working as a bio shield.
- **International Day for Conservation of Mangrove Ecosystems:** 26 July, is marked as the International Day for Conservation of Mangrove Ecosystems as declared by the **United Nations Educational, Scientific, and Cultural Organization (UNESCO)** in 2015.
- **Regulatory measures**
 - ▶ Coastal Regulation Zone (CRZ) Notification (2019) under the Environment (Protection) Act, 1986
 - ▶ the Wild Life (Protection) Act, 1972
 - ▶ the Indian Forest Act, 1927
 - ▶ the Biological Diversity Act, 2002

ECOTOURISM IN INDIA

Context:

The Jammu & Kashmir (J&K) government has announced a new policy to **develop Bangus Valley** as an **ecotourism destination**. This move aims to prevent **unplanned construction**, which has led to **environmental degradation** in popular tourist locations like **Pahalgam, Gulmarg, and Sonamarg**.

What is Ecotourism?

- Ecotourism is a **sustainable form of tourism** that focuses on **preserving natural ecosystems, promoting conservation, and ensuring minimal environmental impact**.
- It encourages responsible travel to **natural areas**, where tourists engage in activities that support **local communities, wildlife protection, and ecological balance**.

- Key Features of Ecotourism:
 - ▶ Emphasizes **nature-based tourism**.
 - ▶ Supports **environmental conservation efforts**.
 - ▶ Promotes **local community participation and benefits**.
 - ▶ Encourages **educational experiences about biodiversity and sustainability**.
 - ▶ Minimizes negative impacts on the environment and **cultural heritage**.

Need for Ecotourism in India

- **India's Rich Biodiversity:** India is one of the **17 megadiverse countries** in the world. The country is home to **4 biodiversity hotspots**:
 - ▶ The Himalayas
 - ▶ The Western Ghats
 - ▶ The Indo-Burma region
 - ▶ The Sundaland (Nicobar Islands)
- **Increasing Environmental Concerns:** Rapid **urbanization, deforestation, and pollution** are threatening India's ecosystems.
 - ▶ Unregulated mass tourism leads to **waste accumulation, resource depletion, and habitat destruction**.
 - ▶ **Human-wildlife conflicts** are rising. **Climate change** is affecting fragile ecosystems like the **Western Ghats and the Himalayas**.
- **Sustainable Development & Economic Benefits:** Ecotourism promotes **sustainable livelihoods** for **tribal and rural communities**. It helps develop **lesser-known remote regions**, boosting **rural economies**.
- **Promotion of Responsible Tourism:** Educates tourists about **local culture, traditional practices, and biodiversity**.

Global Shift Towards Ecotourism

- ▶ With rising environmental awareness, tourists prefer **eco-friendly travel options**.
- ▶ The **United Nations has declared 2021-2030 as the Decade on Ecosystem Restoration**, encouraging sustainable tourism practices.
- ▶ Successful global models like **Costa Rica's biodiversity conservation-based ecotourism** can be replicated in India.

Successful Ecotourism Models in India

- **Thenmala Ecotourism, Kerala:** India's **first planned ecotourism project**, focusing on **sustainable tourism and conservation**.
- **Periyar Tiger Reserve, Kerala:** Promotes **community participation** through **eco-development committees (EDCs)**.

- **Kabini Resorts, Karnataka:** Joint venture between **Tourism & Forest Departments**; a model for **sustainable wildlife tourism**.
- **Dzüleke Village, Nagaland:** Developed **community-based eco-tourism, banned hunting**, and trained locals as **nature guides**.

About Bangus Valley

- Bangus Valley is in **Kupwara district**, near the **Line of Control (LoC)** in north Kashmir.
- **Geography:** The valley consists of **two bowl-shaped valleys** at an altitude of **10,000 feet** above sea level.
- **Strategic Importance:** Previously, the valley was a **militant infiltration route**, but it is now being developed for tourism, like other border areas such as **Gurez, Machil, and Keran**.
- **Connectivity:** The valley is about **100 km from Srinagar** and has limited accessibility.
- The J&K government has introduced **strict ecotourism rules** to prevent **uncontrolled urbanization**:
 - ▶ All infrastructure projects will require **forest clearance through the Parivesh Portal** (a government platform for environmental approvals).

Current Status of the Tourism Sector in India

- India is ranked **10th globally** in terms of **travel and tourism GDP contribution**.
- **International tourist arrivals (ITAs)** are projected to reach **30.5 million by 2028**, indicating **strong future potential**.
- Economic Contribution of Tourism
 - ▶ In **2022**, the tourism sector contributed **USD 199.6 billion** to India's **GDP**.
 - ▶ By **2028**, this contribution is projected to reach **USD 512 billion**, reflecting an **annual growth rate of 7.1%**.
 - ▶ The sector is a **major employment generator**, expected to create **53 million jobs by 2029**.
- **Foreign Tourist Arrivals (FTAs) – Rapid Growth**
 - ▶ **FTAs in 2023** rose to **9.24 million**, up from **6.43 million in 2022**, showing a strong recovery. **Top three source countries** for foreign tourists:
 - ▶ **Bangladesh – 24.5%**
 - ▶ **USA – 20.4%**
 - ▶ **UK – 6.9%**
- India improved its ranking in the **2024 Travel and Tourism Development Index** (World Economic Forum). It ranked **39th** among **119 countries** (up from **54th in 2021**).

◦ **Government Interventions to Promote Tourism in India**

- ▶ **Swadesh Darshan 2.0** – Develops sustainable and responsible tourism destinations.
- ▶ **PRASHAD Scheme** – Enhances pilgrimage and heritage sites.
- ▶ **Dekho Apna Desh** – Encourages domestic travel.
- ▶ **Niche Tourism Promotion** – Focus on eco, wellness, rural, and culinary tourism.
- ▶ **E-Visa Facility** – Available for 167 countries across 7 categories, with reduced fees.
- ▶ **UDAN Scheme** – 53 tourism air routes to boost connectivity.
- ▶ **NIDHI & NIDHI+** – Digitalization of hospitality & tourism sector for ease of business.

UPSC PYQ

- Q: **How can the mountain ecosystem be restored from the negative impact of development initiatives and tourism? (2019)**
- Q: **The states of Jammu and Kashmir, Himachal Pradesh and Uttarakhand are reaching the limits of their ecological carrying capacity due to tourism. Critically evaluate. (2015)**

INDIA'S CARBON MARKET

Context

India has introduced the **Carbon Credit Trading Scheme (CCTS)** under **the Energy Conservation (Amendment) Act, 2022**, replacing the previous **Perform, Achieve, and Trade (PAT) scheme**. This initiative aligns with India's climate goals under the **Paris Agreement** and aims to establish a structured **Indian Carbon Market (ICM)**.

What is the Carbon Credit Trading Scheme?

- The CCTS is a **market-based mechanism** designed to regulate and trade **carbon credits**.
- It seeks to reduce **greenhouse gas (GHG) emissions** by pricing carbon and facilitating carbon trading.
- Unlike the PAT scheme, which focused on improving energy efficiency, CCTS directly targets emission reduction by monitoring emissions per tonne of GHG equivalent.
- **Working Mechanism:** The scheme operates through two mechanisms:
 - ▶ **Compliance Mechanism:** Industries in sectors such as aluminium, cement, fertilizers, iron & steel, and petroleum refineries must meet sector-specific GHG reduction targets. Those exceeding targets earn Carbon Credit Certificates (CCC), while those failing must purchase credits to compensate.

- ▶ **Offset Mechanism:** Entities outside the compliance framework can voluntarily participate and earn carbon credits by adopting cleaner technologies or reducing emissions.
- Initially, the scheme covers energy-intensive industries, which contribute about 16% of India's total emissions. The power sector, which accounts for 40% of emissions, may be included later.
- **Regulatory Oversight:** The scheme is overseen by key government bodies such as the **Bureau of Energy Efficiency (BEE)** and the **National Steering Committee for Indian Carbon Market (NSCICM)**.
- **Importance of CCTS in India's Climate Goals:** India aims to cut its emission intensity by 45% by 2030. The CCTS will encourage private sector participation in adopting clean technologies, renewable energy, and carbon capture solutions, driving India toward its net-zero emissions target.
- **Transparency Concerns:** A lack of publicly available data on industry emissions and compliance can weaken market trust.

How Can India Strengthen CCTS?

- **Adopt International Best Practices:** India can learn from the European Union's ETS and implement gradual emission caps, ensure price stability, and strengthen compliance.
- **Improve Monitoring and Reporting:** A robust Monitoring, Reporting, and Verification (MRV) system can enhance credibility and prevent double counting of carbon credits.
- **Develop a Strong Trading Platform:** A digital registry for tracking carbon credits can improve transparency and prevent fraud. Aligning the system with global markets will ensure smooth trade and avoid restrictions like the EU's Carbon Border Adjustment Mechanism (CBAM).
- **Encourage Industry Participation:** Incentives such as tax benefits for early adopters and support for investments in green technology will drive industry engagement.

What is Carbon Pricing?

- Carbon pricing is an economic approach that assigns a cost to carbon emissions, ensuring that polluters bear the financial burden of their emissions.
- This strategy incentivizes industries to either reduce emissions, pay for pollution, or invest in cleaner alternatives.
- Globally, carbon pricing covers about 25% of emissions across 89 countries. There are three main approaches:
 - ▶ **Emissions Trading System (ETS):** Allows industries to trade carbon credits. It operates under two models:
 - ◆ **Cap-and-Trade:** A cap is set on emissions, and industries can trade allowances within this limit.
 - ◆ **Baseline-and-Credit:** Industries that cut emissions below a set baseline earn credits, which they can sell to others.
 - ▶ **Carbon Tax:** Instead of setting a cap, a direct tax is imposed on each ton of CO₂ emitted, encouraging industries to reduce emissions voluntarily.
 - ▶ **Crediting Mechanism:** Projects that reduce GHG emissions generate carbon credits, which can be traded domestically or internationally.

Challenges in Implementing CCTS

- **Target Setting and Carbon Pricing:** If reduction targets are too lenient, excess carbon credits will lower prices, reducing their impact. If too strict, compliance costs may rise, affecting industries and inflation.
- **Compliance and Enforcement Issues:** Under the previous PAT scheme, half of the required energy-saving certificates (ESCerts) remained unpurchased due to weak enforcement. CCTS may face similar challenges.
- **Delays in Credit Issuance:** The slow issuance of ESCerts since 2021 undermined market confidence. Similar delays in CCTS could discourage investment.

UPSC PYQ

Q: Consider the following statements (2023)

- (5) Statement—I: Carbon markets are likely to be one of the most widespread tools in the fight against climate change.
- (6) Statement—II: Carbon markets transfer resources from the private sector to the State.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement—I and Statement—II are correct and Statement—II is the correct explanation for Statement—I
- (b) Both Statement—I and Statement—II are correct and Statement—II is not the correct explanation for Statement—I
- (c) Statement—I is correct but Statement—II is incorrect
- (d) Statement—I is incorrect but Statement—II is correct

Solution: (b)

Q: The concept of carbon credit originated from which one of the following? (2009)

- (a) Earth Summit, Rio de Janeiro
- (b) Kyoto Protocol
- (c) Montreal Protocol
- (d) G-8 Summit, Heiligendamm

Solution: (b)

WORLD AIR QUALITY REPORT 2024

Context

A recent report by the **Swiss air quality monitoring company IQAir** has ranked Delhi as the world's most polluted national capital for the sixth consecutive year. The **2024 World Air Quality Report** highlights that 13 of the world's 20 most polluted cities are in India.

India's Air Pollution Crisis

- **Most Polluted City in the World:** Byrnihat, located on the Assam-Meghalaya border, recorded the highest PM2.5 concentration of 128.2 µg/m³.
- **Delhi's Pollution Levels:** The capital recorded an annual PM2.5 average of 91.6 µg/m³, nearly unchanged from 2023 (92.7 µg/m³).
- **India's Rank:** India was the fifth most polluted country in the world, with an average PM2.5 concentration of 50.6 µg/m³.
- **Global Pollution Trends**
 - The world's most polluted countries in 2024 were **Chad, Bangladesh, Pakistan, Congo, and India.**
 - Only **12 countries** met the **World Health Organization (WHO) recommended PM2.5 limit** of 5 µg/m³, most of them in Latin America, the Caribbean, and Oceania.
 - 17% of the **8,954 cities worldwide** reported air quality within safe limits.

What is PM2.5 and Why is it Dangerous?

- PM2.5 (particulate matter smaller than 2.5 microns) is one of the most hazardous air pollutants. It originates from **fossil fuel combustion, vehicular emissions, industrial activities, and crop burning.** These fine particles can:
 - Cause **respiratory diseases**, chronic kidney issues, cancer, stroke, and heart attacks.
 - Penetrate deep into the lungs and bloodstream, causing long-term health damage.

- **Major Pollution Sources in India**
 - **Crop Burning:** Responsible for **60% of pollution during peak seasons** in Delhi and surrounding northern states.
 - **Vehicular Emissions:** A major contributor, especially in metro cities.
 - **Industrial Discharges:** Power plants, factories, and refineries release pollutants into the air.
 - **Construction Dust:** Large-scale urban expansion leads to increased dust pollution.

Seasonal Air Pollution Trends

- **January 2024:** Delhi and Himachal Pradesh witnessed **extremely poor air quality.**
- **November 2024:** Punjab, Chandigarh, Haryana, and Himachal Pradesh experienced extreme pollution levels due to stubble burning.

What Can Be Done?

- **Strengthen Air Quality Policies:** Implement stricter emission norms for industries and vehicles.
- **Promote Clean Energy:** Encourage renewable energy sources like solar and wind power.
- **Public Transport & Green Mobility:** Expand metro networks, improve bus services, and promote electric vehicles.
- **Crop Management Solutions:** Incentivize farmers to adopt alternative methods to crop burning.
- **Public Awareness:** Educate citizens on pollution sources and preventive measures.

UPSC PYQ

- Q:** In the cities of our country, which among the following atmospheric gases are normally considered in calculating the value of the Air Quality Index? (2016)
- (1) Carbon dioxide
 - (2) Carbon monoxide
 - (3) Nitrogen dioxide
 - (4) Sulphur dioxide
 - (5) Methane

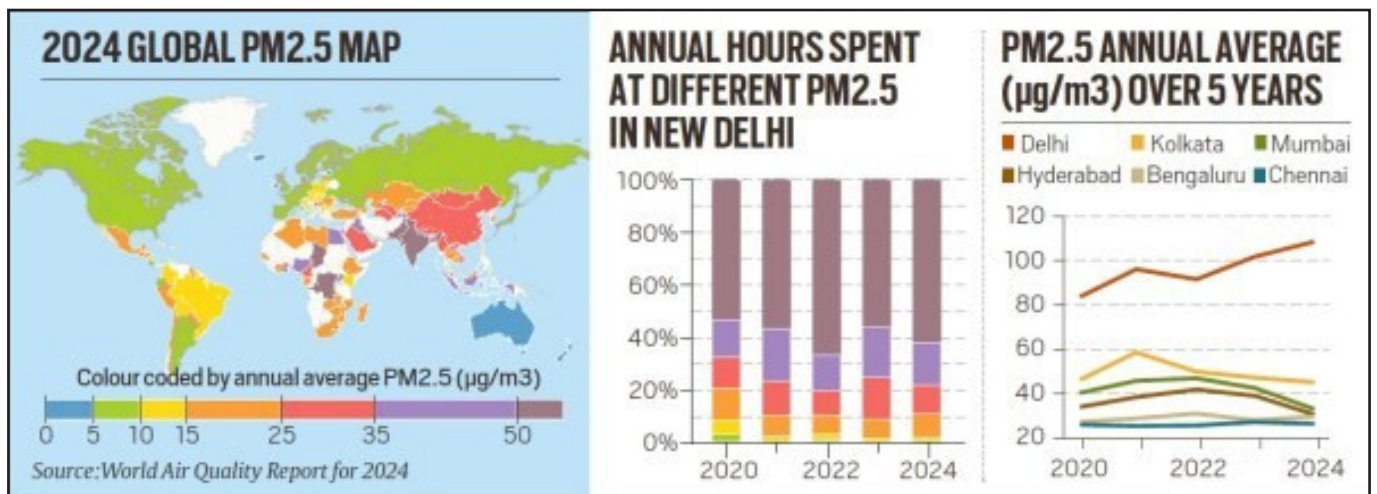


Figure No. 01

Select the correct answer using the code given below:

- (a) 1, 2 and 3 only (b) 2, 3 and 4 only
(c) 1, 4 and 5 only (d) 1, 2, 3, 4 and 5

Solution: (b)

INDIA'S WATER CRISIS AND THE ROLE OF WASTEWATER REUSE

Context

A report titled "*Waste to Worth: Managing India's Urban Water Crisis Through Wastewater Reuse*", published by the Centre for Science and Environment (CSE), highlights the urgent need to **reuse treated wastewater** as a solution to India's increasing water scarcity and environmental pollution.

India's Growing Water Scarcity

- **Water Stress:** India ranks **132nd in global per capita water availability** and is already a **water-stressed nation** (below 1,700 cubic meters per capita per year).
- **Declining Freshwater Resources:** Per capita surface water availability has dropped **73% since 1950** (from 5,200 m³ in 1951 to 1,486 m³ in 2021).
- **Projected Crisis:** If no action is taken, India could soon become "**water scarce**" (below 1,000 m³ per capita).
- **High Demand, Limited Resources:** India has **2% of the Earth's landmass but only 4% of global freshwater resources**, yet it supports **18% of the world's population and 15% of its livestock**.

The Wastewater Crisis in Urban India

- **Sewage Generation:** In 2020-21, urban India generated **72,368 million litres per day (MLD)** of sewage.
- **Insufficient Treatment Capacity:** Only **44% (31,841 MLD)** of sewage had treatment capacity, and only **28% (20,236 MLD)** was actually treated.
- **Future Projections:** Wastewater generation is expected to increase by **75-80% in the next 25 years**, reaching **48 billion cubic meters annually by 2050, 3.5 times the existing treatment capacity**.
- **Environmental Impact:** 72% of sewage **remains untreated**, polluting water bodies and land.

Water Governance and Policy Gaps

- **Urban Dependence on Distant Water Sources:** Cities like **Bengaluru (Cauvery)** and **Hyderabad (Krishna, Godavari)** rely on distant rivers, increasing costs and causing shortages in peripheral areas.
- **Poor Water Management Scores:** The **NITI Aayog Composite Water Management Index** shows that **16 states** score below 50/100, indicating poor performance.
- **Unstructured Wastewater Reuse:** Though wastewater is

informally reused in agriculture and industry, structured policies are lacking.

- **Rural-Urban Water Shift:** Large irrigation projects, such as the **Narmada Project (Gujarat)** and **Bisalpur Project (Rajasthan)**, are being repurposed for urban water supply, reducing water availability for agriculture.
- **Government Targets:** The **Union Ministry of Jal Shakti** mandates cities to **reuse at least 20% of treated wastewater**, but compliance remains low.

What is Water Circularity?

- Water circularity refers to **recycling, reusing, and recovering** water within the treatment cycle to maximize its value while minimizing waste and pollution.

Benefits of Water Circularity in India

- ▶ **Industrial Water Savings:** Using treated wastewater can reduce costs for power plants and data centers, replacing freshwater for cooling.
- ▶ **Irrigation Boost:** India generates **317 km³** of municipal wastewater annually, which could **irrigate 40 million hectares** (10% of all irrigated land).
- ▶ **Economic Benefits:** Recycling wastewater in thermal power plants could save **10 million cubic meters of water annually**, generating **\$300 million per year**.
- ▶ **Nutrient Recovery:** India's **Class I and II cities** generate **2,500 tonnes of nutrients daily** from **6,400 MLD sewage water**, valued at **₹19.5 million**. Recovering nutrients like **nitrogen and phosphorus** can enhance soil health and reduce reliance on synthetic fertilizers.
- ▶ **Artificial Groundwater Recharge:** Treated sewage can **replenish depleted aquifers**, improving long-term water security.
- ▶ **Renewable Energy Generation:** Extracting **biogas from wastewater** can power treatment plants, while **algal biofuel production (3G ethanol)** can support India's climate goals.

UPSC PYQ

Q: Which one of the following ancient towns is well known for its elaborate system of water harvesting and management by building a series of dams and channelizing water into connected reservoirs? (2021)

- (a) Dholavira (b) Kalibangan
(c) Rakhigarhi (d) Roapar

Solution: (a)

Q: With reference to 'Water Credit', consider the following statements: (2021)

- (1) It puts microfinance tools to work in the water and sanitation sector.

- (2) It is a global initiative launched under the aegis of the World Health Organization and the World Bank.
- (3) It aims to enable the poor people to meet their water needs without depending on subsidies.

Which of the statements given above are correct?

- (a) 1 and 2 only (b) 2 and 3 only
- (c) 1 and 3 only (d) 1, 2 and 3

Solution: (c)

SPACEX CREW9 RETURN

Context

NASA astronauts **Sunita Williams and Butch Wilmore** have finally returned to Earth after spending **over nine months** aboard the **International Space Station (ISS)**. Their extended stay was due to **technical failures in Boeing’s Starliner spacecraft**, which was originally supposed to bring them back after just an eight-day mission.

Key-highlights

- Crew-9 was the first crewed test flight of **Boeing’s CST-100 Starliner** under **NASA’s Commercial Crew Program**.
- Starliner faced multiple failures, including **thrustor malfunctions and helium leaks**, making it unsafe for return.
- As a backup, **SpaceX’s Crew Dragon** was sent to retrieve Williams and Wilmore.
- NASA eventually grounded Starliner indefinitely, forcing an unplanned extension of the astronauts’ mission.
- Crew-9 finally returned safely splashing down off the Florida coast.

- ▶ The Crew-9 team included NASA astronauts **Nick Hague, Sunita Williams, Butch Wilmore, and Roscosmos cosmonaut Aleksandr Gorbunov**.
- ▶ The mission lasted **286 days for Williams & Wilmore** and **171 days for Hague & Gorbunov**, during which they traveled millions of miles in orbit.
- ▶ **Method:** The Crew-9 astronauts will return using the splashdown method, a technique where the spacecraft lands in the ocean instead of on solid ground.
 - ◆ A splashdown is a landing method where a spacecraft returns to Earth and lands in water, usually an ocean or sea.

This technique has been used in human spaceflight programs like NASA’s Mercury, Gemini, Apollo missions, and SpaceX Crew Dragon missions.

- The crew carried out **over 150 scientific experiments**, including studies on **plant growth, stem cell research for treating diseases, and microorganism survival in space**.
- The Dragon spacecraft **Freedom**, which transported the crew, has completed its fourth spaceflight and will now undergo inspections for future missions.

Crew-9 Mission

- Crew-9 was part of **NASA’s Commercial Crew Program**, which ensures safe and reliable astronaut transport to and from the ISS.
- The mission contributed to deep-space exploration goals, including **preparations for human missions to the Moon and Mars**.
- The Crew-9 mission was the fourth flight of the Dragon spacecraft named Freedom. It also previously supported NASA’s SpaceX Crew-4, Axiom Mission 2, and Axiom Mission 3.



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SECTION - B

QUICK BYTES

NORTH SEA

Context

A catastrophic collision occurred in the North Sea between the anchored U.S.-flagged oil tanker Stena Immaculate and the Portuguese-flagged container ship Solong.

About North Sea

- The North Sea is a sea of the Atlantic Ocean between **Great Britain, Jutland, Norway, Germany, the Netherlands, Belgium and Hauts-de-France.**



Figure No. 1

- The North Sea is bordered by **the United Kingdom (including Scotland and England), Norway, Denmark, Germany, the Netherlands, Belgium, and France.**

- The Northern Sea Route (NSR) is the **shortest shipping route** for freight transportation between Europe and countries of the Asia-Pacific region.
- It straddles four seas of the Arctic Ocean.
- Running to 5,600 km, the Route begins at the boundary between the **Barents and the Kara seas (Kara Strait)** and ends in the **Bering Strait.**

ACHEULEAN TECHNOLOGY

Context

For the first time, a collection of Acheulean tools—hand axes, thin-edged axes, and large stone knives—has been discovered in China's Central Plains region at the Wenquan Paleolithic site (Ruzhou, Henan Province). This fills a major gap in our understanding of the Paleolithic cultural development in this region.

What is Acheulean Technology?

- Acheulean technology refers to a **stone tool-making tradition** used by early humans between **1.7 million and 150,000 years ago.**
- It marked a major improvement over earlier, simpler tools from the **Oldowan culture.**
- **Acheulean Sites**
 - ▶ **Africa:** Olduvai Gorge (Tanzania), Konso (Ethiopia)
 - ▶ **India:** Didwana (Rajasthan), Bhimbetka (Madhya Pradesh), Hunsgi (Karnataka)
 - ▶ **Europe & Asia:** Boxgrove (UK), Zhoukoudian (China)

Key Features of Acheulean Tools:

- **Handaxes:** Large, almond-shaped, and often pointed tools used for cutting, chopping, and digging.
- **More Advanced Techniques:** Unlike Oldowan tools (which were simple sharp flakes), Acheulean tools required **precise shaping and symmetry**.
- **Used by Homo Erectus & Early Homo Sapiens:** Acheulean tools were made by more advanced human ancestors, showing their improving cognitive skills.

Stone Tools in India's Human History

Period	Tools & Technology	Key Sites
Lower Palaeolithic (600,000 – 150,000 BCE)	Hand axes, cleavers, choppers	Bori (Maharashtra), Son & Sohan valleys (Punjab), Didwana (Rajasthan), Bhimbetka (MP)
Middle Palaeolithic (150,000 – 35,000 BCE)	Flakes, blades, points, scrapers	Narmada valley, Belan valley (UP), Tungabhadra region (South India)
Upper Palaeolithic (35,000 – 10,000 BCE)	Blades, burins, refined tools	Bhimbetka (MP), Karnataka, Maharashtra, Gujarat sand dunes
Mesolithic Age (9000 – 4000 BCE)	Microliths (tiny, composite tools)	Bagor (Rajasthan), Adamgarh (MP), South of Krishna River
Neolithic Age (7000 – 5500 BCE)	Polished stone axes, rectangular axes	Mehrgarh (Balochistan), Burzahom (Kashmir), Gufkral (Kashmir), Senubar (Bihar)

JALANATHESWARAR TEMPLE

Context

The **Jalanatheswarar Temple**, currently in deteriorating state, is not just a place of worship but a **historical archive** that needs urgent conservation to preserve Tamil Nadu's rich heritage.

About the Temple

- The **Jalanatheswarar Temple** is an ancient Shiva temple located in **Thakkolam, Ranipet district, Tamil Nadu**, situated on the **banks of the Kosasthalai River**.
- It is a **historically significant site** with deep connections to the **Pallava and Chola dynasties**.
- **It was built by the Pallavas (6th century CE)**, the temple is one of the oldest in Tamil Nadu.
- Over **51 inscriptions** from the **Pallava, Chola, and Vijayanagara** periods provide crucial information on land grants, donations, and temple activities.
- The **original name of Thakkolam** was **Thiruvural**, as mentioned in hymns by **Saivite minstrels**.
- Under **Chola rule**, the temple became more prominent. **Aditya I, the first great Chola king**, captured Thakkolam from the **Pallavas**, marking the region's shift into the **Chola kingdom**.
- The **Battle of Thakkolam (949 CE)** was a **key event** in Chola history, where **Chola prince Rajaditya was killed** in battle against the **Rashtrakutas**.
- The temple is dedicated to **Lord Shiva**, worshipped as **Jalanatheswarar**. It is mentioned in **Shaivite hymns**, highlighting its religious importance.



Figure No. 02

GLOBAL INTELLIGENCE AND SECURITY CHIEFS CONFERENCE-2025

Context

The **fourth annual conference of global intelligence and security chiefs** was held recently, focusing on key global security challenges and intelligence-sharing mechanisms.

About the Conference

- The conference is India's version of the **Munich Security Conference and Shangri-La Dialogue**.
- It was first held in 2022 and is organized by **India's external intelligence agency, R&AW, and the National Security Council Secretariat (NSCS)**.
- India is leveraging intelligence-sharing to strengthen global alliances, enhance Indo-Pacific security, and counter transnational threats.

NAGORNO-KARABAKH CONFLICT

Context

Armenia and Azerbaijan have finalized a peace agreement, ending nearly four decades of conflict over Nagorno-Karabakh, a disputed region in the South Caucasus.

About the Peace Agreement

- The newly finalized peace agreement aims to:
 - **Officially end hostilities** and establish diplomatic relations.
 - **Confirm Azerbaijan's sovereignty over Nagorno-Karabakh**.
 - **Resolve border disputes** between Armenia and Azerbaijan.
 - **Address demands for territorial access**, such as Azerbaijan's request for a corridor to **Nakhchivan (Azerbaijani enclave)**.

Relevancy for India

- **Strategic trade route:** Armenia and Azerbaijan are part of the **International North-South Transport Corridor (INSTC)**, a key Indian trade route.
- **Diplomatic balance:** India has avoided taking sides but supports a **peaceful resolution** via the OSCE Minsk Group.
- **Geopolitical stability:** A stable South Caucasus benefits global trade and security

What is Nagorno-Karabakh?

It is a **mountainous region** of about **4,400 sq km** (1,700 sq miles).

- Historically, it home to **Christian Armenians and Muslim Azerbaijanis**.

- **Now, it is internationally recognized as part of Azerbaijan**, but previously governed by its Armenian majority.
- **The dispute:** During the Soviet era, Nagorno-Karabakh was an autonomous region within Azerbaijan. But as the USSR collapsed in the late 1980s, its Armenian population wanted to join Armenia, leading to a violent conflict.



Figure No. 03

KYRGYZSTAN AND TAJIKISTAN BORDER DEAL

Context

After 33 years of dispute, Kyrgyzstan and Tajikistan have finally demarcated their entire border, ending one of post-Soviet Eurasia's longest-running conflicts. The historic March 13 agreement resolves violent territorial disputes, reopens trade routes, and establishes water-sharing mechanisms—critical for regional stability.

Why Was the Border Disputed?

Soviet-Era Border Problems

- The **Soviet Union's mapmaking** in Central Asia created artificial borders without considering ethnic, cultural, or water-resource realities.
- Villages were **split between nations, water sources crossed borders**, and **nomadic traditions** were disrupted.
 - ◆ When the **USSR collapsed in 1991**, these **administrative lines became national borders**, leading to disputes.

The Fergana Valley – A Conflict Hotspot

- **Fergana Valley**, shared by **Kyrgyzstan, Tajikistan, and Uzbekistan**, is **densely populated** and has a **history of ethnic and resource tensions**.
- **Over 150 border clashes** occurred in the past decade, mostly over **water access and land disputes**.



Figure No. 04

Key Provisions of the Treaty

- **Finalized Border Demarcation:** The entire 1,006-km (625-mile) border is now officially recognized. 520 km was settled in 2011, and the remaining 486 km were negotiated over the last three years.
- **Reopening Trade & Crossings:** The Kyzyl-Bel and Kairaghach checkpoints, closed since 2021, have reopened. Cross-border trade, which fell from USD 12

million (2023) to USD 1.7 million (2024), is expected to rise to USD 500 million by 2030. New flight routes, like Dushanbe-Tamchi, will boost economic and cultural ties.

- **Water-Sharing Agreement:** A bilateral commission will jointly manage the **Isfara River Basin**, a previous source of conflict.
 - Climate change has shrunk glaciers feeding the **Ak Suu/Isfara River** by 17% since the 1950s, making water management crucial for both nations.

HONORARY ORDER OF FREEDOM OF BARBADOS

Context

India's Prime Minister has been **conferred the 'Honorary Order of Freedom of Barbados'**, the nation's **highest civilian award**, recognizing his **strategic leadership and support during the COVID-19 pandemic**.

About 'Honorary Order of Freedom of Barbados'

- It is **Barbados' highest civilian honor**, awarded for **exceptional service to the country**.
- It recognizes global leaders who **contribute to Barbados' development, democracy, and diplomatic relations**.



Figure No. 05

- **India's PM & International Recognitions:** With this award, India's PM now holds **19 prestigious international honors**, including:
 - RU **Order of St. Andrew the Apostle** (Russia)
 - US **Legion of Merit** (USA)

Barbados:

- **Location:** Caribbean island in the North Atlantic Ocean, northeast of Venezuela.
- **Independence:** 30th November 1966 (from Britain).
- **Republic Status:** In 2021, Barbados removed Queen Elizabeth II as head of state and became a republic.

(See Figure No. 05 at previous page)

BONGOSAGAR 2025 NAVAL EXERCISE

Context

The **India-Bangladesh Naval Exercise Bongosagar 2025**, along with a **Coordinated Patrol (CORPAT)**, was conducted this week in the **Bay of Bengal**. This exercise, a key milestone in **India-Bangladesh defense cooperation**, strengthens maritime security and regional stability under **India's SAGAR (Security and Growth for All in the Region) initiative**.

What is Bongosagar 2025?

- Bongosagar is an annual **bilateral naval exercise** between the **Indian Navy (INS Ranvir)** and the **Bangladesh Navy (BNS Abu Ubaidah)**.
- Objectives of the Exercise
 - **Enhance interoperability** between the two navies.
 - **Strengthen maritime security** cooperation.
 - **Improve coordination** in tactical planning and information sharing.
 - **Boost operational readiness** for responding to security threats at sea.
- It supports India's SAGAR & MAHASAGAR Initiatives
 - **SAGAR (2015)** aims to enhance maritime security, economic cooperation, and regional trust in the Indian Ocean region.
 - **MAHASAGAR (2025)** expands India's maritime engagement to the Global South, boosting security, trade, and development.

INS Ranvir & BNS Abu Ubaidah (The Participants)

- **INS Ranvir** – A **Rajput-class guided missile destroyer**, commissioned in **1986**.
- **BNS Abu Ubaidah** – A modern **Bangladesh Navy warship**, contributing to regional naval defense.

EXERCISE DHARMA GUARDIAN

Context

The 6th edition of India- Japan Joint Military Exercise **DHARMA GUARDIAN** has been conducted in East Fuji Manoeuvre Training area of Japan.

About

- Exercise **DHARMA GUARDIAN** is an **annual event** conducted alternatively in India and Japan.
- Last edition of the same exercise was conducted in Rajasthan in February- March 2024.
- **Aim of the exercise** is to enhance interoperability between the two forces while undertaking joint urban warfare and counter-terrorism operations under UN mandate. The exercise will focus on high degree of physical fitness, joint planning and joint tactical drills.
- **The Indian contingent** comprised 120 personnel, represented mainly by troops from a battalion of the **MADRAS Regiment** along with troops from others arms and services.
- **The Japan Ground Self Defence Force (JGSDF) contingent**, was represented by 34th Infantry Regiment.

Important Bilateral Exercises between India and Japan

- Veer Guardian
- Dharma Guardian
- Maritime Exercises
 - Japan-India Maritime Exercise (JIMEX)
 - Malabar Exercise (India – US-Japan - Australia)
 - Maritime Partnership Exercise (MPX)

EXERCISE KHANJAR-XII

Context

The 12th edition of Exercise Khanjar is currently taking place in Tokmok, Kyrgyzstan, from March 10 to 23. This annual military exercise between India and Kyrgyzstan focuses on counter-terrorism and special operations, enhancing cooperation between the two nations' armed forces.

About Exercise Khanjar

- Exercise Khanjar is a **joint military training initiative** between India's Parachute Regiment (Special Forces) and Kyrgyzstan's Scorpion Brigade.
- It was first conducted in 2011 and has since become a key platform for strengthening defense ties between the two countries.
- The exercise aims to enhance interoperability, tactical coordination, and combat readiness for operations in mountainous and urban environments.

Key Focus Areas of Khanjar-XII (2025)

- Counter-terrorism operations in high-altitude terrain
- Special operations training, including sniping and building intervention
- Mountain warfare techniques
- Urban warfare drills under a United Nations mandate
- Cultural exchanges, including the celebration of Nowruz, to foster deeper military and diplomatic ties

Kyrgyzstan

- Kyrgyzstan, officially known as the Kyrgyz Republic, and also known as Kirghizia, is a country in Central Asia and previously part of the Soviet Union.
- The country is a landlocked country with mountainous terrain.
- Kyrgyzstan is a crucial partner for India in Central Asia, particularly in defense and security cooperation.
- Both countries face similar security challenges, including terrorism and border management, making military collaboration vital.
- The exercise aligns with India's broader goal of strengthening defense ties with Central Asian nations under the India-Central Asia dialogue framework.

About the Gulf of Oman

- A **western extension of the Arabian Sea**, connecting to the **Strait of Hormuz and the Persian Gulf**.
- Bordering countries:** Iran (north), UAE (west), and Oman (south).
- Key islands:** Sheytan Island, Al Fahal Island, Dimaniyat Islands, Sawadi Islands.
- Importance:** It is Iran's **only maritime access to open seas**, making it crucial for trade and energy exports.



Figure No. 06

MARITIME SECURITY BELT

Context

China, Iran, and Russia recently conducted the Maritime Security Belt 2025 naval exercise in the Gulf of Oman, near the Strait of Hormuz.

About the Maritime Security Belt Exercise

- First conducted in 2018, it has since become an annual naval exercise in the Gulf of Oman.
- The exercise focuses on maritime security operations, counter-piracy, and safeguarding critical sea lanes.

Participants:

- Russia:** Warships Rezky, Hero of the Russian Federation Aldar Tsydenzhapov, and support vessel Pechenga.
 - China:** Destroyer Baotou and supply ship Gaoyou Lake.
 - Iran:** Warships and IRGC naval forces.
- Observers from **Azerbaijan, Iraq, Kazakhstan, Qatar, Oman, UAE, Pakistan, Sri Lanka, and South Africa** attended the exercise, reflecting its growing international scope.

APAAR ID

Context

Activists and parents have raised concerns over the rapid push by schools to generate **APAAR IDs** for students, despite its voluntary nature.

What is the APAAR ID?

- APAAR (Automated Permanent Academic Account Registry)** is a key initiative under the **National Education Policy (NEP) 2020** for maintaining academic records digitally.
- APAAR is part of the **“One Nation, One Student ID”** initiative, designed to **digitally store students’ academic records** for seamless transition between schools and higher education institutions.
- It is linked to **Aadhaar** and stored in **DigiLocker**, making it easier for institutions to **verify academic credentials**.
- The **Education Ministry** has directed **CBSE-affiliated schools** and some **state boards** to achieve **100% enrolment** of students in APAAR.
- Is APAAR Mandatory?** Officially, **APAAR is voluntary**. However, **CBSE circulars and state directives** do not clearly inform parents of this.

PM-YUVA 3.0

Context

The **Ministry of Education (MoE) and National Book Trust (NBT) of India** launched the **third edition of the Prime Minister's Young Authors Mentorship Scheme, YUVA 3.0**. The initiative continues the government's efforts to **nurture young writers**, providing mentorship and exposure to develop their creative writing skills.

About YUVA 3.0

- **Objective:** To mentor young writers under 30 years of age, encouraging them to document India's rich cultural heritage and modern contributions.
- **Themes:**
 - **Contribution of Indian Diaspora in Nation Building**
 - **Indian Knowledge System**
 - **Makers of Modern India (1950-2025)**
- **Mentorship & Benefits:**
 - **Six-month mentorship program** with workshops, expert interactions, and exposure to India's literary ecosystem.
 - **Financial assistance** of ₹50,000 per month for six months.
 - **Publishing support** by NBT in multiple languages.
 - **Participation in literary festivals** and international forums.
 - A **National Camp** for YUVA 3.0 authors will be held at the **New Delhi World Book Fair 2026**.

Background of the YUVA Scheme

- The **National Education Policy (NEP) 2020** emphasizes the need to **empower young minds and promote a reading and writing culture**.
- The YUVA scheme was launched to groom young authors as **ambassadors of Indian literature**, contributing to **nation-building** through their writings.
 - **YUVA 1.0 (2021-2023):** Launched as part of **Azadi Ka Amrit Mahotsav**, focusing on **India's freedom movement**.
 - ◆ **Theme:** National Movement of India (Unsung Heroes, Freedom Struggle, Cultural & Scientific Contributions).
 - ◆ **Selection:** 75 young authors, representing **diverse linguistic backgrounds**.
 - ◆ **Mentorship:** Writing and publishing training with **eminent historians, journalists, and literary figures**.
 - **Impact:**
 - ◆ Books translated into **multiple languages**, reaching a broader audience.
 - ◆ **10% royalty paid to authors** on book sales.

- ◆ Many authors gained recognition, contributing to **mainstream literature and academic research**.
- **YUVA 2.0 (2022-2025):** Focused on **Democracy**, encouraging young writers to explore **India's democratic journey**.
 - ◆ **Theme:** Democracy (Institutions, Events, People, and Constitutional Values).
 - ◆ **Selection:** 75 authors shortlisted, required to submit a **10,000-word proposal**.
 - ◆ **Mentorship:** Training with **constitutional experts, historians, and authors**.
- **Impact:**
 - ◆ **41 books** launched at **New Delhi World Book Fair 2025**.
 - ◆ Works translated into **multiple Indian languages**.
 - ◆ Selected authors participated in **national and international literary forums**.
 - ◆ Books included in **academic and government libraries**.

MISSION AMRIT SAROVAR

Context

The Indian Railways **has been enlisted to contribute to the Union government's Mission Amrit Sarovar, focusing on digging ponds to tackle water scarcity. The initiative aligns with Phase 2 of the mission, which emphasizes community participation (Jan Bhagidaari) and aims to rejuvenate or construct new water bodies near railway sites.**

About Mission Amrit Sarovar

- **Launched in: 2022**
- **The scheme was launched as a part of Azadi Ka Amrit Mahotsav**, with the aim of rejuvenating **75 water bodies per district** across India.
- The mission focuses on **enhancing surface and groundwater availability, mitigating water scarcity, and boosting climate resilience**.

NAMAMI GANGE PROGRAM

Context

The **National Ganga Plan (CS)** has been allocated a **financial outlay of Rs 3,400 crore** for the year 2025-26. This investment aims to enhance sewage treatment capacity, improve water quality, and regulate industrial waste discharge to rejuvenate the Ganga River and achieve prescribed bathing standards by 2025.

About Namami Gange Programme

- The Programme was launched **in 2014** as a **flagship initiative** for **Ganga conservation and rejuvenation**.
- **Vision:** The programme focuses on achieving:
 - **Aviral Dhara** (Continuous Flow)

- ▶ **Nirmal Dhara** (Unpolluted Flow)
 - ▶ **Ecological and geological integrity** of the Ganga River.
- ▣ **Key Interventions**
- ▶ **Pollution Abatement (Nirmal Ganga)** – Setting up **sewage treatment plants (STPs)** and **industrial waste management**.
 - ▶ **Improving River Flow (Aviral Ganga)** – Ensuring sustainable **water flow and conservation**.
 - ▶ **Public Engagement (Jan Ganga)** – Encouraging **community participation**.
 - ▶ **Scientific Research (Gyan Ganga)** – Promoting **research and policy** for river management.

About Ganga River basin

- The Ganga River basin is the largest in India, encompassing **27%** of the country's land mass and supporting about **47%** of its population.
- Spanning over **11 states**, the basin covers nearly **27% of India's total geographical area**.
- The majority of the basin, around **65.57%**, is used for agriculture, while water bodies cover **3.47%** of the area.
- Despite receiving **35.5%** of the total water input in terms of precipitation, the Ganga River Basin is the second most water-stressed basin in India, following the Sabarmati Basin, with only **39%** of the average per capita annual rainwater input among major Indian river basins.

POSHAN ABHIYAN

Context

Poshan Abhiyaan represents a landmark initiative in India's fight against malnutrition.

About

- Poshan Abhiyaan was launched in 2018 in Jhunjhunu district of Rajasthan.
- The focus of Abhiyaan is to lay emphasis on nutritional status of adolescent girls, pregnant women, lactating mothers and children from 0-6 years age.
- The programme, through use of technology, convergence and community involvement with a targeted approach strives to reduce the level of stunting, under-nutrition, anaemia and low birth weight in children, as also focus on adolescent girls, pregnant women and lactating mothers, thus holistically addressing malnutrition.

Objectives

- Prevent and reduce stunting in children (0- 6 years)
- Prevent and reduce under-nutrition (underweight prevalence) in children (0-6 years)

- Reduce the prevalence of anaemia among young Children(6-59 months)
- Reduce the prevalence of anaemia among Women and Adolescent Girls in the age group of 15-49 years
- Reduce Low Birth Weight (LBW)
- **Mission Poshan 2.0:** The Government of India approved "**Mission Saksham Anganwadi and Poshan 2.0**" (also referred to as Mission Poshan 2.0) which is a strategic shift in mission mode to develop practices that nurture health, wellness, and immunity from malnutrition.
- ▶ With **14,00,117 Anganwadi Centers (AWCs)** operating across **36 States/UTs and 781 districts**, the mission aims to enhance the health, wellness, and immunity of children, adolescent girls, pregnant women, and lactating mothers.

GLOBAL OBESITY EPIDEMIC (LANCET)

Context

A pair of studies published in *The Lancet* have projected that by 2050, over half of all adults (380 crore people) and one-third of all children and adolescents (74.6 crore people) worldwide will be overweight or obese. These studies provide crucial insights into the rising prevalence of obesity and overweight individuals globally, including forecasts till 2050.

Current Global Scenario

- As of 2021, **211 crore people** (45% of the global population) were overweight or obese.
- **Half of these cases were concentrated in just eight countries:** China (40.2 crore), India (18 crore), USA (17.2 crore), Brazil (8.8 crore), Russia (7.1 crore), Mexico (5.8 crore), Indonesia (5.2 crore), Egypt (4.1 crore)

Obesity in India: Alarming Trends

- ▶ **Adults (25+ years):** The number of overweight and obese adults has increased significantly since 1990. India is projected to have the **second-largest** obese and overweight adult population in 2050.
- ▶ **Older Adolescents (15-24 years):** India overtook China in 2021 as the country with the highest number of overweight and obese adolescents. This number is expected to rise further.
- ▶ **Children (5-14 years):** India is currently **second only to China** in terms of overweight and obese children. By 2050, India is expected to **narrow the gap**, with obesity levels in China stabilizing but continuing to rise in India.

NFHS Stats on India’s Obesity

- According to the **National Family Health Survey (NFHS)-5 (2019-21)**, overall, 24% of Indian women and 23% of Indian men are overweight or obese. Women who have a high-risk waist-to-hip ratio is 56.7% and in Indian men, it is 47.7%.
- In the category of ages 15-49 years, 6.4 % of women and 4.0 % of men, are obese.
- There has been an increase in the percentage of children under 5 years who are overweight (weight-for-height) from 2.1 percent in NFHS-4 (2015-16) to 3.4 percent in NFHS-5 (2019-21) at the All-India level.

How is Obesity Measured?

◦ **Traditional BMI Classification (WHO):**

- ▶ **Underweight:** BMI < 18.5
- ▶ **Normal weight:** BMI 18.5 - 24.9
- ▶ **Overweight:** BMI 25 - 29.9
 - **Obese:** BMI > 30

◦ **Issues with BMI-Based Classification:**

- ▶ Some **lean individuals** (especially in India) with normal BMI may still have excess **abdominal fat**, leading to obesity-related health issues.
- ▶ Some individuals with **high muscle mass** may have a BMI over 30 but be metabolically healthy.

◦ **New Lancet Proposal:** A new **Lancet definition (2024)** introduces two new categories:

- ▶ **Clinical Obesity:** Diagnosis based on BMI, waist circumference, muscle mass, and overall body function.
- ▶ **Pre-clinical Obesity:** Individuals with high BMI but no apparent health issues.

Body Mass Index (BMI)

- **Body Mass Index (BMI)**, previously known as the **Quetelet index**, is a simple way to check if an adult has a healthy weight.
 - ▶ It is calculated by dividing a person’s weight in kilograms by their height in meters squared (kg/m²).
 - ▶ To find BMI, take a person’s **weight (kg)** and divide it by their **height (m) squared**.
- **Healthy BMI Range:** A normal BMI falls between **18.5** and **24.9**, based on the **World Health Organization (WHO)** guidelines.

Government interventions to promote healthy lifestyle

- The Government of India has launched several initiatives to promote healthier lifestyles, better nutrition, and physical activity.

- ▶ Fit India Movement
- ▶ National Programme for Prevention and Control of Non-Communicable Diseases (NP-NCD)
- ▶ POSHAN Abhiyaan
- ▶ Eat Right India
- ▶ Khelo India
- ▶ National Health Mission
- ▶ FSSAI’s ‘Aaj Se Thoda Kam’ Campaign
- ▶ FSSAI’s **RUCO (Repurpose Used Cooking Oil)** initiative
- ▶ Regulating High Fat, Salt, and Sugar (HFSS) Foods

INTERNATIONAL WOMEN’S DAY (IWD)

Context

International Women’s Day (IWD) is observed on **8th March** every year to recognize and celebrate the achievements of women across different fields—education, politics, economy, culture, and beyond. The theme this year is “**For ALL Women and Girls: Rights. Equality. Empowerment.**” This year marks the **30th anniversary of the Beijing Declaration and Platform for Action (1995)**—a major global commitment to women’s rights.

Key Government Initiatives for Women

Education & Skill Development	<ul style="list-style-type: none"> ◦ Beti Bachao Beti Padhao – Promotes education for girls. ◦ Right to Education Act (2009) – Ensures free schooling for all children. ◦ National Education Policy 2020 – Focuses on gender equality in education. ◦ Women in STEM (Science, Tech, Engineering, Math) – 42.57% of students in STEM fields are women. ◦ Pradhan Mantri Kaushal Vikas Yojana (PMKVY) – Provides vocational training for women.
Health & Nutrition	<ul style="list-style-type: none"> ◦ Pradhan Mantri Matru Vandana Yojana – Financial support for pregnant women. ◦ Maternal Mortality Rate (MMR) has dropped significantly. ◦ Jal Jeevan Mission – Clean drinking water to 15.4 crore households. ◦ Ujjwala Yojana – 10.3 crore free LPG connections for clean cooking.

Financial Inclusion & Economic Empowerment	<ul style="list-style-type: none"> ◦ PM Jan Dhan Yojana – 30.46 crore women opened bank accounts. ◦ MUDRA Scheme – 69% of microloans granted to women entrepreneurs. ◦ Stand-Up India – Loans for women-led businesses. ◦ Women in Leadership – More women in the armed forces, aviation, and corporate leadership.
Digital & Technological Empowerment	<ul style="list-style-type: none"> ◦ PMGDISHA – Digital literacy for 6 crore people. ◦ Common Service Centres (CSCs) – 67,000 women-run digital centers. ◦ SANKALP Hubs – Digital and tech training for women in 742 districts.
Safety & Protection	<ul style="list-style-type: none"> ◦ Stronger Laws – Protection from domestic violence, sexual harassment, dowry, and child marriage. ◦ Nirbhaya Fund – ₹11,298 crore allocated for women's safety. ◦ Fast Track Special Courts – Handling cases of sexual violence quickly. ◦ Women Help Desks – Established in 14,658 police stations.

DISTRICT-LEVEL GDP ESTIMATION

Context

The **District Domestic Product (DDP) estimation** has gained attention as the government pushes for **district-centric economic planning**. Prime Minister **Narendra Modi has emphasized the role of districts** in driving economic growth, but **lack of accurate district-level GDP estimates** has hindered effective policy-making.

Current GDP Estimation in India

- India's GDP is estimated based on three sectors:
 - ▶ **Primary Sector** (Agriculture, Forestry, Mining) – **Bottom-up approach**, aggregating district-level data.
 - ▶ **Secondary Sector** (Manufacturing, Construction, Utilities) – **Top-down approach**, distributing national estimates based on employment or infrastructure indicators.

- ▶ **Tertiary Sector** (Services like Trade, Banking, Transport) – Also **top-down**, relying on proxy indicators.

Issues with Current Methodology

- ▶ **Top-down estimation** does not reflect **actual district-level economic activity**.
- ▶ **Lack of real-time economic data**, especially in the **unorganized sector**.
- ▶ **State-level GDP (GSDP) estimations** may **misrepresent local realities**, as seen in **UP's case during COVID-19**.
- ▶ **One-size-fits-all policies** ignore **regional economic strengths and weaknesses**.

PI DAY

Context

March 14 is commonly referred to as Pi Day, a day that aims to celebrate the ratio of the circumference of a circle.

About

- The number is known as **3.14 or π** and can actually go on forever.
- The most accurate value for Pi, according to **Guinness World Records**, is more than 62 trillion digits (62,831,853,071,796 to be precise), calculated in August 2021 by the **University of Applied Sciences** in Switzerland.

RECIPROCAL TARIFFS

Context

US will impose reciprocal tariffs on all countries, including India. This means India will face higher duties on its exports to the US, affecting key industries.

What are Reciprocal Tariffs?

- Reciprocal tariffs ensure fair trade by matching the import duties imposed by other countries.
- If a country charges high tariffs on US goods, the US will impose the same level of tariffs on that country's exports.
- The goal is to prevent unfair advantages and create a balanced trading system.

How does this affect India?

- Trump has criticized India for imposing over 100% tariffs on US automobile exports. India is **one of the most affected countries** due to its high tariff gap with the US.
- Sectors like **gems & jewellery, automobiles, chemicals, and pharmaceuticals** will be hit hardest.
- India could **lose up to USD 7 billion per year** due to reduced exports.

- This could **slow down GDP growth** by **5-10 basis points** in FY 2025-26.

What does India export to the US?

- **Total exports (2024): USD 74 billion**
- **Key exports at risk:**
 - ◆ Pearls, gems, and jewellery: **USD 8.5 billion**
 - ◆ Pharmaceuticals: **USD 8 billion**
 - ◆ Petrochemicals: **USD 4 billion**

IRCTC & IRFC GET NAVRATNA STATUS

Context

The government granted **Navratna status** to **IRCTC** and **IRFC**, making them the **25th and 26th Navratna CPSEs**. Now, **all seven listed Indian Railways CPSEs** hold **Navratna status**.

What is Navratna Status?

- Navratna status is conferred upon **public sector undertakings** that demonstrate outstanding financial and market performance. This recognition enhances their autonomy and financial authority.
- It is a **prestigious rank** for **government-owned companies**, placed **between Maharatna & Miniratna** categories.
- To qualify, a company must have:
 - A **composite score of 60+** on key financial indicators.
 - An **'Excellent' or 'Very Good' rating** in 3 of the last 5 years.

Benefits of Navratna Status

- **More Financial Autonomy** – Companies can invest **Rs 1,000 Cr or 15% of net worth** in projects without government approval.
- **Flexibility in Business** – They can **form joint ventures, acquire companies**, and expand globally.
- **Better Market Position** – They attract more investors due to improved credibility.



FACT BOX

Classification of CPSEs

- The Centre classifies CPSEs into three categories based on their financial performance and operational capabilities:
 - Maharatna
 - Navratna
 - Miniratna

Maharatna CPSEs

- A company that already holds **Navratna** status can be considered for **Maharatna** status if it meets certain financial criteria.
- It must be listed on **Indian stock exchanges** and comply with shareholding norms.
- Over the last three years, its average annual **turnover should exceed Rs 25,000 crore, net worth should be above Rs 15,000 crore, and net profit should be more than Rs 5,000 crore.**
- **Examples:** Bharat Heavy Electricals Limited (BHEL), Bharat Petroleum Corporation Limited (BPCL), Coal India Limited, Gas Authority of India Limited (GAIL), Hindustan Petroleum Corporation Limited (HPCL), Indian Oil Corporation (IOC), NTPC, and Oil and Natural Gas Corporation (ONGC).

Miniratna CPSEs

- Miniratna companies are further divided into **Miniratna-I and Miniratna-II categories.**
 - **Miniratna-I:** A company can be granted Miniratna-I status if it has been profitable for the last three years and has a pre-tax profit of at least Rs 30 crore in one of these years.
 - **Miniratna-II:** Miniratna-II companies are those that have made profits for the last three years but do not meet the higher financial requirements of Miniratna-I.
 - These companies have **limited financial autonomy** but can make independent investment decisions up to a certain limit.

HYPERTRICHOSIS (WEREWOLF SYNDROME)

Context:

Lalit Patidar, an 18-year-old from Madhya Pradesh, has been recognized by the **Guinness World Records** for having the **hairiest face on a male**, with an astonishing **201.72 hairs per square centimetre**. His condition, **hypertrichosis**, commonly referred to as **"werewolf syndrome,"** is an extremely rare disorder, with only about **50 documented cases** since the Middle Ages.

What is Hypertrichosis (Werewolf Syndrome)?

- Hypertrichosis is a **rare genetic or acquired disorder** characterized by **excessive hair growth** on the body, including areas where hair is not typically present.
- It can occur in both males and females.
- It is categorized into two main types:
 - **Generalized Hypertrichosis** – Excessive hair growth all over the body.

- ▶ **Localized Hypertrichosis** – Hair growth is restricted to specific areas.

Causes of Hypertrichosis:

- ▶ **Congenital Hypertrichosis** – Present from birth due to genetic mutations.
- ▶ **Acquired Hypertrichosis** – Develops later in life due to conditions like cancer, certain medications, or hormonal imbalances.

NAVIKA SAGAR PARIKRAMA-II

Context

INSV Tarini, carrying two women Indian Navy officers, **Lieutenant Commander Dilna K. and Lieutenant Commander Roopa**, has departed from **Port Stanley (Falkland Islands) to Cape Town, South Africa**, as part of the **Navika Sagar Parikrama-II** global circumnavigation expedition.

About INSV Tarini

- INSV Tarini is a **56-foot-long sailing vessel**, built by **Aquarius Shipyard Limited**.
- It was **inducted into the Indian Navy on February 18, 2017**.
- This is its **second global circumnavigation mission**, reinforcing the Navy's focus on **women-led maritime expeditions**.



FACT BOX

Important Points

- The circumnavigation will cover around 23,000 nautical miles in around 240 days, across four continents through three oceans and three challenging capes unfolding in five legs with stopovers at four ports for replenishment and maintenance.
- The five legs are **Goa to Fremantle, Australia; Fremantle to Lyttleton, New Zealand; Lyttleton to Port Stanley, Falkland; Port Stanley to Cape Town, South Africa and from Cape Town back to Goa**.

Point Nemo

- INSV has successfully passed through **Point Nemo**.
- Point Nemo is the **Oceanic Pole of inaccessibility (extreme remoteness)**, with the closest human presence often being aboard the **International Space Station (ISS)** orbiting above.
- Additionally, Point Nemo serves as a decommissioned spacecraft cemetery, where space agencies have intentionally directed **defunct satellites** and space stations to re-enter Earth's atmosphere and fall into the ocean, minimising the risk to human populations, the official observed.
- The **Spanish research vessel Hespérides** in 1999 had become the first ship to sail to Point Nemo.

AI KOSHA AND GPU ACCESS PORTAL

Context

The **Ministry of Electronics and IT (MeitY)** has launched **AI Kosha**, a platform that provides **non-personal datasets** to startups and researchers. This will help them develop **AI technologies like large language models (LLMs)**. Additionally, the government has introduced the **IndiaAI Compute Portal**, which gives **access to powerful GPUs (graphics processing units)** needed for AI research.

What is AI Kosha?

- **AIKosha or IndiaAI Datasets Platform (IDP)** is a platform that will provide computing, datasets, tools, and a secure sandbox environment to India's researchers, entrepreneurs, and startups, helping them build state-of-the-art AI applications and solutions.
- In simple terms, the IDP is a **repository** where people can find a variety of datasets, models, and examples to support AI innovation.
- It also includes tools and tutorials in a development environment called an AI sandbox.
- AI Kosha is part of the **IndiaAI Mission**, which aims to support AI development in India.
- The platform will initially offer data from government ministries, with more datasets added over time.
- The IndiaAI Compute Portal will allow researchers to use high-performance **GPUs from companies like NVIDIA, AMD, Intel, and AWS**.

IndiaAI Mission

- The IndiaAI Mission, approved in March 2024, is a landmark initiative dedicated to fortifying India's AI ecosystem through strategic programs and partnerships spanning both public and private sectors.
- With a vision to democratize AI access, enhance data quality, cultivate indigenous AI **capabilities**, and **ensure ethical AI practices**, the Mission is structured around seven core pillars:
 - ▶ IndiaAI Compute
 - ▶ IndiaAI Datasets Platform
 - ▶ IndiaAI Application Development Initiatives
 - ▶ IndiaAI FutureSkills
 - ▶ IndiaAI Innovation Center
 - ▶ IndiaAI Startup Financing
 - ▶ Safe & Trusted AI

SPACE DOCKING

Context

ISRO successfully **undocked two satellites** in space, nearly **two months after** its first **docking mission (Spadex)**. This

makes **India the fourth country** (after the **US, Russia, and China**) to achieve **docking-undocking capabilities**.

What is Space Docking?

- **Docking** is the process of bringing **two fast-moving spacecraft** into the **same orbit**, moving them **closer**, and finally **joining them together**.
- It is **essential** for missions involving **heavy spacecraft, space stations, and sample return** missions.
- **Why is Docking-Undocking Important?**
 - **It enables assembly of large spacecraft in orbit** (reducing launch weight constraints).
 - **It is critical for space stations** (India plans to have its **own space station by 2035**).
 - **It is essential for lunar missions** (e.g., **Chandrayaan-4's sample return mission**).
 - **It supports human spaceflight missions** (India aims to send **astronauts to the Moon by 2040**).

Unique ISRO's Docking System

- **Androgynous design** (both satellites have identical docking mechanisms).
- Uses **only two motors**, unlike the **24-motor** system on the **International Space Station (ISS)**.

India's Spadex Mission

- **Launched:** 2024.
- **Satellites:**
 - **SDX01 (Chaser)**
 - **SDX02 (Target)**
- **Orbit:** 470 km circular orbit.
- **Procedure:**
 - Satellites started **20 km apart**.
 - They were **progressively brought closer** and then **docked**.
 - After docking, ISRO demonstrated **power sharing** and **composite control**.
- **Undocking Date:** March 2025 (after two months of simulations).

UNIYALA KERALENSIS

Context

A new plant species, **Uniyala keralensis**, has been discovered in the **Agasthyamala Biosphere Reserve, Kerala**. This species belongs to the **Asteraceae family** and is **endemic to southwest India**.

About the Species

- **Scientific Name:** *Uniyala keralensis*
- **Family:** Asteraceae

- **Genus:** **Uniyala**, which was earlier part of *Vernonia*.
- **First Collected:** 1998; initially mistaken for *Vernonia multibracteata*.
- **Habitat:** Found in **open areas of the western mountain slopes** of the Agasthyamala Biosphere Reserve at **700-1,400m elevation**.
- **Population:** Around **5,000 individuals** spread across **250 km²** in four subpopulations.
- **Conservation Status:** **Data Deficient (DD)** under IUCN Red List (2024).
- **Physical Characteristics**
 - **Type:** **Shrub**, growing **1-3 meters** tall.
 - **Flowers:** **Light purple florets**, blooming **August to April**.
 - **Leaf Features:**
 - ◆ **Larger leaves** than other Uniyala species.
 - ◆ **Long petioles** (stalk joining leaf to stem).
 - ◆ **Fewer lateral veins** compared to *Uniyala comorinensis* and *Uniyala salviifolia*.

SMOOTH-COATED OTTERS (LUTROGALE PERSPICILLATA)

Context

Two smooth-coated otters, a species that was last seen in 2004 at the Delhi zoo, are among several animals that are set to arrive in Delhi in a slew of exchanges with zoological parks located across the country.

About Smooth-Coated Otter (*Lutrogale perspicillata*)

- The Smooth-coated otter is an otter species found in most of the Indian subcontinent and Southeast Asia.
- They are named for their **sleek, smooth fur**, which distinguishes them from other otter species.
- They have small eyes and ears, strong limbs, a flattened tail, and large, well-webbed paws that make them excellent swimmers.
- **Habitat and Distribution:** These otters are typically found in freshwater habitats such as rivers, lakes, and wetlands.
 - In India, they are seen in regions like **Corbett, Dudhwa, Katarniaghat, Kaziranga, Sunderbans, Bhitarkanika, Coringa, Periyar, and Nagarhole**.
- These otters are **social animals**, often living in small family groups consisting of a mated pair and their offspring.
- **IUCN Red List:** Vulnerable
- Smooth-coated otters are protected under the **Wildlife Protection Act, 1972** in India.

MYCELIUM BRICKS

Context:

With rising concerns about climate change, the construction industry is exploring sustainable alternatives to reduce its carbon footprint. A significant focus is on **mycelium bricks**, an innovative bio-material derived from fungi, which could potentially replace conventional fired clay bricks.

About Mycelium Bricks:

- Mycelium is the **vegetative part of fungi**, composed of branching filaments.
- Mycelium bricks are made by combining **sawdust, husk, and fungal spores**, which solidify into a lightweight, fibrous network.
- **Advantages of Mycelium Bricks**
 - ▶ **Sustainability:** They are fully biodegradable and has a lower carbon footprint than traditional bricks.
 - ◆ **Traditional brick production** emits nearly 300 million tonnes of CO₂ annually.
 - ▶ **Lightweight:** They are easier to transport and handle.
 - ▶ **Fire Resistance:** They are naturally fire-resistant, reducing fire hazards.
 - ▶ **Good Insulation:** They offer better heat insulation than conventional bricks.
 - ▶ **Versatile Uses:** Potential applications in interior design, liquid filtration, circuit boards, and sports equipment.



Challenges of Mycelium Bricks

- ▶ **Structural Strength:** Lower load-bearing capacity compared to concrete and fired bricks.
- ▶ **Moisture Sensitivity:** Highly absorbent and prone to fungal decay in humid environments.
- ▶ **Durability Issues:** Biodegrades within a few years, requiring further treatment.
- ▶ **Production Constraints:** Large-scale manufacturing is currently expensive due to limited infrastructure.
- ▶ **Market Acceptance:** Consumer skepticism and lack of awareness about its long-term viability.

India-Specific Concerns

- ▶ **Tropical Climate:** High humidity and monsoons increase susceptibility to moisture damage.
- ▶ **Termite Vulnerability:** Unlike synthetic materials, mycelium is prone to pest attacks.
- ▶ **Higher Costs:** Limited production facilities make it a costly alternative for now.

TRIBAL RIGHTS VS. TIGER CONSERVATION IN SIMILIPAL

Context

The **Union Ministry of Tribal Affairs** has asked the Odisha government to check if proper legal procedures were followed when evicting villagers from Jamunagarh inside **Similipal Tiger Reserve (STR)**. The villagers claim their sacred groves and burial grounds were destroyed to create an enclosure for a tiger named Zeenat.

What Happened?

- Zeenat, a tiger from **Maharashtra's Tadoba-Andhari Tiger Reserve**, was relocated to **Similipal** to increase genetic diversity among tigers.
- Meanwhile, villagers allege that their sacred sites were bulldozed for Zeenat's enclosure and that they were forcibly evicted between 2015 and 2022 without proper consent.
- **Government Response**
 - ▶ The Ministry has asked Odisha officials to check if the villagers' rights under the **Forest Rights Act (FRA), 2006**, were respected.
 - ▶ It has also asked whether villagers were consulted and if any study was conducted to assess whether they posed a threat to wildlife.
 - ▶ If resettlement was necessary, the Ministry insists it must follow legal procedures and ensure affected villagers' livelihoods.

Why It Matters?

- Tribal population in Odisha constitutes 22.85%, facing economic challenges and decreasing land ownership.
- This case highlights the conflict between wildlife conservation and tribal rights. The government aims to protect tigers, but tribal communities argue their rights and cultural heritage must not be ignored. Experts stress that for conservation to succeed, local people must support and understand the process.

Tribal Rights in India

Constitutional Protection for Tribal Rights

- ▶ **Schedule 5 & 6:** These schedules protect tribal land and governance structures in specific regions.

- ▶ **Article 342 (1&2):** Defines and recognizes Scheduled Tribes (STs) in different states and union territories.
- ▶ **Part X of the Indian Constitution:** Grants Scheduled Tribes a right to self-determination and safeguards against exploitation.
- **Forest Rights Act, 2006 (FRA):** The **Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006** recognizes and protects the rights of forest-dwelling tribal communities. It was enacted to correct historical injustices faced by these communities.
 - ▶ Eligibility:
 - ◆ **Forest Dwelling Scheduled Tribes (FDSTs):** Tribes listed as STs in an area under Indian law.

- ◆ **Other Traditional Forest Dwellers (OTFDs):** Communities residing in forest lands for at least three generations (75 years) before December 13, 2005, and depending on forests for livelihood.
- ▶ Key Rights under the Forest Rights Act
 - ◆ Land Rights
 - ◆ Community Rights
 - ◆ Rights over Biodiversity
 - ◆ Rehabilitation in Case of Displacement
 - ◆ **Other Rights**
 - ◆ Right to convert forest villages into revenue villages for administrative purposes.
 - ◆ Right to develop necessary infrastructure like schools, hospitals, and roads in forest areas.
 - ◆ Right to protect and conserve community forest resources.





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