

UPSC
Prelims Cum Mains Based
News Summary

Current
Affairs

OCTOBER - 2025

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UPSC Current Affairs

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POLITY & GOVERNANCE

A 100-Year Journey of UPSC: Guardian of Meritocracy

Source: New Indian Express

UPSC Relevance: GS2 Polity and Governance

Context: 100-Year of UPSC

Why in News?

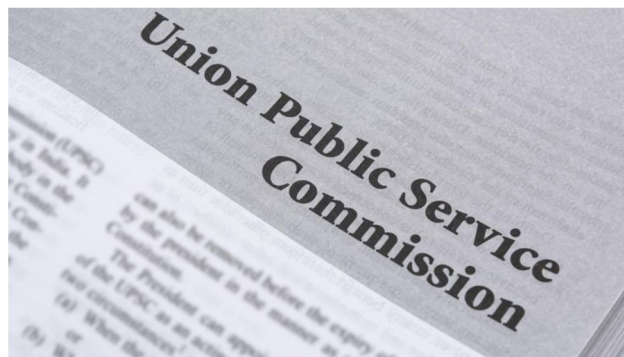
The Union Public Service Commission (UPSC) celebrates 100 years of merit-based recruitment, upholding trust, integrity, and fairness in India's civil services.

Introduction

- On October 1, 2025, the **Union Public Service Commission (UPSC)** marked its **centenary year**, completing a remarkable journey as the *guardian of meritocracy* in India's governance.
- Established in **1926** under the recommendations of the **Lee Commission (1924)** and initially called the **Public Service Commission**, it evolved through colonial and constitutional transformations to become the **UPSC** after the adoption of the Constitution in **1950**.
- For the past **100 years**, the UPSC has stood as an enduring pillar of **fairness, trust, and integrity** in public recruitment, ensuring that access to India's higher civil services is determined by **merit alone**.
- This journey reflects not only the evolution of an institution but also the **democratic aspiration** of India to build an **impartial and efficient civil service** capable of serving governments of all political orientations.

About Union Public Service Commission (UPSC)

- The **Union Public Service Commission (UPSC)** is India's premier central recruitment agency responsible for selecting candidates for **All India Services, Central Services, and Group A and B posts** in the Government of India.
- It acts as the **guardian of meritocracy**, ensuring fair and transparent recruitment based on ability, knowledge, and competence.



(Image Source: The Hindu)

Historical Evolution:

- The **Government of India Act, 1919**, first envisaged the idea of an independent recruitment body to secure an efficient and impartial civil service.
- Acting on the **Lee Commission's** recommendation that democratic governance required protection of civil services from political or personal influences, the British established the **Public Service Commission** in **October 1926**, with **Sir Ross Barker** as its first chairman.
- Initially endowed with **limited powers**, it functioned as an experiment in a colonial setup. The **Government of India Act, 1935**,

further elevated it to the **Federal Public Service Commission**, providing Indians with a more significant role in administration.

- After Independence, under **Articles 315–323 of the Indian Constitution**, it became the **Union Public Service Commission (UPSC)**, tasked with recruitment, promotion, and disciplinary oversight of the **Central Civil Services**.

The Pillars of UPSC: Trust, Integrity, and Fairness

The success and credibility of the UPSC have been built on **three core principles**:

- **Trust** – Millions of aspirants over decades have reposed faith that the Commission's processes ensure equal opportunities irrespective of socio-economic background.
- **Integrity** – The UPSC has protected its processes from **political or external pressures**, maintained confidentiality, and upheld **merit-based selection**.
- **Fairness** – By providing candidates the freedom to choose among **48 subjects** for the Mains examination and write in **English or any of the 22 constitutionally recognised languages**, the UPSC has truly created a **level playing field** in a country marked by diversity and inequality.
- This commitment to fairness reflects the philosophy of the **Bhagavad Gītā's verse**, "*Tasmad asaktaḥ satataṁ kāryaṁ karma samācara...*", which inspires the UPSC to perform its duty "**without attachment to outcomes, with rigour and impartiality.**"

Managing Scale and Complexity: A Global Benchmark

- Today, the UPSC conducts the **Civil Services Examination (CSE)**—the **world's largest competitive examination**—with remarkable precision and consistency.

- Every year, about **10–12 lakh candidates** apply for the Preliminary Examination.
 - The Preliminary stage is conducted across **2,500+ centres nationwide**, followed by the Mains examination with **48 optional subjects**.
 - The evaluation process is **anonymous**, with answer scripts assessed by leading experts in respective disciplines and languages.
 - Special arrangements are made for **differently-abled candidates**.
- Even during crises like the **COVID-19 pandemic**, the UPSC maintained its **defined timelines** without disruption, demonstrating its ability to **orchestrate a seamless and equitable process**.

Championing Diversity: The 'Indian Dream'

- The CSE, once dominated by candidates from **urban elite backgrounds**, now attracts aspirants from **nearly every district in India**, including the most **remote and underprivileged regions**.
- This expanding diversity reflects the "**Indian Dream**" – the belief that **talent, hard work, and commitment** can open doors to opportunity for all, regardless of birthplace, class, or linguistic background.
- By ensuring equal access, the UPSC has played a transformative role in making the civil services a true mirror of **India's demographic diversity**, thus strengthening democratic governance.

Unsung Heroes Behind the Institution

- While candidates and successful civil servants often receive public recognition, the **faceless contributors**—the **paper setters, evaluators, and administrative staff**—are the silent backbone of the UPSC's operations.
- These **academic experts and administrators**

work with **selfless dedication** to maintain the **integrity, fairness, and rigour** of the examinations.

Reforms for the Future: Adapting to New Challenges

- Entering its **centenary year**, the UPSC has embraced **technological and procedural reforms** to remain current in the face of global competition and governance challenges:
 - **Online application portals** for ease of access.
 - **Face-recognition technology** to prevent impersonation.
 - The **PRATIBHA Setu Initiative** to support candidates who reach the interview stage but miss final selection, enabling them to find suitable employment.
- Plans to integrate **AI and digital technologies** for more efficient recruitment without compromising on **integrity and fairness**.

Contribution to Nation-Building

- Across decades, UPSC-selected civil servants have:
 - Administered during **national crises**,
 - Guided **economic reforms**,
 - Overseen **infrastructure development and environmental management**, and
 - Contributed silently to **nation-building** at every level of governance.
- Their **professionalism and dedication**—nurtured through the UPSC's merit-based selection—have been instrumental in **upholding public trust in India's bureaucracy**.

Conclusion:

- As the UPSC celebrates **100 years**, it

reaffirms its **resolve to uphold the “gold standard” of integrity, fairness, and excellence** in public recruitment.

The Crisis of Journalism: Challenges, Causes, and the Way Forward

Source: The Hindu

UPSC Relevance: **GS2 Polity and Governance**

Context: Indian Knowledge Systems

Why in News?

Journalism faces a systemic crisis due to shrinking access to information, weakening public-funded media, dominance of state-aligned narratives, and financial unsustainability of public-interest reporting.

Introduction

- The Journalism is often referred to as the “*fourth pillar of democracy*” because it mediates between the state and the public, ensuring transparency, accountability, and informed citizenship.
- However, in recent years, journalism worldwide-and in India-has been undergoing a profound crisis.
- This crisis is **not merely about individual journalists or platforms**; it is **systemic**, shaped by political, economic, and technological changes that are redefining how information flows and who controls it.

Key Issues Highlighted in the Article

Declining Role of ‘Sources’

- Traditionally, unnamed whistleblowers - or “sources” — challenged official narratives, exposing corruption and abuse of power.
- Today, many ‘sources’ merely *amplify the state’s official narrative*, branding critics as “foreign agents” or “anti-national,” thereby

undermining journalism's accountability role.

Reduced Access to Official Information

- The executive branch across countries such as the **U.S., U.K., Israel, and India** has consolidated power, often citing *national security* to limit transparency.
- Even parliamentary questions and judicial submissions increasingly focus on concealing rather than revealing facts.

Bypassing of Mass Media

- **Social media platforms** allow political leaders, corporations, and institutions (the "*principals*" of news) to communicate **directly with the public**.
- This reduces the traditional **mediating role of journalists**, as the public perceives direct communication as more authentic.
 - **Fragmentation of Journalistic Models**
 - Some journalists join **majoritarian populist narratives** to secure revenues and patriotism badges.
 - Others adopt **counter-propaganda models** or rely on **open-source intelligence (OSINT)** and ground reporting to maintain independence.
 - Example: *The Hindu's* investigation into manipulation of voter lists in Aland, Karnataka.

Economic Sustainability Challenge

- Quality investigative journalism requires **courage, capacity, and capital**.
- Profit-driven media rarely funds public-interest reporting due to high costs and low commercial returns.

Weakening of Public-Funded Media

Public broadcasters face crises worldwide:

- **BBC's** income declined by £1 billion (adjusted for inflation) since 2010.
- **NPR (USA)** faces existential funding threats.
- In India, **Prasar Bharati** never achieved autonomy and has become a government mouthpiece.

- Populist politics often delegitimizes publicly funded media, labelling it as a "*scandal*" or "*biased*."



(Image Source: The Hindu)

Structural Causes of the Crisis

Political Centralisation of Power

- Governments invoke **national security laws** to restrict information and intimidate whistleblowers.
- Whistleblower protections remain weak (e.g., **Whistle Blowers Protection Act, 2014** in India is poorly implemented).

Technological Disruption

- The rise of **social media and digital platforms** has:
 - Reduced reliance on traditional media.
 - Fragmented audiences.
 - Created an environment ripe for misinformation and propaganda.
- **Economic Pressures**
 - Declining advertisement revenue for newspapers due to competition from **digital platforms** (Google, Meta, etc.).
 - Shift toward **subscription and paywall models** excludes lower-income groups, weakening inclusivity.
 - **Profit-driven capitalism** struggles to sustain investigative reporting.
- **Erosion of Public Trust**
 - Perceptions of media being **biased or captured by political and corporate interests**.
 - Spread of fake news and polarising

content diminishes the credibility of mainstream media.

- **Global Trends:** Similar trends in Israel, U.K., U.S. show that this is not confined to India; it's a worldwide challenge tied to the rise of **strong executives and populism**.

Implications of the Crisis

- **Democratic Backsliding:** Without a robust, independent press, **executive power goes unchecked**, undermining democratic accountability.
- **Informed Citizenship at Risk:** Citizens lose access to **verified, fact-based reporting**, impacting public debate and decision-making.
- **Rise of Propaganda and Polarisation:** Information ecosystems become dominated by **partisan or state-aligned narratives**.
- **Threat to Investigative Journalism:** Lack of funding and institutional support limits exposure of corruption, human rights violations, and systemic issues.
- **Weakening Public-Funded Institutions:** Diminished autonomy of broadcasters like **Prasar Bharati** reduces diversity of viewpoints.

Case Studies

- **India:**
 - Prasar Bharati's lack of autonomy has restricted its credibility.
 - Investigations like *The Hindu's Aland voter list story* show the potential of open-source journalism despite constraints.
- **Global:**
 - BBC's budget cuts (£1 billion loss since 2010).
 - NPR (USA) faces funding crises; public distrust is rising.

Way Forward

A multi-pronged approach is essential to address this systemic crisis:

1. Legal and Policy Reforms

- Strengthen **Right to Information (RTI)** laws and whistleblower protection.
- Ensure **statutory autonomy** for public broadcasters like Prasar Bharati.
- Enforce **transparency in political advertising and digital content regulation**.

2. Financial Models for Public-Interest Journalism

- Establish **publicly funded grants or endowments** for investigative journalism.
- Encourage **non-profit newsrooms** (like *ProPublica* in the U.S.).
- Tax incentives for philanthropic contributions to independent media.

3. Technological Adaptation

- Invest in **data journalism, fact-checking platforms, and OSINT skills**.
- Enhance **digital literacy among citizens** to counter misinformation.

4. Institutional Rebuilding

- Revive **public broadcasters** with guaranteed independent funding (similar to the BBC charter model).
- Promote **media diversity** to counter monopolisation by wealthy owners.

5. Ethical Standards and Capacity Building

- Regular **training for journalists** in investigative methods and data-driven reporting.
- Uphold **ethical journalism codes** to regain public trust.

Conclusion:

- Journalism's crisis is deeply intertwined with the **political centralisation of power, economic pressures, and technological shifts**.

SC allows junior judges to be directly elevated as district judges

Source: The Hindu

UPSC Relevance: GS 2 Polity and Governance

Context: District judges - Supreme Court of India

Why in News?

The Supreme Court of India, in *Rejanish KV vs K Deepa* (2025), ruled that serving judicial officers can directly compete for district judge posts, overturning earlier precedents that restricted this route to advocates.

Introduction

- In a landmark verdict on October 9, 2025, the Supreme Court of India, through a five-judge Constitution Bench led by Chief Justice of India B.R. Gavai, ruled that judicial officers serving in the subordinate judiciary are eligible to compete for the post of district judge through **direct recruitment**.
- This ruling overturns previous Supreme Court precedents that had restricted this channel exclusively to advocates with at least seven years of experience at the bar.
- The judgment, delivered in the case of *Rejanish KV vs K Deepa*, reinterprets **Article 233 of the Constitution**, redefining the eligibility framework for higher judicial appointments.



(Image Source: Indian Express)

Background

- Traditionally, the career path for district judges in India has been bifurcated:
 - Advocates:** Eligible for direct recruitment after seven years of practice.
 - Lower Court Judges:** Civil judges or judicial magistrates could ascend to district judge positions only through promotion based on seniority or limited competitive examinations.
- The case arose when Rejanish KV, initially a practising lawyer who qualified under the direct recruitment quota, became a junior judge in Kerala. His subsequent appointment as a district judge raised a legal question: could a serving judicial officer still compete under the advocate quota?
- The Kerala High Court annulled his appointment, citing the Supreme Court's 2020 decision in *Dheeraj Mor vs High Court of Delhi*, which barred judicial officers from direct recruitment.

Subordinate Judiciary in India:

- Subordinate courts constitute the lower tier of a state's judicial system, operating under the supervision of the respective **High Court**.
- They primarily function at the district and sub-district levels, ensuring access to justice for civil and criminal matters.
- Constitutional Basis:** The organization, powers, and independence of subordinate courts are enshrined in **Articles 233 to 237 of Part VI** of the Constitution. These provisions aim to maintain judicial independence from the executive while outlining the framework for appointments and functioning.

Appointment of Judges:

- District Judges:** Appointed, posted, and promoted by the **Governor** in consultation with the **High Court**.
- Other Judicial Officers (below District Judge):** Appointed by the Governor after

consulting both the **State Public Service Commission** and the **High Court**.

Eligibility for District Judge:

- Must not be in central or state government service at the time of appointment.
- Must have served as an advocate or pleader for at least **seven years**.
- Must be **recommended by the High Court**.

Control and Supervision: The **High Court** exercises administrative control over subordinate courts, including postings, promotions, and leave of judicial officers below the level of District Judge.

Structure and Jurisdiction: While specific titles and structures vary across states, the subordinate judiciary generally follows a **three-tier system**:

1. District and Sessions Courts:

- Highest judicial authority at the district level.
- Exercises both **original and appellate jurisdiction** in civil and criminal matters.
- Sessions Judges can impose **life imprisonment or death penalty**, with death sentences requiring **High Court confirmation**.

2. Subordinate Civil and Criminal Courts:

- **Civil Side:**
 - Subordinate Judges: Unlimited pecuniary jurisdiction.
 - Munsiffs: Limited pecuniary jurisdiction.
- **Criminal Side:**
 - Chief Judicial Magistrate: Cases punishable up to 7 years of imprisonment.
 - Judicial Magistrate: Cases punishable up to 3 years of imprisonment.

3. Special Courts:

- **Metropolitan Areas:** City civil courts handle civil matters; metropolitan magistrate courts deal with criminal matters.

- **Small Causes Courts:** Handle low-value civil cases summarily; decisions are final but subject to **High Court revision**.
- **Panchayat Courts (e.g., Nyaya Panchayats, Gram Kutchery):** Deal with petty civil and criminal cases in rural areas.

Supreme Court's Ruling

The Constitution Bench Re-examined Article 233(2), which states that "a person not already in the service of the Union or of the State" shall be eligible for direct recruitment as a district judge only if they have seven years of practice at the bar.

- **Majority Opinion (CJI Gavai et al.):** The court held that the earlier interpretation was narrow and incorrect. The clause sets a minimum qualification for bar candidates but does **not prohibit serving judicial officers** from competing. Excluding them was discriminatory and undermined the objective of attracting the best talent to the higher judiciary. The bench emphasized that judicial experience is invaluable and broadens the talent pool.
- **Concurring Opinion (Justice Sundresh):** Justice Sundresh highlighted the principle of **judicial independence** and the doctrine of **constitutional silence**, arguing that the framers deliberately left eligibility criteria for judicial officers open-ended. An absolute bar would create an unconstitutional quota for advocates, violating **Article 14**.
- **Overruling Precedent** The bench overruled a long line of prior decisions, including:
 - *Satya Narain Singh vs High Court of Judicature at Allahabad* (1984, 2-judge bench)
 - *Dheeraj Mor vs High Court of Delhi* (2020, 3-judge bench)

- The bench reasoned that these decisions had caused **decades of injustice** to judicial officers and failed to align with the Constitution's text and public interest.
- **Key Directives and Changes**
 - **Eligibility:** Serving judicial officers can now apply under direct recruitment.
 - **Experience Requirement:** A minimum of **seven years continuous experience** is mandatory, which can include both years as a practising advocate and as a judicial officer. Gaps in continuous professional association render candidates ineligible.
 - **Minimum Age:** Uniform **35 years** for all candidates.
 - **Assessment:** Eligibility is assessed at the **time of application**, not appointment.
 - **State Amendments:** All state governments and High Courts must amend judicial service rules within three months.
 - **Prospective Application:** The ruling applies only to future recruitments and not retroactively.
- **Implications**
 - **Merit-Based Selection:** Expands the talent pool and fosters **healthy competition** between advocates and judicial officers.
 - **Judicial Efficiency:** Experienced lower court judges bring practical insights, potentially enhancing the quality and efficiency of district judiciary functioning.
 - **Equality and Non-Discrimination:** Upholds **Article 14** by removing an arbitrary bar based solely on professional status.
 - **Policy Reform:** Sets a precedent for

uniform eligibility criteria and more transparent recruitment practices in higher judiciary appointments.

Conclusion:

- The Supreme Court's decision marks a transformative step in India's judicial recruitment framework, aligning with the constitutional mandate of equality and meritocracy.
- By allowing **junior judicial officers to compete directly with advocates**, the verdict broadens access, strengthens judicial quality, and addresses long-standing structural inequities in career progression within the judiciary.

Rebuilding Trust in Public Service Recruitment

Source: Indian Express

UPSC Relevance: GS 2- Polity and Governance:

Context: Public Service Reforms

Why in News?

Restoring trust in public service recruitment requires transparent appointments, technology-led safeguards, legal accountability, and independent oversight to uphold meritocracy and social justice.

Introduction

- Trust forms the moral and operational foundation of democratic governance. It is the invisible social contract that binds citizens and institutions.
- In India, where millions of aspirants see public service as the pinnacle of social mobility, the credibility of recruitment examinations is central to sustaining faith in the state.
- However, recurrent scams and systemic

lapses across several states have eroded this trust, breeding cynicism, protest, and despair among youth. Rebuilding this trust is not only an administrative necessity but a moral and constitutional imperative.

Significance of Public Service Recruitment Exams

- Public service commissions—both at the Union and state levels—serve as the gatekeepers of meritocracy and social justice.
- They ensure that entry into the bureaucracy and other government services is based on fairness, competence, and equal opportunity.
- For millions of young Indians, especially from modest socio-economic backgrounds, these exams represent the **promise of dignity, stability, and upward mobility**. Thus, any breach in their credibility directly undermines social cohesion and economic aspiration.

The Crisis of Credibility: A Pattern of Scams

- The past decade has witnessed a disturbing proliferation of recruitment-related malpractices across states.
 - **Bihar (2023):** Proxy candidates and leaked papers in the police recruitment exam.
 - **Punjab (2021):** The Punjab Public Service Commission (PPSC) scandal exposed systemic corruption and compromised paper security.
 - **Uttar Pradesh and West Bengal:** Allegations of manipulation and favoritism undermined merit-based selection.
 - **Uttarakhand:** Recent Staff Selection Commission exam leaks triggered widespread protests, prompting a

CBI inquiry.

- These incidents collectively reflect a **structural malaise** rather than isolated administrative failures. They point to **deep-rooted issues of political interference, weak institutional autonomy, and poor technological safeguards**.

Impact: Disillusionment and Social Discontent

- The fallout of such scandals extends far beyond exam halls.
- **Psychological distress:** Years of preparation and financial sacrifices are rendered futile, leading to frustration and alienation.
- **Erosion of faith:** Citizens begin to question the legitimacy of state institutions, weakening the democratic fabric.
- **Youth unrest:** Protests and agitations over paper leaks have increasingly turned violent, signifying deep-seated resentment against a perceived culture of injustice.
- In essence, the recurring failures in recruitment threaten not just individual futures but the **credibility of governance itself**.



(Image Source: Indian Express)

Need for Reform: From Reaction to Reconstruction

- Restoring integrity in recruitment

requires a **holistic, multi-layered reform strategy** combining administrative transparency, technological modernization, and institutional accountability.

- **Transparent Appointments and Functioning:**
 - Appointments to public service commissions must be based on professional competence rather than political patronage.
 - Transparency in recruitment should extend to every stage—syllabus publication, evaluation methodology, and post-exam disclosures—to eliminate ambiguity and mistrust.
- **Leveraging Technology for Integrity**
 - Technological interventions can drastically minimize human discretion and leakages.
 - **Biometric verification and unique candidate IDs** can prevent impersonation and proxy candidates.
 - **Encrypted digital paper transmission systems** can protect question papers from leaks.
 - **AI-driven analytics** can detect anomalies in results and ensure data integrity.
 - Such innovations can make examination processes **tamper-proof and audit-friendly**.
- **Strengthening the Legal and Institutional Framework**
 - Legal deterrence is crucial for accountability. Fast-track courts for exam-related offences and stringent anti-cheating laws—like the one passed in Uttarakhand (2022)—can ensure swift justice.
 - At the institutional level, a **national regulatory authority** could oversee, audit, and evaluate recruitment

processes across states. The Union Public Service Commission (UPSC) or a newly created independent body could be entrusted with this mandate.

- **Accountability and Citizen Participation**
 - Public service commissions must be subjected to **institutional audits** and **citizen oversight**.
 - Independent review panels comprising retired civil servants, legal experts, and representatives from civil society can monitor integrity and decision-making.
 - Such participatory oversight bridges the trust gap between citizens and the state.

Reimagining the Ethos of Recruitment

- Recruitment reform is not merely a technical exercise—it is a **reconstruction of moral legitimacy**.
- An examination system that is fair, transparent, and inclusive reaffirms the democratic ideals of equality and justice. It transforms governance from a privilege-based structure to a merit-based one. In doing so, it strengthens social mobility and the moral fabric of the republic.

Conclusion:

- Rebuilding trust in public service recruitment is integral to rebuilding trust in governance itself.
- A robust, technology-driven, and transparent system is no longer a choice—it is a **fundamental right of every aspirant who dreams of serving the nation**.
- While the path to reform is complex, it is achievable through political will, administrative innovation, and citizen

vigilance.

- In a society where public employment remains a cornerstone of aspiration, restoring trust is the **true measure of a state's commitment to justice, merit, and equality.**

130th Constitution Amendment Bill, 2025

Source: The Hindu

UPSC Relevance: GS 2- Polity and Governance:

Context: 130th Constitution Amendment Bill, 2025

Why in News?

The 130th Constitution Amendment Bill, 2025, mandates resignation of the Prime Minister, Chief Ministers, or Ministers if detained for 30 consecutive days on serious charges.



(Image Source: The Hindu)

Introduction

- 130th Constitution Amendment Bill, 2025, seeks to mandate that the **Prime Minister, Chief Ministers, or Ministers vacate office if arrested and detained for 30 consecutive days** on charges punishable with imprisonment for **at least five years.**
- While the aim is to enhance accountability and integrity in public office, the Bill raises **significant constitutional, political, and legal**

concerns, particularly regarding the **presumption of innocence, separation of powers, and parliamentary conventions.**

Background

- **Parliamentary Conventions:** In India's Westminster-style system, resignation of Ministers is a **political act**, guided by moral judgment and political accountability, not by legal compulsion.
- **Existing Provisions:**
 - **Article 75(1):** The President appoints the Prime Minister; Ministers are appointed on the PM's advice.
 - **Article 164(1):** Governors appoint Chief Ministers; other Ministers on CM's advice.
 - **Article 75(3) & 164(2):** Ministers are accountable to the legislature.
- **Supreme Court Rulings:**
 - **Manoj Narula v Union of India (2014):** PM's advice is binding unless the person is constitutionally disqualified.
 - **Rai Sahib Ram Jawaya Kapur v State of Punjab (1955):** Reinforces parliamentary accountability.
- **Observation:** The Constitution relies on **political judgment, parliamentary scrutiny, and public oversight**, rather than codifying every ethical expectation as law.

Objectives of the Bill

- **Enhancing integrity:** Supporters argue that Ministers facing serious criminal allegations should not hold office.
- **Public trust:** Detention of high-ranking officials erodes citizens' faith in governance.
- **Curbing impunity:** Codifying disqualification aims to deter political leaders from continuing in office while under arrest.

Major Concerns

Presumption of Innocence

- Detention is not equivalent to conviction.
- Mandatory removal after 30 days of detention treats accusation as guilt, undermining a fundamental principle of criminal law.

Political vs. Legal Judgment

- In parliamentary democracy, resignation is political, not legal.
- The Bill converts a question of legislative confidence into constitutional disqualification, interfering with the Westminster model.

Separation of Powers

- Investigative agencies and the executive may dictate ministerial tenure, bypassing judicial oversight.
- Risk of political vendetta if detention is prolonged.

Collective Responsibility

- In parliamentary systems, if the leader resigns, the entire Council of Ministers must also resign.
- The Bill could destabilize governments without floor tests, undermining legislative supremacy (as highlighted in *S.R. Bommai v Union of India, 1994*).

Potential for Misuse

- Detention could be politically motivated.
- Ambedkar warned against codifying moral expectations into constitutional mandates, emphasizing discretion and institutional wisdom.

Alternatives and Recommendations

- **Judicial findings as triggers:** Removal should follow judicial framing of serious charges, not mere detention.
- **Protect investigative agencies from political influence.**
- **Safeguards against misuse:** Clearly

define detention limits, political neutrality, and procedural safeguards.

- **Strengthen parliamentary scrutiny and public accountability,** rather than imposing automatic constitutional disqualification.

Conclusion:

- The 130th Constitution Amendment Bill has **laudable intent**—restoring integrity in public office—but risks **eroding fundamental principles** of parliamentary democracy, including:
 - Presumption of innocence
 - Separation of powers
 - Collective responsibility
 - Political accountability

Way forward:

- Reform should **balance accountability with restraint**, respecting both **constitutional design** and **Westminster conventions**, allowing political judgment to guide ministerial tenure while ensuring mechanisms exist to prevent abuse.

Road to Gender Equity in Courts

Source: The Hindu

UPSC Relevance: GS 2 Polity and Governance

Context: Gender Equity in Courts

Why in News?

The under-representation of women in India's higher judiciary highlights the need for reforms to ensure gender equity and transparency in judicial appointments.

Introduction

- Women's under-representation in India's higher judiciary continues to

remain a matter of concern. Despite decades of progress in women's education and public employment, the upper echelons of the judicial system — particularly the High Courts and the Supreme Court — continue to be dominated by men.

- The *India Justice Report 2025* highlights that women constitute only **14% of judges in High Courts** and a mere **3.1% in the Supreme Court**. Out of 34 judges in the apex court, **only one is a woman**, and among **25 High Courts**, **only one woman serves as a Chief Justice**.
- While her likely elevation as the first woman Chief Justice of India is historic, the overall picture remains grim. If no further appointments of women are made before her tenure ends, the Supreme Court risks having **no female representation at all** — a troubling reflection of systemic exclusion.

Causes of Gender Imbalance: The Collegium Constraint

- The **Collegium system** of judicial appointments — where a small group of senior judges recommend names for elevation — is the principal cause of this imbalance.
- This system, while intended to preserve judicial independence, has created an **"elitist network"** that largely favors individuals with established professional connections or family backgrounds in the legal fraternity.
- Women, along with candidates from marginalized or non-metropolitan backgrounds, find it particularly difficult to penetrate this close-knit circle. The process lacks **transparency, diversity, and equal access**, resulting in a judiciary that does not fully reflect the social fabric of the nation.

A Brighter Picture in the Lower Judiciary

- Interestingly, the **lower judiciary** — subordinate and district courts — presents a **more gender-inclusive** picture. Judges at this level are recruited through **open competitive examinations**, ensuring **merit-based and gender-neutral entry**. Consequently, **women comprise nearly 38%** of the total strength of the lower judiciary.
- This demonstrates that when recruitment is **competitive, transparent, and nationwide**, women perform as well as — and often better than — men. However, infrastructural barriers persist.
- A report by the **Centre for Research and Planning of the Supreme Court (2023)** revealed that **20% of district court complexes lack separate toilets for women**, pointing to the need for a gender-sensitive work environment to sustain women's participation.



(Image Source: The Hindu)

The Case for an All-India Judicial Service (AIJS)

- To correct the imbalance in the higher judiciary, experts and reformers have long advocated the establishment of an **All-India Judicial Service (AIJS)** — a national-level merit-based examination for judicial appointments.
- This idea received strong backing from **President Droupadi Murmu**, who,

during her **Constitution Day address in 2023**, emphasized the need for a system that is “**merit-based, competitive, and transparent**”.

- She noted that such a process could open doors for **under-represented groups** – including women, Scheduled Castes (SCs), Scheduled Tribes (STs), and Other Backward Classes (OBCs) – ensuring diversity and inclusivity at every level of the judiciary.

Resistance from Within: The Judiciary and the Bar

- Despite its merits, the proposal for an AIJS faces **stiff opposition** from both the judiciary and the Bar Council. The main concern is that an all-India service might lead to **executive interference**, thereby compromising **judicial independence**.
- However, this argument appears weak. There has been **no evidence of executive interference** in the recruitment of the lower judiciary – where selection is already through competitive examinations conducted by State Public Service Commissions.
- Thus, a **national-level competitive system** for higher judicial recruitment could ensure uniform standards, greater transparency, and a **check on nepotism and patronage** – without undermining autonomy.

Learning from the UPSC Model

- The **Union Public Service Commission (UPSC)** offers a strong precedent for what a fair and inclusive recruitment process can achieve. Through its annual Civil Services Examination, the UPSC recruits for the **IAS, IPS, IFS, and other services** on a purely **merit-based and transparent** basis.
- Over the years, this system has produced

a **socially diverse and gender-inclusive bureaucracy**.

- In **2024**, out of **1,009 selected candidates**, **318 were from OBC**, **160 from SC**, **87 from ST**, and **109 from EWS** categories.
- **Women's representation** has seen remarkable progress – **11 of the top 25 ranks** were secured by women, including **Rank 1 and Rank 2**.
- The **Indian Police Service (IPS)** witnessed **54 women recruits in 2024**, constituting **28%** of the total strength.
- Such diversity in the bureaucracy demonstrates that a **competitive national examination** can successfully broaden participation across gender and social groups – a model that could equally benefit the judiciary.

Constitutional Backing: Article 312

- **Article 312 of the Indian Constitution** empowers **Parliament** to create new **All-India Services**, including an **All-India Judicial Service**, for maintaining uniform standards of recruitment, training, and service across the country.
- Under this provision, Parliament can legislate to establish the AIJS, with subsequent **control and supervision** vested in the **Supreme Court** to safeguard judicial independence.
- The **UPSC** can be entrusted with the responsibility of conducting the examination, following eligibility and selection criteria framed by the **Supreme Court in consultation with High Courts**.

Implementation Framework: Towards a Transparent and Inclusive Judiciary

- Once constituted, the AIJS can follow a **tiered structure** of recruitment and training:
- **Examination and Selection** – Conducted by the UPSC on a pan-India

basis.

- **Training** – A comprehensive programme under the supervision of the **National Judicial Academy** and respective **High Courts**.
- **Posting and Promotion** – Judges to serve under the **control of the Supreme Court or respective High Courts**, ensuring autonomy and uniformity in career progression.
- Such a system would introduce **meritocracy, transparency, and regional balance** into the judicial hierarchy – helping bridge the glaring gender gap in the higher judiciary.

Conclusion:

- To quote former French Prime Minister **Georges Clemenceau**, *“War is too important a matter to be left to generals.”*
- Similarly, **justice is too serious a matter to be left entirely to the judiciary.**

India's Refugee Policy: The Need for a Non-Discriminatory Framework

Source: The Hindu

UPSC Relevance: GS2 Polity and Governance

Context: India's Refugee Policy

Why in News?

India lacks a comprehensive refugee law, leading to inconsistent and religion-based treatment of refugee groups despite hosting over 2 lakh persons of concern.

Introduction

- India has long been a destination for people seeking refuge from political persecution, ethnic violence, and natural disasters in neighbouring countries.

- Yet, the absence of a formal refugee law has left the distinction between *refugees* and *infiltrators* blurred.
- While the Union Home Minister's emphasis on differentiating between the two categories is valid, the lack of objective parameters and a clear policy framework has led to arbitrary and inconsistent treatment of different refugee communities.

India's Refugee Framework: Absence of a Dedicated Law

- India is **not a signatory to the 1951 UN Convention on the Status of Refugees** or its **1967 Protocol**, which define and protect refugees globally.
- Consequently, **India lacks a comprehensive national refugee law**, leading to reliance on general legislations meant for foreign nationals. Until March 2025, the following Acts were applied to regulate the entry and stay of foreigners, including refugees:
 - Foreigners Act, 1946
 - Registration of Foreigners Act, 1939
 - Passport (Entry into India) Act, 1920
- From **April 2025**, these laws were **replaced by the Immigration and Foreigners Act**, which also subsumed the **Immigration (Carriers' Liability) Act, 2000**. While this consolidated the legal framework for foreign nationals, it did not create specific provisions for *refugees* – persons fleeing persecution – distinct from *illegal migrants*.

Refugee vs Infiltrator: The Problem of Classification

- The term *refugee* implies a person seeking safety from persecution or conflict, whereas *infiltrator* suggests unauthorized entry for illegal purposes. However, in India, **any undocumented**

or overstaying foreign national, regardless of humanitarian reasons, is deemed an *illegal migrant* under the **Citizenship Act, 1955** and may even be labeled an *infiltrator*.

- This lack of distinction often results in **genuine refugees facing harassment or detention**, as the legal framework does not recognize the nuances of displacement, persecution, or statelessness.

Inconsistent Treatment of Refugee Groups

- India's approach toward different refugee communities has been **inconsistent and selective**, often influenced by political, religious, and diplomatic considerations.

Tibetan Refugees

- A *rehabilitation policy* was introduced in **2014** for around **63,000 Tibetan refugees**, providing access to livelihood and education.

Sri Lankan Tamil Refugees

- Nearly **90,000** Sri Lankan Tamil refugees reside in India, but **no official rehabilitation policy** exists for them.
- In **September 2025**, the government granted exemptions from penal provisions under the *Immigration and Foreigners Act* to undocumented or overstaying Tamil refugees who arrived before **January 9, 2015**. While this offers temporary relief, it does not provide a long-term solution or citizenship pathway.
- **Rohingya, Afghan, and Other Refugees:** Refugees from Myanmar, Afghanistan, Bangladesh, Africa, and West Asia—totaling over **2.11 lakh persons of concern as of June 2023**—remain under **ad hoc administrative arrangements**, without clear legal

protection.



(Image Source: Financial Times)

The Citizenship (Amendment) Act, 2019: Religion-Based Exclusion

- The **Citizenship (Amendment) Act, 2019 (CAA)** sought to fast-track citizenship for six religious minorities — **Hindus, Sikhs, Buddhists, Jains, Parsis, and Christians** — from **Pakistan, Afghanistan, and Bangladesh** who entered India before **December 31, 2014**.
- While the intent was humanitarian, it **excluded Muslim minorities** such as **Ahmadis and Hazaras**, and **ignored other persecuted groups** like **Sri Lankan Tamils** and the **Rohingya**. This religion-based differentiation drew criticism for being **discriminatory** and inconsistent with India's secular and humanitarian principles.

Recent Government Measures

- In a positive move, the government recently granted exemptions to **undocumented Tamil refugees** who had registered with authorities before 2015, recognizing their long-standing presence in India.
- Similar relief measures were extended to certain other refugee groups. However, the **policy continues to rely on discretionary executive decisions** rather than a codified, transparent framework applicable to all refugees on equal terms.

Need for a Comprehensive and Non-Discriminatory Refugee Policy

- A robust refugee policy must rest on **consistency, fairness, and humanity**. India, as a regional power and a country with a rich tradition of asylum, requires:
- A **clear legal definition of 'refugee'**, distinct from 'illegal migrant'.
- **Institutional mechanisms** to assess and verify refugee claims based on humanitarian grounds.
- **Uniform rights and protections** for all refugees, irrespective of religion, ethnicity, or country of origin.
- **Cooperation with the UNHCR (United Nations High Commissioner for Refugees)** to ensure compliance with global norms.
- **Long-term rehabilitation and integration policies**, ensuring access to basic services, livelihood, and education.

Conclusion:

- As India continues to host diverse displaced populations – from Tibet, Sri Lanka, Myanmar, and beyond – it is imperative to adopt a **non-discriminatory, transparent, and humanitarian refugee policy** that upholds both national security and India's civilizational ethos of compassion and asylum.

20 Years of the Right to Information Act

Source: Down To Earth

UPSC Relevance: GS2 Polity and Governance

Context: Right to Information (RTI) Act

Why in News?

October 12, 2025, marked 20 years since the

Right to Information (RTI) Act, 2005 came into full effect – a landmark law promoting transparency and accountability.

Introduction

- The **Right to Information (RTI) Act** came into full effect across India, marking a watershed moment in the country's democratic journey.
- The law aimed to promote **transparency, accountability, and citizen empowerment**, enabling people to seek information from public authorities and thereby hold them accountable.
- Two decades later, the RTI stands as both a symbol of democratic empowerment and a reminder of the continuing struggle between citizens' right to know and the state's instinct to control information.
- As India marks **20 years of RTI**, reflections by **Wajahat Habibullah**, the country's **first Chief Information Commissioner (2005–2010)**, provide deep insights into the evolution, challenges, and future trajectory of the Act.

Genesis and Objectives of the RTI Act

- The RTI Act was the outcome of a long and persistent **grassroots movement** led by civil society groups such as the **Mazdoor Kisan Shakti Sangathan (MKSS)** in Rajasthan, which demanded transparency in government functioning, especially in the disbursement of wages and public works.
- Its enactment in 2005 was a recognition that **information is power**, and access to it is fundamental to participatory democracy. The Act sought to:
 - Ensure **transparency and accountability** in government functioning.

- Empower citizens to **scrutinize decisions and actions** of public authorities.
- Promote **public participation** in governance and curb corruption.

Achievements and Successes

- According to Wajahat Habibullah, the RTI has indeed been **successful in democratizing access to information** across diverse social strata.
- **Inclusivity:** The law has empowered not only educated citizens but also **women, slum dwellers, forest communities, and marginalized groups**. Through RTI, many have accessed vital welfare benefits such as **widow pensions, ration entitlements, and school admissions**.
- **Administrative Transparency:** Every government department now maintains a **public website** with policy details, contact information, and public schemes, fulfilling the proactive disclosure provisions under Section 4 of the Act.
- **Public Awareness:** RTI has become a **widely known citizen instrument**, symbolizing participatory governance.
- Thus, the RTI has made transparency a part of administrative discourse and public expectation — a major achievement for any law.

Decline in Efficacy and Emerging Challenges

- Despite its early success, the **efficacy of the RTI regime has declined** over time. Habibullah points out several factors responsible for this downturn:

1. Institutional Weakness and Vacancies

- A large number of posts in the **Central Information Commission (CIC)** and **State Information Commissions (SICs)** remain **vacant**. The **Supreme Court**, in

its **January 7, 2025 order**, sharply criticized this failure, noting that “what is the use of this institution if you do not have persons to perform duties under the law?”

- Vacancies have led to:
 - **Huge pendency** of appeals and complaints.
 - **Delay in justice delivery**, undermining citizens’ faith in the RTI mechanism.
 - **Erosion of autonomy**, as governments retain control over appointments.
- Habibullah argues that this stems from a **policy of weakening autonomous institutions**, particularly those that ensure accountability.

2. The DPDP Act and Privacy Amendments

- The **Digital Personal Data Protection (DPDP) Act, 2023**, has amended the RTI Act by introducing new privacy restrictions.
- Earlier, the RTI Act (Section 8(1)(j)) already contained provisions to protect **personal privacy**, allowing denial of information if it had no relation to public interest.
- The new amendment, however, **overrides the RTI and makes privacy an absolute right**, curtailing the scope of disclosure.
- As Habibullah and other former commissioners like **Shailesh Gandhi** argue, this has effectively “**killed the RTI**”, since privacy is now often cited as a reason to deny information — even in matters of clear public interest.

3. Bureaucratic Resistance and Misuse of Discretion

- Many authorities now **refuse or mislead** applicants seeking information. RTI applications are sometimes viewed as “**acts of indiscipline**” when filed by

government employees.

- This bureaucratic resistance has weakened the culture of transparency, turning the law from a tool of empowerment into a **procedural formality**.

4. Weak Enforcement and Lack of Support Mechanisms

The RTI Act is an **information law**, not an **anti-corruption or grievance redressal mechanism**. Its success depends on complementary institutions such as:

- A **strong Whistleblower Protection Act**, and
- **Effective grievance redressal systems**.
- Their absence has meant that even when RTI exposes corruption, there is **no institutional follow-up or protection** for whistleblowers.

Decline of Social Audits and Grassroots Oversight

- One of the most powerful provisions of the RTI Act is the **right to inspect works and take samples** – crucial for social auditing of government schemes. However, Habibullah notes that such **grassroots accountability mechanisms** have **declined in recent years**, with fewer cases reported in the media.
- While social audits continue under programs like **MGNREGA**, the overall **culture of community inspection and verification** under RTI has diminished due to administrative pushback and lack of awareness.

Reasons for Weakening of the RTI Framework

The weakening of the RTI can be attributed to a **combination of institutional, political, and bureaucratic factors**:

- **Delayed and inadequate appointments**

to commissions.

- **Legislative amendments** (like DPDP Act) that curb disclosure.
- **Administrative apathy** and reluctance to part with information.
- **Absence of complementary mechanisms** for protection and redressal.
- **Political discomfort** with transparency in governance.
- Together, these have led to what many activists call a **“systemic throttling”** of the RTI.

The Way Forward:

- Habibullah emphasizes that the RTI must not be seen as a **weapon against the State**, but as an **instrument for better governance**. To rejuvenate the RTI regime, the following steps are crucial:
 - **Timely appointment** of Information Commissioners and adequate staffing.
 - **Strengthening autonomy** of information commissions and ensuring enforcement powers.
 - **Revisiting the DPDP amendment** to restore balance between privacy and transparency.
 - **Integration with e-governance** – ensuring all public data is proactively disclosed under Section 4.
 - **Public awareness and civic education** to encourage responsible use of RTI.
 - **Protection for whistleblowers** and linkages with anti-corruption frameworks.
 - A **renewed citizens’ movement** – similar to the one that birthed the RTI – may be necessary to restore its original purpose.

Right to Information (RTI) Act, 2005

The **Right to Information Act, 2005**, which came into full effect on **October 12, 2005**, empowers citizens to demand information from public authorities, thereby promoting **transparency, accountability, and participatory governance** in India.

Background and Objectives

- Rooted in the **grassroots movement for transparency** led by the Mazdoor Kisan Shakti Sangathan (MKSS) in Rajasthan.
- Enacted by Parliament to operationalize the **fundamental right to information** implicit in **Article 19(1)(a)** of the Constitution (freedom of speech and expression).
- Aims to:
 - Promote transparency and accountability in public authorities.
 - Empower citizens to fight corruption.
 - Ensure informed participation in democracy.

Key Provisions

- **Section 3:** Every citizen has the right to information.
- **Section 4:** Public authorities must proactively disclose information (suo motu disclosure).
- **Sections 6 & 7:** Procedure for seeking information and time limits for response (30 days generally).
- **Section 8:** Exemptions from disclosure (e.g., national security, privacy, trade secrets).
- **Sections 12-17:** Establish **Central and State Information Commissions** as appellate bodies.
- **Section 20:** Penalty for refusal or delay

in providing information.

Institutional Framework

1. **Public Information Officers (PIOs):** Appointed in every public authority to receive and process RTI applications.
2. **First Appellate Authority (FAA):** Senior officer within the same department for first appeal.
3. **Central Information Commission (CIC) and State Information Commissions (SICs):**
 - Hear second appeals and complaints.
 - Headed by the Chief Information Commissioner.
 - Decisions are binding on public authorities.

Conclusion:

- The **Right to Information Act, 2005**, remains one of independent India's most empowering pieces of legislation – a cornerstone of **democratic accountability**.

Kerala Hijab Controversy – Institutional Discipline vs. Religious Freedom

Source: The Hindu

UPSC Relevance: GS 2 Polity and Governance

Context: Kerala Hijab Controversy

Why in News?

Kerala's St. Rita's Public School faced a controversy in October 2025 when a student was denied permission to attend classes wearing a hijab.

Introduction

- The Kerala hijab row unfolded at **St. Rita's Public School**, a church-run

institution affiliated with the **Central Board of Secondary Education (CBSE)** in **Palluruthy, Kochi, Ernakulam** district.

- The controversy began when a **Class 8 student** appeared on campus wearing a **hijab (headscarf)**, which the school management alleged violated the prescribed **uniform policy**.
- The issue quickly escalated along **religious and political lines**, drawing attention from the **Kerala High Court**, **state government officials**, **political parties**, and **media**, highlighting the sensitive interplay between **religious freedom**, **education rights**, and **institutional autonomy**.

Legal and Administrative Perspectives

School Management's Stand:

- The **uniform policy** had been in place for **nearly three decades** without previous violations.
- The school cited a **2018 Kerala High Court ruling**, which upheld that **private educational institutions have the right to frame rules for uniforms and manage administration autonomously**, including **decisions on dress code**.
- The management maintained that **the student was never barred from attending classes**.

Parents' and Education Department's View:

- The **parents claimed** that the school violated the student's **fundamental right to freedom of religion**.
- The **district education authorities** alleged that the school **denied the student her right to education**, as she was reportedly made to stand outside the classroom.



(Image Source: The Hindu)

Constitutional Mandate Relevant to the Kerala Hijab Row

1. Fundamental Rights (Part III of the Constitution):

○ Article 25 – Freedom of Religion:

- Guarantees **freedom of conscience** and the **right to freely profess, practice, and propagate religion**, subject to **public order, morality, and health**.
- The student's right to wear a hijab could be argued under "**practice of religion**", but it is **not absolute** and must be balanced against **institutional rules** and **public order**.

○ Article 14 – Right to Equality:

- Ensures **equality before law** and **equal protection of laws**.
- Any rule applied by the school, such as a **uniform policy**, must be **non-discriminatory** and **applied equally to all students**, irrespective of religion, caste, or gender.

○ Article 19(1)(g) – Right to Practice Profession/Occupation:

- Recognized in the **educational context** as the **right to access educational institutions**.
- Denial of entry to a student based on religious attire could be interpreted as **interference with this right**, though private institutions also have

autonomy in administration.

○ **Article 21 - Right to Life and Personal Liberty:**

- Right to **education** (read with Article 21A) is considered part of **life and personal liberty**.
- Schools must not **deny education** arbitrarily, and the student must have access to **learning without discrimination**.

2. **Autonomy of Educational Institutions:**

- Recognized by **courts** (e.g., Kerala High Court, 2018 ruling):
 - Private educational institutions have the **fundamental right to manage and administer** their institution.
 - Includes **framing rules on uniforms, discipline, and administration**.
 - Autonomy must be **balanced with constitutional rights** of students, especially freedom of religion and right to education.

3. **Balancing Test:**

- The issue represents a **classic case of balancing competing constitutional rights**:
 - **Individual religious freedom** (Article 25) vs. **institutional autonomy** (Article 19(1)(g) + **administrative rights**).
 - Courts often apply a **proportionality test**: whether the restriction is reasonable, non-discriminatory, and serves a legitimate aim (such as uniformity and discipline).

Key Takeaways

- **Balance Between Rights and Rules:** The case underscores the **delicate balance between individual rights and institutional autonomy** in Indian schools.
- **Role of Mediation:** Intervention by elected representatives and constructive dialogue **helped de-escalate tensions**,

demonstrating the importance of **negotiation and consensus** in sensitive socio-religious issues.

- **Legal Precedent:** Upholds **private institutions' autonomy** in framing uniform policies, subject to legal compliance and fundamental rights.
- **Sociopolitical Implications:** Highlights how **religion, politics, and education intersect**, often influencing public perception and policy debates.

Conclusion:

- The **Kerala hijab controversy** was a manifestation of **clashes between individual religious expression and institutional regulations**.

Uttarakhand's Proposed Amendments to the Uniform Civil Code (UCC)

Source: Indian Express

UPSC Relevance: **GS 2 Polity and Governance**

Context: **UCC**

Why in News?

Uttarakhand proposes amendments to its Uniform Civil Code Rules, 2025, to strengthen privacy, relax registrar powers, and simplify live-in relationship registration amid legal challenges.

Introduction

- The Uttarakhand government has proposed a set of amendments to the **Uniform Civil Code (UCC) Rules, 2025**, in response to **petitions challenging** certain provisions of the **UCC Act, 2024**, and its implementing rules.
- These petitions—filed before the **Uttarakhand High Court**—highlighted

concerns about **privacy violations, overreach of authority, and potential social consequences**, particularly regarding **live-in relationship registration**.

Background

- **Uniform Civil Code (UCC)** seeks to provide a **common set of civil laws** governing marriage, divorce, inheritance, and related matters for all citizens, irrespective of religion.
- **Uttarakhand** became the **first Indian state** to enact and operationalize a UCC in **2024**, fulfilling a long-standing constitutional directive under **Article 44** (Directive Principles of State Policy).
- However, the implementation faced criticism, especially concerning **privacy, autonomy, and bureaucratic overreach**, leading to judicial scrutiny.

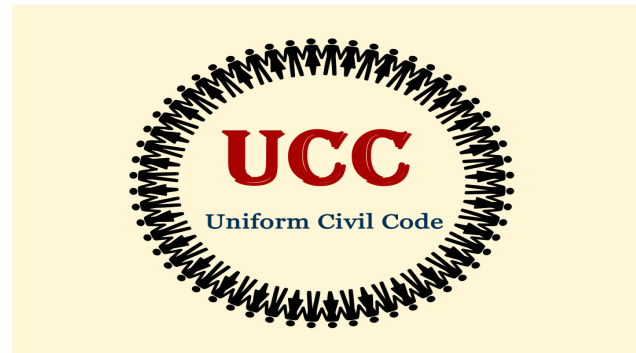
Why the Amendments Were Proposed

- **Legal Challenges:** Multiple petitions in the Uttarakhand High Court argued that certain provisions violated:
- The **right to privacy** (as upheld in the *K.S. Puttaswamy v. Union of India* judgment, 2017).
- **Individual autonomy and dignity**, particularly of women in live-in relationships.
- **Public and Expert Concerns:**
- Senior Advocate **Vrinda Grover** and others pointed out that rules allowed **police surveillance** over private relationships.
- Mandatory **Aadhaar authentication** and **police intimation** for live-in registrations were seen as intrusive.
- **Judicial Advice:** The High Court advised the state to consider legitimate concerns and **invite public suggestions** for necessary amendments.

Key Amendments Proposed

Privacy Safeguards

- **Aadhaar-based authentication removed:**
 - Earlier, registration of marriages and live-in relationships required **Aadhaar verification** and OTP from the Aadhaar-linked mobile number.
 - The amendment now allows **alternative IDs**, such as passport, voter ID, etc.
 - Linking of mobile numbers with Aadhaar is now **non-obligatory**.
- **Information handling:**
 - Earlier, registration details were kept at the **local police station**.
 - The new draft states that it is the **responsibility of the Registrar and police authorities** to ensure **confidentiality** of all data.



(Image Source: Politics for India)

Disclosure of Children in Live-in Relationships

- **Provision deleted:**
 - Original rules required disclosure of **pregnancy or birth of children** during or after termination of live-in relationships.
 - This is now **removed** to protect privacy and prevent **social stigma**.
- **Legal basis retained elsewhere:**
 - Legitimacy of children remains protected under **Section 16(1) of the Hindu Marriage Act**, ensuring no

discrimination against children born from void marriages.

Relaxation of Registrar's Authority

- **Powers curtailed:**
- The Registrar can no longer **inform parents or guardians** of registrants below 21 years.
- Authority to conduct **summary enquiries** into the veracity of applications has been revoked.
- **Religious verification:** Earlier, Registrars could verify with religious leaders about "prohibited relationships." This power is now **withdrawn**.
- **Provisional certificates:**
- Temporary registration certificates valid for 30 days have been scrapped.
- Applications will now be directly **approved or rejected**.

Supporting Documents Made Optional

Documents such as:

- Proof of shared household (rental or ownership details),
- Proof of previous marriage/divorce,
- Proof of government employment or welfare benefits, are now **optional** rather than mandatory.
- **Caste details** of registrants are **no longer required**.

Punitive Provisions Revised

- Earlier penalties for **false complaints** or **non-registration** have been eased.
- Alignment made with the **Bharatiya Nyaya Sanhita (BNS), 2023:**
- **Non-registration or false declarations:** Up to **3 months imprisonment** or ₹25,000 fine.
- **Live-in with a minor:** Up to **6 months imprisonment** or ₹50,000 fine.
- **Bigamy or live-in while married:**

Punishable up to **7 years imprisonment**.

- **Marriage by force, coercion, or fraud:** Up to **7 years imprisonment** and fine.

Legal and Social Implications

1. Strengthened Privacy Protections

- The amendments align with **constitutional guarantees of privacy** and individual liberty, mitigating earlier criticism of **state surveillance** over personal life choices.

2. Gender and Social Sensitivity

- Removal of child disclosure clauses reduces **stigma and humiliation** for women.
- It recognizes **informal relationships** within a **rights-based framework**, ensuring protection without moral policing.

3. Administrative Simplification

- By reducing bureaucratic powers and making documentation flexible, the government aims to create a **simpler and citizen-friendly registration process**.

4. Continued Legal Oversight

- While privacy is strengthened, legal accountability remains intact for issues like:
 - Bigamy,
 - Live-in relationships with minors,
 - Fraudulent marriages.

Challenges Ahead

- **Implementation and Awareness:** Effective communication and public education about new provisions are essential to avoid confusion.
- **Judicial Review:** The High Court's final ruling on the petitions may still alter the implementation of certain rules.
- **Cultural Sensitivity:** Balancing uniformity in civil law with respect for religious and social diversity remains a

challenge.

- **Replication Across States:** Uttarakhand's UCC experience will serve as a **model or caution** for other states like Gujarat or Assam considering similar laws.

Conclusion:

- The proposed amendments to Uttarakhand's UCC Rules, 2025, represent a **significant course correction** – shifting from a surveillance-heavy framework to a **rights-based, privacy-conscious approach**.

EPFO withdrawals and Draining Employees' Retirement Corpus

Source: Indian Express

UPSC Relevance: GS 2 Polity and Governance, Social Security

Context: EPFO Withdrawal Issue

Why in News?

Frequent premature withdrawals from EPFO accounts are eroding retirement savings, with nearly half of members having less than ₹20,000 at final settlement.

Introduction

- The Employees' Provident Fund Organisation (EPFO), India's largest social security body, was designed to ensure financial security for formal sector employees' post-retirement. However, recent data and trends show that frequent and premature withdrawals are significantly depleting members' retirement corpus.
- The EPFO's recent proposals to reform withdrawal norms – including introducing a **25% minimum balance requirement** – stem from growing

concern that members are exhausting their savings long before retirement.

The Core Issue: Erosion of the Retirement Corpus

- According to EPFO data reviewed by *The Indian Express*, nearly **half of EPFO members have less than ₹20,000** at the time of final settlement, despite years of contributions. Moreover, **75% of members** have less than ₹50,000, and **87% have less than ₹1 lakh** when closing their accounts.
- This pattern shows that what is meant to be a *retirement fund* has effectively become a *short-term financial cushion*, defeating its intended purpose.

Understanding the Employment Profile of EPFO Members

- The structure of EPFO membership further explains this trend:
- **Over 65%** of members contribute at or below the wage ceiling of ₹15,000 per month (mandatory coverage limit).
- The remaining **35% contribute voluntarily** with wages above ₹15,000.
- EPFO currently manages **over 30 crore accounts**, of which **7 crore are active** contributing members, managing a corpus exceeding **₹26 lakh crore**.
- This profile highlights the predominance of lower-income formal workers within the EPFO framework – individuals more likely to face income insecurity during unemployment or emergencies, prompting early withdrawals.

The Premature Withdrawal Pattern

- A striking **95% of total final settlement claims in 2024-25** were made prematurely – that is, before actual retirement.

- Key data points include:
 - Out of **52.95 lakh** final settlements, **24.21 lakh members (46%)** were later found to have **rejoined employment**, suggesting withdrawals were made simply to access funds during short employment breaks.
 - Around **66% of the total withdrawal amount** was attributed to unemployment-related premature settlements under **Para 69(2)** of the EPF Scheme, 1952, which permits full withdrawal after two months of unemployment.
- This shows how frequent exits and re-entries have become systemic, eroding members' long-term benefits.



(Image Source: Indian Express)

Consequences of Premature Settlements

- The EPFO has warned that frequent final settlements have severe implications:
- **Loss of pension benefits:** Members who withdraw from the **Employees' Pension Scheme (EPS)** before completing **10 years of pensionable service** lose future pension eligibility.
- **Ineligibility for family pension:** Breaks in service mean that dependents are deprived of family pension in case of the member's death.
- **Diminished corpus:** Members end up with meagre retirement savings, undermining financial security in old age.

- The trend of declaring temporary unemployment to withdraw funds, followed by rejoining the same or similar employment, is particularly damaging in the long run.

Rising Partial Withdrawals: Post-Covid Surge

- Apart from final settlements, **partial withdrawals** have also surged across categories, especially after the Covid-19 pandemic:

(a) Illness Claims

- **2024-25:** 3.25 crore claims worth ₹52,633.92 crore
- **2023-24:** 2.10 crore claims worth ₹33,696.54 crore
- This marks a **55% year-on-year rise**, reflecting growing use of EPF funds for health emergencies.
- Between **2017-2025**, around **58% of members availed illness advances more than once**, and **25% did so four times**.

(b) Housing Withdrawals

- **2024-25:** 15.52 lakh claims worth ₹23,712.46 crore
- **2017-18:** 4.91 lakh claims worth ₹8,437.33 crore
- Indicates steady increase as housing remains a key aspiration for middle-income earners.

(c) Special Circumstances

- **2024-25:** 6.99 lakh claims worth ₹1,016.73 crore (highest in 7 years)
- **2023-24:** 3.99 lakh claims worth ₹588.77 crore
- These trends show the EPF's growing role as a short-term relief instrument rather than a long-term pension asset.

EPFO's Recent Reforms

- To address these distortions, EPFO has **streamlined withdrawal categories**

from 13 to **three major groups**:

- **Essential needs** (illness, education, marriage)
- **Housing needs**
- **Special circumstances**
- **Key changes include:**
- Introduction of a **minimum balance requirement of 25%** in members' accounts.
- Increased withdrawal flexibility:
 - Up to **10 times for education** during membership.
 - Up to **5 times for marriage**.
- Withdrawals under illness or special circumstances allowed **3 and 2 times per financial year**, respectively.
- Raised **waiting period for premature final settlement** after unemployment from **2 months to 12 months** (although up to 75% can still be withdrawn earlier).

Public Response and Clarifications

- These reforms sparked criticism, particularly from lower-income workers and political leaders who argued that the restrictions curb access to their own savings during crises.
- Following the backlash, the **Ministry of Labour and Employment** clarified:
- Members can withdraw **75% of their balance immediately** after job loss.
- The **remaining 25%** can be withdrawn after **12 months of unemployment**. This ensures liquidity for workers while retaining a base for long-term retirement security.

The Policy Dilemma: Immediate Need vs. Long-term Security

- EPFO's dilemma highlights the tension between:
 - **Short-term financial needs** of workers, especially during job loss or illness, and

- **Long-term pension adequacy** for an ageing workforce.
- Frequent withdrawals, though understandable in a low-income context, compromise future financial stability. A senior EPFO official summarized this concern:
- "Every provident fund member should be a pensioner if they work for 30 years. But multiple withdrawals reduce corpus and pension. We must prepare for an ageing population that will depend on its own savings."

Broader Implications for India's Social Security System

- The data underlines a larger structural challenge:
 - India lacks robust **social protection mechanisms** like universal health coverage or unemployment insurance.
 - Consequently, the **EPF serves as a default social safety net**, even though it was not designed for that purpose.
- The erosion of EPF balances thus reflects both **income insecurity** and **weak social safety architecture** in the formal sector.

Conclusion:

- The EPFO's findings reveal a worrying reality: India's formal sector workers are depleting their retirement savings prematurely, often due to economic vulnerabilities rather than imprudence.
- However, for these measures to be effective, they must be supported by **broader labour reforms, income stability, and expanded social security nets** beyond the EPF framework. Only then can India's retirement system truly serve its intended purpose – ensuring dignity and security in old age.

Centre Defends Forest Rights Act in SC Upholding Tribal Rights

Source: Indian Express

UPSC Relevance: GS 2 Polity and Governance

Context: FRA 2006

Why in News?

The Ministry of Tribal Affairs defends the Forest Rights Act (FRA), 2006 and the 2012 Rules in the Supreme Court, emphasizing protection of tribal rights, livelihoods, and cultural identity.

Introduction

- The Ministry of Tribal Affairs (MoTA) has filed a counter affidavit in the Supreme Court (SC) defending the **Forest Rights Act (FRA), 2006**, against a petition challenging the legal validity of the **2012 Rules** framed under the Act. The challenge alleges a potential conflict between the FRA and existing **wildlife protection laws**.

About the Forest Rights Act (FRA), 2006

- Objective:** The FRA was enacted to recognize and vest the **forest rights and occupation in forest land** to forest-dwelling Scheduled Tribes (STs) and other traditional forest dwellers.
- Focus:**
 - Restoration of **dignity and livelihoods** of forest communities.
 - Protection of **cultural identity** and traditional knowledge.
 - Legal recognition of **community and individual rights** over forest resources.

Key Features:

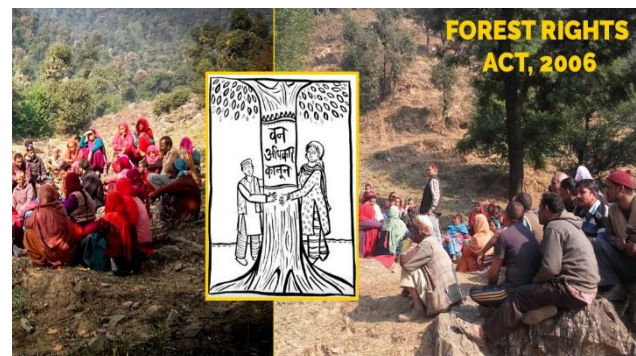
- Recognition of rights:** Individual rights (cultivation, habitation) and community rights (grazing, collection of forest

produce, minor forest produce, fishing, water bodies).

- No sunset clause:** MoTA highlights that the **absence of a time limit** is intentional to ensure equity and prevent arbitrary denial of rights due to deadlines.
- Empowerment of local communities:** Through **Gram Sabhas** and local authorities to approve claims.

2012 Rules under FRA

- These rules were framed to operationalize the provisions of the FRA.
- They detail **procedures for recognition, verification, and vesting of rights**, ensuring transparency and participation of forest-dependent communities.



(Image Source: Himachal Watcher)

Centre's Defence in Supreme Court

- Legal Validity:**
- MoTA contends that the 2012 Rules are fully **constitutional and legally valid**, aligning with the spirit of the FRA.
- Beyond Land Ownership:**
- The FRA is not just about **land rights**; it **restores socio-cultural and economic dignity** of forest dwellers.
- It recognizes the **interconnectedness of forests and livelihoods** of tribal communities.
- Equity and Inclusion:**
- The **absence of a sunset clause** is deliberate. It prevents **arbitrary deadlines** that could disenfranchise

communities from claiming their rights.

- **Balance with Wildlife Protection:**
- The law provides a framework to **harmonize forest rights with environmental conservation**, ensuring coexistence of human and ecological needs.

Significance of the Defence

- **For Tribals:** Reinforces the FRA as a tool for **social justice** and **restoration of traditional rights**.
- **For Policy:** Emphasizes the Indian approach of **inclusive conservation**, where tribal rights are not sacrificed for environmental objectives.
- **For Legal Precedent:** SC's ruling will clarify the **scope of FRA vis-à-vis wildlife protection laws**, impacting forest governance nationwide.

Challenges and Controversies

- **Conflict with Wildlife Laws:** Critics argue that granting land rights inside protected areas may **hamper biodiversity conservation**.
- **Implementation Gap:** Recognition of rights has been **slow in some states**, limiting the Act's intended impact.
- **Awareness and Participation:** Forest dwellers often **lack information** about filing claims or accessing benefits.

Conclusion:

- The Supreme Court case highlights the **delicate balance between conservation and tribal rights**. By defending the FRA and its rules, the Centre emphasizes **equity, cultural dignity, and livelihood security** of forest-dependent communities. The outcome will have a **far-reaching impact on forest governance, environmental policy, and tribal welfare in India**.

Pan-India Special Intensive Revision (SIR) of Voters' List

Source: The Hindu

UPSC Relevance: GS 2 Polity and Governance

Context: Special Intensive Revision (SIR)

Why in News?

The Election Commission of India (ECI) is set to announce a pan-India Special Intensive Revision (SIR) of the voters' list on October 27, 2025, covering 10-15 states, including those going to Assembly polls in 2026.

Introduction

- Recently, the **Election Commission of India (ECI)** is set to announce the **pan-India Special Intensive Revision (SIR)** of the electoral rolls.
- This marks a major nationwide initiative to ensure the **accuracy, inclusiveness, and transparency** of the voters' list ahead of the 2026 Assembly elections in several states.

What is the Special Intensive Revision (SIR)?

- The **Special Intensive Revision** is an **enhanced version** of the regular annual updating process of the electoral rolls.
- It involves **comprehensive field verification, door-to-door verification drives, and digital reconciliation of elector data** to ensure that:
 - Every eligible citizen (18 years and above) is enrolled.
 - No name is duplicated or deleted erroneously.
 - Voter details are updated accurately with correct address and demographic information.

Objective of the Pan-India SIR

The pan-India SIR aims to:

- **Ensure purity and inclusivity** of electoral rolls across all States and Union Territories.
- **Update records** before major elections in 2026.
- **Remove discrepancies** such as duplication, migration, or incorrect deletions.
- **Map electors with previous SIR data** to assess progress in voter registration and accuracy.
- **Integrate technology** such as the Voter Helpline App, NVSP (National Voter Service Portal), and ERONet (Electoral Roll Management System).

First Phase Coverage

- While the detailed schedule is awaited, officials indicate that the **first phase** will cover **10 to 15 states**, including those heading to Assembly polls in 2026 – namely:
 - Tamil Nadu
 - West Bengal
 - Kerala
 - Assam
 - Puducherry



(Image Source: The Hindu)

Recent Developments

- The ECI recently held a **two-day conference of Chief Electoral Officers**

(CEOs) on **October 22-23, 2025**, in New Delhi to review preparedness for the SIR.

- CEOs were instructed to **map the current electors** with those from the **last SIR** and identify gaps in registration, deletions, and migrations.
- **Tamil Nadu's SIR** is set to begin within a week, following ECI's submission to the **Madras High Court**.

Significance of the Exercise

- **Strengthening Electoral Democracy-** A clean and accurate voters' list is fundamental to **free and fair elections**, preventing impersonation and bogus voting.
- **Promoting Electoral Inclusion-** The SIR ensures inclusion of **new voters**, particularly **first-time electors** turning 18, and **marginalized or migratory groups**.
- **Digital Modernization-** By integrating digital platforms (ERONet, NVSP, and Aadhaar seeding where permitted), the ECI aims to enhance **transparency and efficiency**.
- **Preparation for Upcoming Elections (2026-2029)-** The 2025-26 SIR serves as a preparatory step toward the **2026 Assembly polls** and the **2029 General Elections**.

Challenges and Concerns

- **Accuracy vs. Accessibility:** Ensuring no genuine voter is left out while removing ineligible entries.
- **Data Privacy:** Linking voter data with Aadhaar and other databases must comply with privacy norms.
- **Logistical Complexity:** Coordinating field verification across States and UTs is resource-intensive.
- **Migration and Urban Mobility:** Tracking voters who frequently change

residence remains difficult.

Legal and Institutional Framework

- Conducted under the provisions of the **Representation of the People Act, 1950**, and **Registration of Electors Rules, 1960**.
- Overseen by the **Election Commission of India (Article 324, Constitution of India)**, which supervises the preparation and revision of electoral rolls.
- Chief Electoral Officers (CEOs)** and **District Election Officers (DEOs)** execute the revision at the State and District levels, respectively.

Way Forward

- Periodic and Transparent Updates:** Ensure regular digital publication of draft rolls for public scrutiny.
- Voter Awareness Campaigns:** Conduct voter education drives under **SVEEP (Systematic Voters' Education and Electoral Participation)** program.
- Technology-driven Verification:** Use GIS mapping and AI tools to detect duplication and anomalies.
- Enhanced Grievance Redressal:** Strengthen mechanisms for voters to raise objections or request corrections swiftly.

Conclusion:

- The **pan-India Special Intensive Revision (SIR) of voters' list** reflects the ECI's commitment to **strengthen India's electoral integrity** through inclusivity, accuracy, and technological modernization.

As India prepares for a new electoral cycle, a credible and up-to-date voter list remains the **bedrock of democratic legitimacy** and citizen participation.

U.K. Shows Interest in India's e-Courts Project

Source: The Hindu

UPSC Relevance: GS2 Polity and Governance

Context: e-courts

Why in News?

The United Kingdom has shown interest in India's e-Courts Project Phase III, which aims to digitize over 3,108 crore court documents.

Background:

- A **UK delegation** is scheduled to visit **New Delhi on November 6, 2025**, to hold discussions with senior officials from the **Union Law Ministry** and members of the **Supreme Court's e-Committee**.

The e-Courts Project

- The **e-Courts Project** is an ambitious mission mode project under the **National e-Governance Plan (NeGP)**. It was conceptualised under the "National Policy and Action Plan for Implementation of Information and Communication Technology (ICT) in the Indian Judiciary, 2005", prepared by the **e-Committee of the Supreme Court of India**.
- The project is being implemented by the **Department of Justice**, Ministry of Law and Justice, in close coordination with the **e-Committee** and the **NIC (National Informatics Centre)**.

Objectives of the e-Courts Project

- To enhance **efficiency, transparency, and accessibility** in the justice delivery system.
- To enable **ICT-enabled judicial**

processes across all courts in India.

- To provide **citizen-centric services**, such as case tracking, e-filing, and virtual hearings.
- To promote **environmentally sustainable practices** by reducing paper-based work.
- To **integrate stakeholders** in the criminal justice system—courts, police, jails, and forensic labs—through a unified digital framework.



Image Source: The Hindu)

Phases of the e-Courts Project

- **Phase I (2010–2015):**
 - Focused on **computerization of district and subordinate courts**.
 - Over **14,000 courts** were computerized.
 - Case information system (CIS) software introduced.
 - Public portals for case status and cause lists were launched.
- **Phase II (2015–2023):**
 - Focus on **enhanced connectivity and integration** between courts and stakeholders.
 - Introduction of **e-filing, e-payment, and National Judicial Data Grid (NJDG)**.
 - Development of **virtual courts** for traffic challans and petty offences.
 - Enabled video-conferencing facilities and **digital case flow management**.
- **Phase III (2023–2027):**

- Cleared by the **Union Cabinet in September 2023**.
- Focus on **complete digital transformation** and **cloud migration**.
- Budget outlay: **₹7,210 crore** (approximate total for all components).

Key Features of Phase III

- **Massive Digitisation of Court Records:**
- A total of **3,108 crore documents** will be digitised.
- This will create a **national-level digital repository** of legal documents.
- **Cloud Migration:**
- The system will migrate to **cloud technology** for scalability, security, and accessibility.
- Estimated cost for **25 petabytes of cloud storage**: ₹1,205.20 crore.
- **Virtual Courts Expansion:**
 - Establishment of **1,150 virtual courts** across India.
 - Estimated cost: ₹413.08 crore.
 - Aim: To allow remote hearings, reduce case pendency, and cut down litigation costs.
- **Integration with Inter-Operable Criminal Justice System (ICJS):**
 - Seamless data exchange between **courts, police, jails, and forensic laboratories**.
 - Improves case coordination, reduces duplication, and enhances investigation speed.

Green Judiciary:

- Reduced dependence on paper, minimizing environmental impact.
- Encourages **paperless filing** and **digital communication** between courts and litigants.

Citizen-Centric Digital Services:

- Online payment of **court fees, fines, and penalties** from any location.
- Access to judgments, orders, and case updates in real-time.

UK's Interest and Global Collaboration

- The United Kingdom's interest signals growing international recognition of India's digital justice transformation.
- The visiting delegation will explore areas of technical cooperation, judicial digitization, and knowledge sharing with India's Department of Justice and Supreme Court's e-Committee.

Potential areas of collaboration:

- Best practices in **digital case management systems**.
- **Cybersecurity** in digital judicial infrastructure.
- **AI-assisted legal analytics** and document management.
- Use of **cloud and blockchain technologies** for secure judicial records.

Significance of the e-Courts Project

Aspect	Impact
Efficiency	Reduces case pendency, improves coordination, and speeds up hearings.
Accessibility	Litigants, lawyers, and citizens can access court services online.
Transparency	Real-time case status tracking ensures accountability.
Inclusivity	Promotes justice delivery even in remote areas through virtual courts.
Environmental Sustainability	Reduces paper usage and physical document transfers.

Challenges

- Ensuring **cybersecurity and data privacy** of sensitive court records.
- Need for **digital literacy** among judges, lawyers, and court staff.
- **Infrastructure gaps** in rural and remote courts.
- **Change management** and resistance to new systems.

Way Forward

- Strengthen **cyber resilience** through encryption and secure cloud practices.
- Expand **training programmes** under the National Judicial Academy.
- Improve **last-mile internet connectivity** in rural courts.
- Promote **AI-based case prioritization** and analytics for efficient management.
- Foster **international partnerships**, like the UK collaboration, for innovation and capacity building.

Conclusion:

- The **e-Courts Project Phase III** represents a major step towards building a **digitally empowered judiciary** in India. It aligns with the government's **Digital India Mission** and **Ease of Doing Justice** initiative.
- The UK's interest reflects India's growing global leadership in judicial technology transformation. Successful implementation will not only **enhance access to justice** but also **set a benchmark for digital governance worldwide**.

SC Upholds Calcutta High Court Order Directing Centre to Resume MGNREGS in West Bengal

Source: Down To Earth

UPSC Relevance: GS 2 Polity and Governance

Context: MGNREGS

Why in News?

The Supreme Court upheld the Calcutta High Court's directive ordering the Centre to resume MGNREGS in West Bengal.

Introduction

- In a landmark judgment reinforcing the constitutional right to work, the Supreme Court of India on October 27, 2025, upheld the Calcutta High Court's June 2025 directive ordering the Union Government to resume works under the **Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)** in West Bengal.
- The verdict marks a crucial victory for nearly **25 million rural workers** who had been deprived of employment opportunities and wages for almost three years.

Background of the Case

- The Calcutta High Court, on **June 18, 2025**, had directed the Centre to restore MGNREGS operations in the state from **August 1, 2025**, emphasizing that "*the scheme of the Act does not envisage a situation where it would be put to cold storage for eternity.*"
- Despite this clear order, neither the central nor the state government initiated steps for its implementation. Instead, the Centre moved the Supreme Court, seeking repeated adjournments that further delayed justice and extended the hardship faced by workers.
- The suspension of payments and work under MGNREGS in West Bengal dated back to **December 21, 2021**, when the Union government stopped releasing funds, citing alleged irregularities.

- By **March 2022**, the issuance of work permits had also been halted, effectively bringing the employment guarantee scheme to a standstill. The decision impacted millions of rural households, many of whom depend on MGNREGS wages for subsistence.

The Petition and Court Proceedings

- The case was filed by the **Paschim Banga Khet Majoor Samity (PBKMS)**, a trade union representing rural laborers. Advocate **Purbayan Chakraborty**, who appeared on behalf of PBKMS, stated that the prolonged suspension of the scheme deprived workers of their *rightful entitlements* under the MGNREG Act.
- The apex court's decision came after dismissing the **Union government's appeal**, affirming the High Court's stance that indefinite suspension of a statutory welfare scheme was contrary to both the spirit and the purpose of the Act.

Reactions and Implications

- Anuradha Talwar**, convenor of the **NREGA Sangharsh Morcha (NSM)**, drew attention to the evolving challenges faced by MGNREGS workers in recent years, describing a "three-pronged attack" on the scheme:
 - Technological barriers** that have made access to work and wage payments more difficult.
 - Entrenched corruption** within the state machinery, where funds are allegedly misused for electoral and personal gains.
 - Insufficient budgetary support** from the Centre, leading to delayed payments and limited employment generation.

Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)

- The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) is a **rights-based rural employment programme** launched in 2006 under the **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), 2005**.
- It aims to enhance **livelihood security** in rural areas by providing **at least 100 days of guaranteed wage employment** in a financial year to every rural household whose adult members volunteer to do unskilled manual work.
- **Key Features:**
 - **Legal entitlement:** It is a demand-driven, rights-based scheme, not a welfare programme.
 - **Coverage:** Applicable to all districts of India except those with 100% urban population.
 - **Funding pattern:** Shared between the **Centre and States** —
 - Wages: 100% funded by the Centre.
 - Material and administrative costs: 75% Centre, 25% State.
 - **Implementation:** Executed mainly by **Gram Panchayats**.
 - **Wage payment:** Through **Direct Benefit Transfer (DBT)** into workers' bank or post office accounts.
 - **Unemployment allowance:** If work is not provided within 15 days of demand, workers are entitled to an unemployment allowance.
 - **Transparency mechanisms:**
 - **Social audit** by Gram Sabha.
 - **Management Information System (MIS)** for real-time monitoring.



(Image Source: Down To Earth)

Significance of the Verdict

- The Supreme Court's affirmation of the High Court's directive is being seen as a **reassertion of the constitutional right to livelihood** and an important step in safeguarding **social security legislation**.
- The judgment underlines that welfare schemes like MGNREGS cannot be arbitrarily suspended, as they form an integral part of India's rural safety net.
- By restoring MGNREGS in West Bengal, the Court has not only revived employment opportunities but also reinforced the principles of **federal accountability, transparency, and citizen entitlement** under the law.

Conclusion:

- The dismissal of the Centre's plea marks a decisive moment for rural workers in West Bengal and across India.
- As MGNREGS activities resume, the focus now shifts to effective implementation, timely wage disbursement, and restoration of trust among rural households.
- The judgment stands as a reminder that **the right to work, as enshrined under the MGNREG Act, is not a privilege — but a legal and moral guarantee owed to every rural citizen.**

SC Examines Election

Commission's Powers Amid Expansion of Special Intensive Revision (SIR)

Source: The Hindu

UPSC Relevance: GS2 Polity and Governance

Context: ECI and Article 324

Why in News?

The Supreme Court is examining whether the Election Commission's Special Intensive Revision (SIR) of electoral rolls, aimed at verifying voters and citizenship, exceeds its constitutional powers under Article 324.

Introduction

- The Election Commission of India (ECI) has initiated a pan-India **Special Intensive Revision (SIR)** of electoral rolls, aimed at cleaning, updating, and verifying voter lists across several states.
- However, the legality and constitutional propriety of this exercise have been challenged before the **Supreme Court**, with petitioners alleging that the ECI has overstepped its statutory and constitutional boundaries – particularly by linking the process to citizenship verification.
- This development has opened a critical debate on the **scope of ECI's plenary powers under Article 324**, the **limits of its jurisdiction**, and the **protection of the right to vote** in a democratic polity.

Background: The SIR Exercise

What is SIR?

- The **Special Intensive Revision** is an enhanced electoral roll verification process undertaken by the ECI to update and purify the voters' list.
- It involves door-to-door verification by

Booth Level Officers (BLOs), collection of proof of residence, and in some cases, documents to establish **citizenship**.

First Phase – Bihar Pilot

- The first phase was launched in **Bihar** in June 2024 under **Section 21(3) of the Representation of the People Act, 1950 (RPA, 1950)**. It faced criticism and legal challenge on the grounds that it:
 - Violated the RPA and the Registration of Electors Rules, 1960.
 - Forced existing voters to re-prove their citizenship.
 - Imposed an arbitrary procedure not backed by statutory law.

Second Phase – Pan-India Rollout

- Despite the legal challenge, the ECI has expanded SIR to **12 States and Union Territories**, covering approximately **51 crore voters**.
- Modifications have been introduced – such as the inclusion of **Aadhaar as proof of identity** and **exemption from document filing at the enumeration stage** – but the fundamental controversy over **citizenship verification** persists.



(Image Source: DD News)

Constitutional and Legal Issues Before the Supreme Court

- The Supreme Court, in its **July 10, 2025 order**, framed the fundamental question:

- “Does the Election Commission of India have the power to conduct such an exercise as SIR, and is it being done in a constitutionally valid manner?”
- This question touches upon:
 - The **extent of ECI's powers** under Article 324.
 - The **right to vote as a constitutional and statutory right**.
 - The **procedural safeguards for inclusion and deletion in electoral rolls**.

Arguments of the Petitioners

1. Violation of Voters' Rights

- Petitioners (represented by advocates Prashant Bhushan, Vrinda Grover, and Neha Rathi) argue that:
- **SIR violates the fundamental right to vote** guaranteed under Article 326.
- It **forces citizens to repeatedly prove their citizenship**, violating dignity and equality under Articles 14 and 21.
- The process **lacks statutory backing**, as neither the **RPA, 1950** nor the **Rules, 1960** authorize citizenship verification by the ECI.

2. Citizenship Beyond EC's Jurisdiction

- They contend that the **Citizenship Act, 1955** and the **Foreigners Act, 1946** already define and regulate citizenship matters.
- Hence, the **ECI has no jurisdiction** to determine or verify citizenship, especially for voters already enrolled.

3. Precedent – Lal Babu Hussain Case (1995)

- In *Lal Babu Hussain vs. Electoral Registration Officer*, the Supreme Court held:
- “The burden of proof of citizenship lies only on those seeking fresh registration, not on existing registered voters.”
- Thus, requiring existing voters to re-

establish citizenship is **contrary to settled law**.

Election Commission of India (ECI)

- The **Election Commission of India (ECI)** is a **constitutional body** established under **Article 324** of the Indian Constitution.
- It is responsible for **superintendence, direction, and control** of elections to:
 - Parliament (Lok Sabha and Rajya Sabha),
 - State Legislatures (Vidhan Sabha and Vidhan Parishad), and
 - The offices of the **President and Vice-President** of India.

Composition

- As per **Article 324(2)**:
 - The ECI consists of the **Chief Election Commissioner (CEC)** and such number of **Election Commissioners (ECs)** as the President may decide.
- Currently, it is a **three-member body** – **one CEC and two ECs**.
- They are **appointed by the President of India**.

New Reform (2023): A selection committee (following the Supreme Court's March 2023 ruling) includes:

- Prime Minister (Chairperson)
- Leader of Opposition in Lok Sabha
- A Union Cabinet Minister nominated by the PM

This ensures greater transparency in appointments.

Tenure and Conditions

- Tenure: **6 years or until 65 years of age**, whichever is earlier.
- They enjoy the **same status and privileges as Supreme Court judges**.
- The **Chief Election Commissioner** can be removed **only through**

impeachment (same as SC judges), ensuring independence.

Powers and Functions

(a) Constitutional Powers (Article 324)

- **Superintendence, direction, and control** of the entire electoral process.
- Preparation and revision of **electoral rolls**.
- Conduct of **elections to Parliament, State Legislatures, President, and Vice-President**.
- Determination of **eligibility and disqualification** of candidates (in certain cases).

(b) Statutory Powers

Granted under:

- **Representation of the People Act, 1950** – Preparation and revision of electoral rolls.
- **Representation of the People Act, 1951** – Conduct of elections, dispute settlement, and model code of conduct enforcement.

(c) Administrative and Advisory Functions

- Issues **Model Code of Conduct** during elections.
- Advises the President and Governors on **disqualification of legislators** (Articles 103 and 192).
- Recognizes political parties and allots **election symbols**.
- Monitors **election expenditure**, enforces campaign norms, and ensures free and fair elections.

Legislatures.”

- Citing the landmark **Mohinder Singh Gill v. Chief Election Commissioner (1978)** case, the EC argues:
- Article 324 gives **residual and plenary powers** to act in areas **not covered by statute**.
- It allows the ECI to take “**prompt action to ensure free and fair elections**” even when legislation is silent.

2. Citizenship as a Precondition to Vote

- Under **Article 326** and **Section 16 of the RPA, 1950**, only **citizens of India** can be registered as voters. Thus, according to the EC:
- Verifying citizenship is **integral** to maintaining the purity of the electoral roll.
- The **burden to prove citizenship** rests on the **individual claiming inclusion** in the voter list.

Judicial Responses and Interim Observations

- The Supreme Court **did not stay** the Bihar SIR but ordered **greater transparency**:
- Publication of **draft electoral rolls**.
- Inclusion of **Aadhaar as an additional document**.
- Monitoring to **prevent arbitrary exclusions**.

Key Legal Provisions Involved

Provision	Content / Relevance
Article 324	Empowers the ECI with “superintendence, direction, and control” over elections.
Article 326	Provides for universal adult suffrage; only Indian citizens can vote.
Section 21(3),	Allows revision of

Arguments of the Election Commission

1. Plenary Powers Under Article 324

- The ECI claims **constitutional authority** to conduct SIR under **Article 324(1)**, which grants it:
- “Superintendence, direction, and control of elections to Parliament and the State

RPA 1950	electoral rolls under conditions prescribed by law.
Registration of Electors Rules, 1960	Prescribes detailed procedures for inclusion, deletion, and verification of voters.
Lal Babu Hussain (1995)	Burden of proof of citizenship lies on new registrants, not existing voters.
Mohinder Singh Gill (1978)	Article 324 powers are plenary but must be exercised within constitutional limits.

The Constitutional and Democratic Dimensions

1. Balance Between Autonomy and Accountability

- The ECI's autonomy is crucial for **free and fair elections**, but unchecked use of **plenary powers** risks **judicial and democratic overreach**.
- If SIR is deemed to have citizenship-screening elements, it may **infringe individual rights** and **undermine electoral inclusion**.

2. Right to Vote – Not a Fundamental Right, But a Democratic Necessity

- While technically a **statutory right**, the **right to vote** has constitutional sanctity under **Article 326**.
- Any action that **arbitrarily deprives citizens** of this right could amount to a **violation of constitutional morality**.

3. Citizenship Verification – A Slippery Slope

- Requiring lineage or ancestry details (as in the Bihar SIR) risks turning voter verification into a **citizenship determination exercise**, reminiscent of the **Assam NRC** process – a politically and socially sensitive precedent.

4. Institutional Implications

- If the Court upholds EC's claim, it could **broaden the scope of Article 324** and **strengthen institutional independence**.
- Conversely, if restricted, it may **reassert the supremacy of legislative frameworks** over constitutional bodies in electoral matters.

Conclusion:

- The Supreme Court's upcoming verdict on the **SIR's constitutionality** will have far-reaching implications for India's **electoral integrity, citizenship policy, and democratic rights**.
- It will test the delicate equilibrium between ECI's **autonomy** and **constitutional accountability**, reaffirming whether **plenary power** can extend to functions **not explicitly authorized by law**.

Freebies vs. Welfare: Need for Honest Welfare and Electoral Accountability in India

Source: Indian Express

UPSC Relevance: GS2 Polity and Governance

Context: Freebies culture in India

Why in News?

Former Chief Election Commissioner argues that India needs honest welfare, not reckless freebies, to protect democracy and fiscal stability.

Background

- The 2025 Bihar Assembly election has reignited the national debate over the ethics and economics of pre-election freebies.
- India's democracy risks becoming an

“auction” where votes are purchased through public money rather than earned through policies.

- There is a need for a clear distinction between **legitimate welfare** and **fiscally reckless populism**, urging institutional reform to preserve both democracy and fiscal discipline.

Freebies

- It refers to **goods, services, or monetary benefits provided by the government (or promised by political parties)** to citizens **without any direct cost or corresponding obligation** from the beneficiaries, often **announced close to elections** to influence voter behaviour.
- They are **not part of constitutionally mandated welfare responsibilities** but are rather **politically motivated giveaways** that can strain public finances.
- **Key Characteristics of Freebies**
 1. **Non-essential in nature:** Not linked to basic rights like food, health, or education.
 2. **Short-term and populist:** Announced primarily for electoral gains.
 3. **Fiscal burden:** Funded by public money, often without sustainable revenue sources.
 4. **No capacity-building:** Do not enhance long-term human development or productivity.
 5. **Erode accountability:** Used as political instruments rather than developmental tools.

increasingly resemble **auctions of public resources**. In Bihar’s 2025 Assembly campaign alone, political promises amount to over ₹8 lakh crore annually – **three times the state’s total budget**.

- **Nitish Kumar** pledged free power, social pensions, and 1 crore jobs.
- **Prime Minister Modi** transferred ₹10,000 to 75 lakh women under a ₹7,500 crore pre-poll scheme.
- **Tejashwi Yadav** promised cash transfers, electricity subsidies, and government jobs for every family – a fiscal impossibility.
- This competition for populism exemplifies what Quraishi calls **the weaponisation of welfare** – the conversion of welfare measures into **vote-buying tools**.

Welfare vs. Freebies: Understanding the Difference

Welfare	Freebies
Constitutional obligation to ensure food, education, health, and social security.	Short-term political handouts, often timed before elections.
Builds human capabilities (e.g., mid-day meals, MGNREGA, public health).	Creates dependency and fiscal stress.
Targets poverty reduction and long-term empowerment.	Aims at electoral gain and populist appeal.

- **Example:**
 - *Mid-Day Meal Scheme* improves nutrition and attendance → **welfare**.
 - *Pre-poll cash handouts* without accountability → **freebies**.

From Democracy to Auction Politics

- Elections are meant to celebrate democracy, but in India, they

The Hypocrisy of Political Vocabulary

- Tax breaks or subsidies for corporations are termed “incentives” or “reforms”.

- Small cash transfers for the poor are branded as “fiscal irresponsibility.”
- For instance, the **2019 corporate tax cut** from 30% to 22% cost ₹1.45 lakh crore annually, yet it was hailed as bold economic reform. But similar spending on social transfers for the poor attracts criticism.
- This reveals a **moral inconsistency** in economic policymaking — welfare for the rich is “reform,” but for the poor, it is “populism.”



(Image Source: Indian Express)

Legal and Ethical Loopholes in Electioneering

India's legal framework offers **partial control** over electoral freebies:

- **Before the Model Code of Conduct (MCC):** Ruling parties often rush to launch schemes before the MCC is enforced — **legally permissible but ethically questionable.**
- **After MCC enforcement:** Manifesto promises are **exempt** from restrictions. In **S. Subramaniam Balaji vs. State of Tamil Nadu (2013)**, the **Supreme Court** held that such promises do not constitute “corrupt practices” under **Section 123 of the Representation of the People Act (RPA)**, even though they “shake the roots of free and fair elections.”
- This paradox means:
- Offering a voter a cup of tea counts as bribery, but promising ₹2,500 per month to millions is legal.

Fiscal Consequences: The Price of Populism

- The **Reserve Bank of India's (RBI) Report on State Finances (2022-23)** cautioned that **fiscally overstretched states risk collapse.**
- **Punjab:** 300 units of free electricity; debt-to-GSDP ratio = **47.2%** (2023-24).
- **Rajasthan:** ₹56,000 crore spent on pre-poll schemes; state debt = **₹5.6 lakh crore.**
- **Bihar:** Populist promises exceed **₹8 lakh crore** — unsustainable for one of India's poorest states.
- **Who pays the price?** Not the politicians or their parties, but **taxpayers — present and future.**
- Freebies today are **taxation and economic distress tomorrow.**

When Welfare Works: Positive Case Studies

Not all subsidies are economically unsound. History shows that **targeted welfare** can transform lives:

- **N.T. Rama Rao's ₹2/kg rice scheme** (Andhra Pradesh, 1980s) curbed starvation deaths.
- **Bicycle Scheme for girls (Bihar)** boosted school enrolment by **30%.**
- **MGNREGA** created employment security and rural income stability.
- The key lies in **intent and outcome** — welfare should empower citizens, not entice voters.

Socioeconomic Inequality: The Context of the Debate

- Despite decades of welfarism:
 - The **richest 1%** own **51.5%** of India's wealth.
 - The **bottom 60%** own just **5%** (Oxfam India, 2022).
 - India ranks **130th** on the **UN Human**

Development Index (2023).

- One-third of Indian children are malnourished.
- 81 crore people depend on free food grains.
- Hence, India's welfare challenge is **not excessive spending**, but **ineffective and politically distorted spending**.

Judicial Developments: The Call for Reform

- In November 2023, the Supreme Court admitted a plea seeking to classify **pre-poll freebies as corrupt practices** under the RPA.
- Justice B.V. Nagarathna observed that *"distribution of private goods to influence voters must be treated as a corrupt practice."*
- The Court also suggested setting up a **constitutional body** to define and regulate freebies – though the case remains pending.

Policy Recommendations

- **Mandatory Costed Manifestos:** Parties must publish **fiscally verified cost estimates** and face penalties for false declarations.
- **Treat Cash Promises as Bribery:** Direct pre-poll transfers to voter groups should be banned under **RPA Section 123**.
- **Pre-Election Scheme Ban:** No new welfare schemes should be introduced within **six months before elections**.
- **Fiscal Transparency:** Political parties must disclose how proposed schemes will be funded – via loans, new taxes, or reallocation.
- **Link Welfare to Empowerment:** Schemes promoting **education, employment, and skill-building** should be incentivised over **consumption-based subsidies**.

Conclusion: Towards Honest Welfare and Clean Elections

- India stands at a moral and economic crossroads. Elections cannot be **auctions**, and democracy cannot thrive on **vote-for-cash populism**.
 - "India does not need less welfare – it needs honest welfare. It does not need fewer elections – it needs cleaner elections."
- The ultimate choice lies between **vote banks and the nation**. Without reform, a democracy that runs on freebies risks running out of both **money and meaning**.

Supreme Court to Determine Criteria for Seniority in Higher Judicial Services

Source: Indian Express

UPSC Relevance: GS2 Polity and Governance

Context: Supreme court Judge seniority

Why in News?

- A five-judge Constitution Bench of the Supreme Court began hearings on October 28, 2025, to decide criteria for determining seniority between *promotee judges* and *direct recruits* in the Higher Judicial Services (HJS).

Background

- India A five-judge Constitution Bench of the Supreme Court, led by Chief Justice B.R. Gavai, began hearings on October 28, 2025, to determine the **criteria for seniority in the cadre of Higher Judicial Services (HJS)**.
- At the core of this issue lies a long-standing imbalance in **promotion**

opportunities and career progression between two categories of district judges:

- **Promotees** – officers who rise through the lower judiciary, and
 - **Direct recruits** – advocates appointed directly from the Bar.
- The Court's decision will have far-reaching implications for **judicial service structure, morale, and the composition of higher courts.**

Dual Entry System in the District Judiciary

- Under the current framework, **District Judges** enter the Higher Judicial Service through two main routes:
 - **Promotion:** from the ranks of Civil Judges (Junior Division) and Civil Judges (Senior Division).
 - **Direct Recruitment:** from practicing advocates at the Bar.
- While promotees constitute **around three-fourths of the total cadre**, direct recruits often **ascend more rapidly** in seniority and promotion lists due to age and roster advantages.

The Core Issue: Disparity in Seniority

- The controversy arises because **seniority** is determined largely by the **date of entry** into the cadre, regulated through a **40-point roster system** introduced after the *All India Judges Association case (2002)*.
- **Promotees** generally reach the District Judge level in their **mid-40s**, after years in subordinate courts.
- **Direct recruits** usually join in their **mid-30s**, giving them more years of service before retirement.
- This difference, compounded by the way the **roster system** is implemented, means **promotees often fall behind** in gradation lists, affecting their eligibility

for **further promotion or elevation to High Courts.**

Evidence from High Court Data

Affidavits submitted by several High Courts revealed a consistent pattern of disparity:

- **Bihar:** Out of 91 Principal District & Sessions Judges, **86 were direct recruits** and only **5 promotees**. The court noted that soon all senior-most judges would be direct recruits.
- **Uttar Pradesh:** Of 70 officers at the District Judge level, **58 were direct recruits, 12 promotees.**
- **Bombay High Court:** Since 2020, **19 District Judges** were elevated to the High Court – **16 direct recruits, 3 promotees.**
- **Kerala High Court:** Of 42 sitting judges, **15 were from the district judiciary – 10 direct recruits, 5 promotees.**
- **Rajasthan:** Of 13 judges elevated from the judicial service, **12 were promotees**, showing variation across states.
- **Andhra Pradesh High Court:** Recommended that **50% of High Court appointments from service officers** be drawn from those who started as Civil Judges to ensure representation.
- These data sets demonstrate how **direct recruits dominate senior ranks**, leaving promotees with limited opportunities for higher posts or elevation.



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- (Image Source: Indian Express)

Consequences of the Structural Imbalance

- **Career Disadvantage:** Promotee judges often reach senior positions **near retirement**, leaving minimal time for consideration for High Court elevation.
- **Loss of Experience:** The system sidelines officers with **decades of trial court experience**, which is vital for the higher judiciary.
- **Demoralisation:** The perception of **unequal promotion prospects** discourages both serving officers and young law graduates from joining at the entry level.
- **Institutional Impact:** The imbalance reduces the diversity of judicial experience at higher levels, potentially affecting judicial quality and representativeness.

Judicial Framework and the 2002 Reforms

- The foundation of the current system lies in the **All India Judges Association case (1992–2002)**, where the Supreme Court sought to **standardise service structures** for the subordinate judiciary.
- Key directives from 2002:
 - **Recruitment Ratio:** 75% by promotion, 25% by direct recruitment.
 - Within the 75%:
 - 50% by **merit-cum-seniority**,
 - 25% through **Limited Departmental Competitive Examination (LDCE)** – a *fast-track* channel for talented Civil Judges.
- **40-point Roster System:** Adopted from *R.K. Sabarwal v. State of Punjab* (1995) to ensure inter-se seniority based on roster slots rather than joining dates.
- However, implementation has been **uneven and inconsistent** across states,

resulting in the very inequities the roster was designed to prevent.

National Legal Services Authority (NALSA)

- The **National Legal Services Authority (NALSA)** is a **statutory body** established under the **Legal Services Authorities Act, 1987**.
- It aims to **provide free and competent legal services** to the weaker sections of society and ensure that **justice is not denied to anyone due to economic or other disabilities**.
- **Constitutional Basis**
 - **Article 39A** of the **Directive Principles of State Policy (DPSPs)** in the Constitution of India directs the State to ensure:
 - Equal justice for all, and
 - Free legal aid to the poor and weaker sections.
 - NALSA is the institutional mechanism created to implement this constitutional mandate
- **Composition**
 - **Patron-in-Chief:** Chief Justice of India (CJI)
 - **Executive Chairman:** Second senior-most Judge of the Supreme Court
 - **Members:** Includes judges, legal experts, and nominated persons as per the Act
 - At the state level:
 - **State Legal Services Authority (SLSA)** – headed by the **Chief Justice of the High Court** of that state as the Patron-in-Chief.
 - **District Legal Services Authority (DLSA)** – headed by the **District Judge**.

The 2025 Supreme Court Revisions

- In May 2025, the Supreme Court

revisited and clarified the earlier framework to address implementation lapses:

- **LDCE Quota Restored:** Reaffirmed as 25% of the promotional intake (many states had reduced it to 10%).
- **Eligibility Relaxed:** Minimum qualifying service reduced from five years to three, facilitating faster progression for meritorious officers.
- **Entry-Level Criteria:** Reinstated the requirement of **minimum three years of legal practice** for Civil Judge applicants to ensure courtroom maturity.
- **Quota Calculation Standardised:** Directed that promotion quotas be based on **total sanctioned strength**, not on current vacancies, to prevent distortions.
- These clarifications aimed to **streamline promotions** and **remove systemic bottlenecks**, but issues of seniority and parity persisted — leading to the current constitutional bench hearing.

Why the Decision Matters

- The issue extends beyond administrative fairness; it concerns the **functional balance and representational equity** of India's judiciary.
- The **district judiciary forms the foundation** of the judicial system, handling nearly 90% of all litigation in India.
- Many **eminent judges of the Supreme Court** — including Justice Bela M. Trivedi — have risen from this service stream.
- Ensuring fair progression from the district level is vital to maintain **institutional continuity, morale, and judicial diversity**.
- A fair and predictable seniority structure ensures that:

- Experience from the trial judiciary informs higher judicial decision-making.
- Judicial officers view their career path as transparent and rewarding.
- The judiciary reflects both **merit and service experience**, not age or entry route.

Conclusion:

- The Supreme Court's forthcoming judgment on the **criteria for determining seniority in Higher Judicial Services** will be a defining moment in judicial administration. It must strike a "**proper balance**" between:
- Rewarding **merit and early entry**, and
- Valuing **experience and long service**.

India's New Tribal Affairs Policy

Source: Indian Express

UPSC Relevance: GS2 Polity and Governance

Context: Tribal Affairs Policy

Why in News

The Union Tribal Affairs Ministry's new policy framework redefines India's conservation approach by emphasizing community rights and sustainable human-tiger coexistence instead of forced relocations.

Background

- The India's evolving conservation strategy is at a critical juncture.
- The new policy framework introduced by the **Union Ministry of Tribal Affairs (MoTA)** marks a significant shift from the traditional *fortress conservation* model—where humans are excluded from protected areas—to one that views conservation as a *social contract*.
- This framework recognizes that forest-

dwelling and tribal communities are **stakeholders, not trespassers**, in the process of preserving India's rich biodiversity, including its iconic tiger population.

From Fortress Conservation to Community-Centred Models

- Historically, India's conservation efforts, particularly in tiger reserves and national parks, followed a *fortress conservation approach* inspired by colonial and Western practices.
- Under this model, **local populations were relocated or excluded** from forest areas to create inviolate spaces for wildlife.
- While this approach helped increase tiger numbers—from around 1,411 in 2006 to over 3,000 in 2023—it often **marginalized indigenous communities**, violated their rights, and created social conflicts.
- The **Forest Rights Act (FRA), 2006** was enacted to correct this imbalance by recognizing the individual and community rights of forest dwellers.
- However, its implementation has remained inconsistent, often subordinated to conservation imperatives led by the **National Tiger Conservation Authority (NTCA)** and the **Ministry of Environment, Forest and Climate Change (MoEFCC)**.

Recent Policy Developments (2023–2025)

The new **MoTA policy** aims to reaffirm a rights-based and participatory conservation model. Its major provisions include:

- Protection Against Premature Relocation:** No community can be relocated from forest areas until the **FRA process** is completed. This ensures due recognition of land and resource rights

before any displacement.

- Relocation as an "Exceptional Measure:** The policy overturns the **2024 NTCA directive** that called for the mass removal of villages from tiger reserves. Relocation will now be treated as a last resort, emphasizing coexistence rather than exclusion.
- Coexistence and Sustainable Models:** It promotes **research and pilot projects** on sustainable human-tiger coexistence, seeking a socially legitimate model of conservation that values both ecological and cultural sustainability.
- Legal Safeguards and Redress Mechanisms:** The policy invokes provisions of the **SC/ST (Prevention of Atrocities) Act** against unlawful evictions. It also establishes a **three-tier grievance redress system**, ensuring accountability and justice for affected communities.
- Community-Centred Conservation Framework:** The proposed **National Framework for Community-Centred Conservation and Relocation** seeks to institutionalize participation and ensure that conservation outcomes are equitable and inclusive.

Balancing Rights and Ecology: The Core Challenge

- While the policy strengthens social justice and legal protections, it also raises complex ecological questions.
- Forest-dependent communities** have diverse aspirations: some seek modern amenities such as education and healthcare, while others prioritize traditional ways of life and cultural autonomy.
- Tigers and other apex predators** require extensive, undisturbed core areas to thrive, which some conservationists

argue is incompatible with human presence.

- Therefore, the challenge lies in designing **fine-grained, locally sensitive mechanisms** that balance both conservation imperatives and community needs—an objective that requires collaboration beyond the capacity of central ministries.

Implementation and Institutional Challenges

- Despite its progressive intent, several **institutional and operational challenges** may affect the policy's success:
- **Resistance from Conservation Establishments:** Traditional conservation agencies may resist the shift, viewing it as a dilution of efforts to consolidate tiger habitats.
- **State-Level Variations:** As **forest management is a state subject**, the degree of FRA enforcement and community participation varies widely. Some states may continue forced relocations despite the new policy.
- **Dual Policy Risks:** The possibility of dual or conflicting policies on the ground—one under MoEFCC emphasizing exclusion, and another under MoTA emphasizing inclusion—may create administrative confusion.
- **Weak Implementation of Compensation Norms:** Even where relocation occurs with consent, **compensation and rehabilitation standards** are often violated, eroding trust and undermining the legitimacy of conservation efforts.

The Way Forward: Towards Inclusive and Resilient Conservation

- A truly effective conservation model for

India must rest on **scientific, social, and ethical foundations**. Key steps forward include:

- **Integrated Governance:** Establish coordination mechanisms between MoTA, MoEFCC, and State Forest Departments to ensure policy coherence.
- **Localised Conservation Planning:** Develop **context-specific conservation strategies** that recognize the ecological sensitivity of regions while respecting the rights and aspirations of local communities.
- **Scientific Zonation:** Maintain *human-free core areas* for tigers based on ecological science, while allowing *buffer and transition zones* for community-based livelihoods and stewardship.
- **Capacity Building and Monitoring:** Strengthen the institutional capacity of local bodies, gram sabhas, and forest rights committees for participatory management and transparent monitoring.
- **Social and Ecological Research:** Promote long-term studies on **human-wildlife coexistence models** to inform adaptive management and policy refinement.

Who are Tribes?

- Tribes, officially known as **Scheduled Tribes (STs)**, are indigenous communities identified by their distinct cultural, social, and economic characteristics, and historical marginalization from mainstream society.
- They are recognized under **Article 366(25)** of the Constitution as communities "specified under Article 342" by the President of India.

Constitutional Provisions for Scheduled Tribes

The framers of the Constitution provided **special safeguards** for the protection, welfare, and development of STs across political, social, and economic dimensions.

1. Identification and Safeguards

- **Article 342** – Empowers the President to specify tribes or tribal communities as *Scheduled Tribes* for each State/UT.
- **Article 366(25)** – Defines Scheduled Tribes.

2. Political Safeguards

- **Article 330 & 332** – Reservation of seats for STs in the Lok Sabha and State Legislative Assemblies.
- **Article 334** – Duration of such reservation (periodically extended through Constitutional Amendments).
- **Article 243D** – Reservation for STs in Panchayats.
- **Article 243T** – Reservation for STs in Municipalities.

3. Administrative and Special Governance Provisions

- **Article 244(1)** – Administration of Scheduled Areas and Tribes in accordance with the **Fifth Schedule** (mainly for Central and Western India).
- **Article 244(2)** – Administration of Tribal Areas in the **Sixth Schedule** (for Northeast India – Assam, Meghalaya, Tripura, Mizoram).

Fifth Schedule:

- Applies to 10 States (e.g., Jharkhand, Odisha, Chhattisgarh, MP, Maharashtra).
- Provides for **Tribal Advisory Councils (TACs)** and **Governor's special responsibility** for tribal welfare.

Sixth Schedule:

- Provides **Autonomous District**

Councils (ADCs) with legislative, judicial, and executive powers in tribal areas of the Northeast.

4. Protective and Developmental Provisions

- **Article 46** – Directive Principle: Promotes educational and economic interests of STs and protects them from exploitation.
- **Article 275(1)** – Grants from the Centre for welfare of STs.
- **Article 338A** – Establishes the **National Commission for Scheduled Tribes (NCST)** to monitor safeguards and welfare measures.

Major Government Initiatives for Tribal Welfare

A. Institutional Mechanisms

1. **Ministry of Tribal Affairs (MoTA)** – Established in 1999 for dedicated policy formulation, implementation, and monitoring.
2. **National Commission for Scheduled Tribes (NCST)** – Established in 2004 (89th Amendment Act) for protecting ST rights.
3. **Integrated Tribal Development Agencies (ITDAs)** – Implement area-based programs in Tribal Sub-Plan areas.

B. Developmental and Welfare Schemes

- **Eklavya Model Residential Schools (EMRS)**: Provide quality education to ST students in remote areas.
- **National Fellowship and Scholarship for Higher Education of ST Students**.
- **Van Dhan Vikas Kendras (VDVKs)**: Promote value addition to Minor Forest Produce (MFP) through TRIFED.
- **Pradhan Mantri Vanbandhu Kalyan Yojana (PMVKY)**: Focused on holistic tribal development.

- **Poshan Abhiyaan & Mission Saksham Anganwadi:** Address malnutrition in tribal regions.
- **Sickle Cell Anemia Elimination Mission (2023-32):** Targeted at tribal populations with high prevalence of the disease.
- **Pradhan Mantri Aadi Adarsh Gram Yojana (PMAAGY):** Upgrades tribal villages with basic infrastructure and livelihood opportunities.
- **Scheduled Tribe Component (STC):** Ensures a fixed percentage of plan funds are earmarked for ST welfare across ministries.

C. Legal and Protective Measures

- **Forest Rights Act (FRA), 2006:** Recognizes individual and community rights over forest land and resources.
- **PESA Act, 1996 (Panchayats Extension to Scheduled Areas):** Empowers Gram Sabhas in Scheduled Areas with control over natural resources and local governance.
- **SC/ST (Prevention of Atrocities) Act, 1989:** Protects STs from discrimination, violence, and social injustice.

Conclusion:

- The new policy framework marks a **progressive shift in India's conservation philosophy**—from exclusion to engagement, from control to collaboration.
- By reaffirming the **Forest Rights Act** and positioning conservation as a *shared social contract*, it recognizes that protecting biodiversity is inseparable from protecting people.

Fiscal Prudence over Pension Populism

Source: New Indian Express

UPSC Relevance: GS2 Polity and Governance

Context: 8th Central Pay Commission

Why in News?

- The Centre's **Terms of Reference (ToR) for the 8th Central Pay Commission (CPC)** emphasize fiscal prudence by including the **"unfunded cost of non-contributory pension schemes,"** signalling no return to the Old Pension Scheme (OPS).

Background

- The Union Government's recent notification of the **Terms of Reference (ToR) for the 8th Central Pay Commission (CPC)** marks a significant policy stance in India's public finance management.
- While the formation of every pay commission since independence has been a routine administrative exercise aimed at revising the pay, allowances, and pensionary benefits of Central Government employees, the **8th CPC**—headed by **Justice Ranjana Prakash Desai**—reflects a notable shift in emphasis.
- Unlike earlier commissions, the latest ToR explicitly instructs the panel to consider the **"unfunded cost of non-contributory pension schemes,"** signalling the Centre's intent to uphold **fiscal prudence** and resist pressure for reverting to the **Old Pension Scheme (OPS)**.

8th Central Pay Commission:



(Image Source: New Indian Express)

Background: From OPS to NPS and UPS

- Until **December 31, 2003**, Central Government employees were covered under the **Old Pension Scheme (OPS)** – a **non-contributory, defined benefit** system where the entire pension liability was borne by the government.
- In **2004**, the **National Pension System (NPS)** was introduced for all new entrants to Central Government service (except armed forces), marking a paradigm shift to a **contributory, defined contribution** framework. Both employee and employer contribute a fixed percentage of salary, and the final pension depends on market returns.
- In recent years, a **Unified Pension Scheme (UPS)**—an upgraded, partially guaranteed version of the NPS—was introduced, seeking to balance **employee welfare with fiscal sustainability**.
- However, sections of employees recruited after 2004 continue to demand restoration of the **OPS**, arguing that it provides financial security through assured lifelong pension and family benefits, unlike the market-dependent NPS.

The 8th CPC and its Terms of Reference

- The **8th CPC** was notified with a **five-point Terms of Reference**, focusing on balancing the need for equitable

compensation with the imperatives of fiscal discipline and national development priorities.

Key Components of the 8th CPC ToR:

- **Economic Conditions and Fiscal Prudence**
- The Commission must assess the prevailing macroeconomic environment and ensure that pay revisions align with fiscal realities and sustainability.
- **Availability of Resources for Development and Welfare**
- The ToR emphasises that adequate public funds should continue to be available for **developmental expenditure**, ensuring that wage and pension bills do not crowd out welfare investments.
- **Unfunded Cost of Non-Contributory Pension Schemes**
- A new addition, this clause directs the panel to consider the **financial burden of the OPS**, which lacks a dedicated corpus and relies entirely on current revenues, posing long-term fiscal risks.
- **Impact on State Finances**
- Since States often follow the Centre's pay recommendations, the ToR instructs the Commission to examine the **likely impact on State Governments**, which already face mounting salary and pension liabilities.
- **Parity with Public and Private Sector Emoluments**
- The Commission must review pay and benefits vis-à-vis **Central Public Sector Undertakings (CPSUs)** and the **private sector**, ensuring competitiveness and rationality.

Comparison with the 7th CPC ToR

- The **7th CPC**, chaired by **Justice Ashok Kumar Mathur**, was tasked with a

broader review of **emoluments, allowances, and benefits** across Central Government services, including industrial and non-industrial employees, All India Services, Union Territories, Indian Audit and Accounts Department, members of statutory regulatory bodies (except RBI), and officers of the Supreme Court.

- However, a major **difference** in the 8th CPC's ToR lies in the explicit mention of "**unfunded cost of non-contributory pension schemes**", absent in the 7th CPC's mandate.
- This inclusion is widely interpreted as the government's **policy signal against reinstating the OPS**, reflecting its commitment to **sustainable fiscal management** amidst growing demands for reverting to the older pension structure.

Fiscal Concerns: The Case Against OPS

- The OPS is **non-contributory and fiscally unsustainable**, as current taxpayers fund the pensions of retired employees without any dedicated investment corpus. According to estimates from the **Reserve Bank of India (RBI)** and **Department of Expenditure**, pension liabilities have become one of the **fastest-growing components** of government expenditure, particularly at the State level.
- States that reverted to OPS—such as Rajasthan, Chhattisgarh, Punjab, and Himachal Pradesh—have seen **pension liabilities double** within a few years, raising concerns about long-term fiscal stress.
- By contrast, the **NPS and UPS** aim to distribute the burden between employee and employer, while ensuring partial

funding through investment-based returns.

Implications for Employees and Pensioners

- Many employees and pensioners covered under the OPS interpret the new ToR as a **signal of reduced government empathy** towards staff welfare. They argue that by foregrounding fiscal prudence, the government is **prioritising macroeconomic stability over social security of employees**.
- However, from a broader economic perspective, the ToR underscores the **intergenerational equity principle** — ensuring that future taxpayers are not burdened by today's pension promises.
- This approach aligns with the **Fiscal Responsibility and Budget Management (FRBM)** framework, which seeks to contain revenue expenditure and debt accumulation.

Expert Perspective

- Public finance experts view the 8th CPC's ToR as a **mature fiscal reform step**, aligning India's compensation and pension systems with **global best practices**.
- By mandating the consideration of **unfunded pension liabilities**, the government is institutionalising a **fiscally responsible pay revision model**, where employee welfare is balanced with the need for **developmental fiscal space**.
- At the same time, they note that the 8th CPC must also **ensure fair wage growth**, particularly in the lower and middle pay bands, to maintain morale, productivity, and parity with inflation trends.

Unified Pension Scheme (UPS)

- The Unified Pension Scheme (UPS) was introduced by the Union Government in 2024 following recommendations of the T.V. Somanathan Committee.
- It aims to address employee dissatisfaction with the National Pension System (NPS) while ensuring fiscal sustainability – avoiding a return to the Old Pension Scheme (OPS), which was non-contributory and fiscally burdensome.

Key Features of UPS

Feature	Description
Assured Pension	50% of the average basic pay (plus DA) drawn over the last 12 months before retirement for a minimum of 25 years of service; proportionately reduced for 10–25 years of service.
Minimum Pension	Guaranteed ₹10,000 per month for employees retiring with at least 10 years of service.
Family Pension	60% of the pension last drawn by the retiree to be paid to the surviving spouse/family.
Inflation Indexation	Dearness relief linked to the All India Consumer Price Index for Industrial Workers (CPI-IW).
Lump-sum Payment	On retirement, a lump sum equal to 1/10th of monthly emoluments (pay + DA) for every 6 months of completed service, in addition to gratuity, without affecting the pension amount.
Employee Contribution	10% of basic pay + DA.

Government Contribution

18.5%.

Choice of Scheme

Employees can choose between NPS and UPS only once; the option is irreversible.

National Pension System (NPS)

- The NPS was introduced on 1 January 2004, replacing the Old Pension Scheme for Central Government employees (except armed forces).
- It is regulated by the Pension Fund Regulatory and Development Authority (PFRDA) under the PFRDA Act, 2013.

Key Features

Feature	Description
Nature	Defined contribution scheme – market-linked returns, not guaranteed.
Employee Contribution	10% of basic pay + DA.
Government Contribution	14% of basic pay + DA (for Central Government employees).
Investment Options	Subscribers can choose investment mix and pension fund manager.
Withdrawals	Up to 60% of the corpus can be withdrawn tax-free at retirement; remaining 40% used to buy annuity.
Tax Benefits	Deductions up to 14% of government contribution under the Income Tax Act, 1961 (both old and new regimes).
Regulator	Pension Fund Regulatory and Development Authority (PFRDA).

Key Differences: UPS vs. NPS vs. OPS

Feature	Old Pension Scheme (OPS)	National Pension System (NPS)	Unified Pension Scheme (UPS)
Nature	Non-contributory, defined benefit	Contributory, defined contribution	Contributory, partially guaranteed
Pension Formula	50% of last basic pay + DA	Market-based annuity	50% of average of last 12 months' basic pay + DA
Employee Contribution	None	10% of basic + DA	10% of basic + DA
Government Contribution	100% (fully funded by govt.)	14%	18.5%
Minimum Pension	₹9,000 per month	None (market-dependent)	₹10,000 per month
Family Pension	50–60% of pension	Based on annuity plan	60% of last drawn pension
Inflation Indexation	Yes (Dearness Relief)	No guaranteed indexation	Yes, linked to CPI-IW
Lump-sum Payment	40% commutation allowed	Up to 60% withdrawal	Additional lump sum (1/10th of monthly pay per 6

			months of service)
Tax Benefits	No contribution, hence no deduction	Up to 14% govt. contribution deductible	Not yet clarified
Fiscal Impact	Unfunded, high burden	Low, funded	Moderate, partially funded
Social Security Level	High	Moderate	High (with fiscal balance)

Conclusion:

- The **8th Central Pay Commission** reflects an evolving governance approach where **economic sustainability, fiscal prudence, and public sector efficiency** guide administrative decisions.
- While employee unions continue to advocate for the **Old Pension Scheme**, the government's policy direction is clear: the **future of India's pension architecture lies in contributory, partially funded models**, not in fiscally burdensome, unfunded entitlements.

INTERNATIONAL RELATIONS

Significance of Donald Trump's executive order assuring US support to Qatar

Source: New Indian Express

UPSC Relevance: GS1 International Relations

Context: US support to Qatar

Why in News?

In September 2025, US President Trump signed an executive order guaranteeing Qatar's security after Israeli strikes targeted Hamas leaders in the country.

Introduction

- The US President **Donald Trump** signed an executive order titled "Assuring the Security of the State of Qatar", guaranteeing Qatar's security against any armed attack and framing such an attack as a threat to **US peace and security**.
- This step came **three weeks after Israeli airstrikes in Qatar targeting Hamas leaders**, which the Qatari government termed "state terror." The US pledged to take "all lawful and appropriate measures" – diplomatic, economic, or military – to protect Qatar if attacked.

Balancing Act with Israel

- The order comes **amid heightened Israel-Qatar tensions** following Israeli strikes on Qatari territory.
- Qatar has long **hosted Hamas' political office**, with US approval, and has played

a mediatory role in the **Israel-Gaza conflict**.

- Trump used the order alongside a **20-point plan to end the Gaza conflict**, including facilitating a call where Israeli PM Netanyahu apologized to Qatar – a significant diplomatic concession after initial threats of further attacks.
- **Significance:** The US sought to **protect Qatar without directly antagonizing Israel**, showing its attempt to **balance strategic relations in the Middle East**.



(Image Source: Indian Express)

NATO-level Assurance for a Non-NATO Ally

- In **2022**, Qatar was designated a **Major Non-NATO Ally (MNNA)** by the US, reflecting strategic importance, especially given its role in the **Afghan withdrawal** and hosting **Al-Udeid Air Base**, the largest US military base in the Middle East.
- The language of the order mirrors **NATO's Article 5**, which treats an attack on any member as an attack on all, emphasizing **joint contingency planning and coordinated response**.

with US military and intelligence.

- **Significance:** The order provides Qatar with **unprecedented security assurances**, usually reserved for NATO members, enhancing US deterrence and regional influence.

Highlights Trump's Proximity to Qatar

- The executive order reflects **Trump's personal and economic connections** to Qatar:
- Trump Organization investments in Qatar.
- May 2025 visit led to **\$1.2 trillion economic agreements**.
- Gifted **\$400 million Boeing 747** from Qatari royal family, which Trump designated for Air Force One.
- **Significance:** Qatar leveraged its **strategic value and personal ties with Trump** to secure protections not extended to other Arab allies, e.g., Saudi Arabia, showing **personal diplomacy influencing US foreign policy**.

Executive Order Not Legally Binding

- Unlike treaties, executive orders **do not require Senate approval** and can be **repealed by a future president**.
- The order **formalizes a promise at the executive level**, giving flexibility to the US president to act militarily, diplomatically, or economically.
- **Significance:** It signals **strong political commitment**, but lacks **long-term legal guarantees**, creating uncertainty for Qatar's security assurance.

Strategic Implications

- Strengthens **US-Qatar bilateral relations**, reinforcing Qatar's role as a **mediator in the Israel-Hamas conflict**.
- Sends a **deterrent signal to potential**

aggressors, including Israel, by **linking Qatar's security with US interests**.

- Reflects US's **continuing engagement in Middle East security** through partnerships with key Gulf states.
- Exposes **political tensions within the US**, with some Republicans criticizing security guarantees to Qatar due to its links with **terrorist organizations** and human rights concerns.

India's Geopolitical Balancing in a Changing Global Trade Order

Source: The Hindu

UPSC Relevance: GS2 International Relations

Context: India's Geopolitical role in global trade

Why in News?

Recently, EAM S. Jaishankar emphasised that India's national interests are best secured through strategic autonomy and multi-alignment in a multipolar world.

Background:

- On October 6, 2025, at the **launch of the Aravalli Summit** at Jawaharlal Nehru University's School of International Studies (SIS) – marking its 70th anniversary – **External Affairs Minister (EAM) Dr. S. Jaishankar** emphasised that **India's national interests are best secured by "strategic autonomy"** rather than exclusive alignment with any one power bloc.

What is "Strategic Autonomy"?

- Strategic autonomy refers to **India's ability to take independent foreign-policy decisions** guided by **national interests**, without being constrained by military, economic, or ideological

alignments with major powers.

- **Historical roots:** The policy emerged during the **Cold War**, shaped by the **Non-Aligned Movement (NAM)** under leaders like Jawaharlal Nehru.
- **Evolution:** While NAM emphasised neutrality between blocs, **strategic autonomy is more pragmatic**, enabling India to cooperate flexibly with all partners (a concept often described as **multi-alignment**).

Historical Precedent: The 1971 Indo-Soviet Treaty

- Jaishankar recalled India's decision during the **1971 Bangladesh Liberation War** to sign the **Treaty of Peace, Friendship and Cooperation with the Soviet Union**.
- At that time, India faced a **"triangular threat" from the U.S. and China**, which supported Pakistan.
- Aligning with the USSR was a **"necessary choice in the national interest"**, illustrating that autonomy means **choosing partners based on circumstances, not ideology**.
- This decision strengthened India's strategic security during a major crisis.

Key Points from Jaishankar's Address

(a) Multi-Alignment and Multipolarity

- The world is no longer bipolar or unipolar; **emerging multipolarity** demands that countries like India **diversify partnerships**.
- Recent **U.S. tariff impositions** and global volatility prove that **relying on one power can be risky**.
- Multi-alignment enables India to **"maximise its options and maintain freedom of choices."**

(b) Preserving Autonomy amid U.S. Pressure

- While India seeks closer ties with the U.S., Jaishankar underlined that relations **"cannot come at any cost."**
- **Trade negotiations** must respect India's **"red lines."**
- On **Russian oil imports**, India prioritises **energy security and affordability**, balancing relations with both the U.S. and Russia.

(c) Neighbourhood First Policy

- India should **"underwrite the infrastructure for cooperation"** with its neighbours — roads, railways, energy grids, people-to-people movement — to become the **"go-to option"** for the region.
- Except for **one problematic neighbour (implied Pakistan)**, India has brought **"transformational changes"** in regional connectivity.
- Managing neighbours is about **"managing relationships to national advantage, not merely solving problems."**

(d) India-Pakistan Equation

- India cannot **"wish away a difficult neighbour"**; managing Pakistan remains a **strategic reality**.
- Jaishankar stressed that **the world no longer draws equivalence between India and Pakistan**, despite recent developments like Operation Sindoor and shifting Saudi-China-Turkiye engagement with Islamabad.



(Image Source: Nice Nepal)

Significance of Jaishankar's Position

(i) For India's Foreign Policy

- Reaffirms the doctrine that **foreign policy is interest-driven**, not alliance-bound.
- Provides intellectual justification for India's **purchase of Russian oil, participation in QUAD, and engagement with Global South** simultaneously.

(ii) For Global South Leadership

- Shows that **middle powers** like India can retain agency amid great-power rivalries.
- Highlights the demand for **reform of global governance institutions** to reflect multipolar realities.

(iii) For Regional Diplomacy

- Strengthens the case for **neighbourhood development assistance** to counter Chinese influence.
- Encourages India to act as a "**net security provider**" in the Indian Ocean and South Asia.

Challenges to Strategic Autonomy

- **Economic interdependence:** Heavy reliance on energy imports and trade ties with the U.S./EU.
- **Geopolitical pressures:** Western sanctions on Russia, China's assertiveness, and Middle-East instability.
- **Technology dependence:** Need for cooperation in critical tech (semiconductors, defence, AI).
- **Regional instability:** Fragile governments in neighbours like Sri Lanka, Nepal, and Afghanistan.

Policy Implications

- Continue to **diversify energy sources** and defence partnerships.

- Invest in **regional connectivity and infrastructure financing** to enhance goodwill and reduce neighbours' dependence on external powers.
- Strengthen **domestic capabilities (Atmanirbhar Bharat)** to reduce vulnerability to external pressure.
- Promote **rule-based multilateralism** and **reforms in WTO, UNSC, IMF** to secure developing countries' interests.

Conclusion:

As the **global order becomes more fragmented**, India's emphasis on **strategic autonomy, multi-alignment, and neighbourhood development** provides a roadmap to safeguard sovereignty, optimise choices, and enhance India's global stature.

UNESCO's Executive Board nominates Khaled El-Enany: significance, context and implications

Source: Indian Express

UPSC Relevance: GS2 International Relations

Context: About UNESCO

Why in News?

UNESCO's Executive Board nominated Egypt's former Minister of Antiquities, Khaled El-Enany, as its candidate for Director-General, pending approval by the General Conference.

Introduction

- On 6 October 2025, UNESCO's Executive Board nominated **Khaled El-Enany**, former Egyptian Minister of Antiquities and Tourism, as its candidate for Director-General. The nomination now goes to the UNESCO General Conference for final appointment.

What happened – procedural facts

- The UNESCO Executive Board, in its 222nd session, voted to nominate Khaled El-Enany for the post of Director-General.
- El-Enany defeated his main rival, Édouard Firmin Matoko of the Republic of Congo.
- The final appointment will be decided by UNESCO's General Conference in Uzbekistan next month.



(Image Source Indian Express)

Candidate profile

- **Professional background:** Khaled El-Enany is an Egyptologist and academic. He served as Egypt's Minister of Antiquities (2016–2019) and later as Minister of Tourism and Antiquities. He led major cultural and museum projects in Egypt.
- **Support base:** He has backing from the African Union and the Arab League. His supporters argue that his outsider status in the UN system may help him implement reforms effectively.

Broader context

- **Funding crisis:** The nomination follows the United States' withdrawal from UNESCO in July 2025, creating a significant budgetary gap.
- **Regional representation:** If confirmed, El-Enany would be the first Arab Director-General, marking a milestone in

regional representation.

- **Reform expectations:** Member states expect the incoming DG to pursue institutional reforms, diversify funding, and strengthen transparency.

Key challenges

- **Budget shortfall and funding diversification.**
- **Perception of politicisation:** Ensuring technical credibility while addressing political criticism.
- **Operational reforms:** Strengthening administrative efficiency, programme delivery, and results-orientation.
- **External relations:** Engaging major donors, regional blocs, and balancing geopolitical influences.

Implications for India

- **Heritage and technical cooperation:** Changes in UNESCO priorities or funding could affect India's World Heritage projects and cultural programmes.
- **Diplomatic engagement:** India can use cultural diplomacy, technical assistance, and coalition-building to maintain influence in UNESCO decision-making.

Policy recommendations

- **For UNESCO leadership:**
 - Ensure rapid and transparent fiscal planning.
 - Strengthen independent technical arms of UNESCO to insulate programmes from political pressure.
 - Diversify donor base while safeguarding independence.
- **For India:**
 - Protect technical norms in World Heritage processes.
 - Offer capacity-building partnerships to maintain visibility.

- Engage in coalition-building to influence UNESCO priorities.

Conclusion:

- The nomination of Khaled El-Enany is both symbolic and institutional. It highlights Arab representation in UNESCO and comes at a time of financial and political challenges.
- Effective leadership will require balancing funding, governance reforms, and member-state expectations while safeguarding UNESCO's mission in education, science, and culture.

India's Strategic Autonomy in a Multipolar World

Source: Indian Express

UPSC Relevance: GS2 International Relations

Context: India's Strategic Autonomy

Why in News?

US tariffs on Russian oil imports via India highlight the challenges of global trade uncertainty and India's strategic balancing between the West and other powers.



(Image Source: The Indian Express)

Introduction

- The recent US tariffs on Russian-origin oil imported by India have highlighted the growing use of trade measures as instruments of geopolitical strategy.

- This has brought attention to India's balancing role in a changing global trade order amid rising uncertainty and protectionism.

Changing US Trade Policy

- According to Landau, US trade actions focus on **protecting "old-style" industries** (like steel, aluminium, manufacturing) instead of leveraging its **comparative advantage in high-tech sectors**.
- Short-term effects of tariffs appear limited, but **long-term uncertainty** is "toxic":
 - Corporations hesitate or suspend investments.
 - Uncertainty weakens confidence in markets.
 - Effects are **slow to appear but hard to reverse** once entrenched.
- US-EU trade arrangements are often **security-driven rather than purely economic**.
- Landau warns that a proliferation of **ad-hoc deals** with different countries, driven by geopolitical motives, risks fragmenting global trade norms.

India's Russian Oil Imports & US Tariffs

- **India increased Russian oil imports** after the Ukraine war, benefiting from discounted crude.
- The US responded by imposing **tariffs on products refined from Russian oil**, including those re-exported by India.
- Landau's concerns:
 - **Tariffs as geopolitical coercion** are counterproductive; they introduce **volatility and distrust** in the trading system.
 - Sanctions may sometimes be used as alternatives to military conflict, but **tariffs disrupt trade flows and**

investments.

- India, as a **stabilising force in geopolitics**, may sometimes take steps **not aligned with Western preferences**, which is natural for a balancing power.
- He warns the West not to perceive India's balancing act as conflict with Western goals.

India's Geopolitical Balancing Act

- Landau calls India a key **"force for equilibrium and stabilisation"** in global affairs:
- India's foreign policy seeks **strategic autonomy** – maintaining relations with both the **West (US, EU)** and the **Global South (Russia, Africa)**.
- This positioning benefits global stability but can also **create friction with Western partners**.
- **Key concern:** India's efforts at balancing **should not take it too far away from the Western world**, which could undermine its technology and investment partnerships.
- **Optimistic note:** India's **technology, industrious workforce, and adaptability** make it well-positioned for continued growth.

Globalisation: Winners, Losers & the African Challenge

- Despite criticisms, Landau insists **globalisation has lifted billions out of poverty** and must not be abandoned.
- **Africa** will be a crucial region for the future:
 - Its population is projected to **double in 30 years**.
 - Growth opportunities in Africa will largely depend on **continued globalisation**.
 - A stagnating Africa could lead to

global social, economic, and migration crises.

- India's growing interest in Africa could make it a **bridge between globalisation and African development**.

China's Bid to Lead Global Trade

- China aims to offer an **"alternative globalisation model"** to challenge the US-led system.
 - Its main instrument has been the **Belt and Road Initiative (BRI)**:
 - Successful for China's influence but **disruptive for global trade flows**.
 - Contrary to earlier hopes, China has **not co-managed global systems with other nations**.
 - Landau stresses the need for the **global community to integrate China's ambitions** within a coherent framework to prevent further fragmentation.

Implications for India

- **Opportunities**
 - **Leverage strategic location:** India can serve as a **bridge between the West and Global South**.
 - **Technology-driven growth:** India's innovation ecosystem and demographic advantage support its rise in global supply chains.
 - **African outreach:** Collaborating with Africa offers new markets and strengthens India's global standing.
- **Challenges**
 - **Balancing energy security and Western alignment:** Dependence on Russian oil must be weighed against Western sensitivities.
 - **Navigating uncertainty in global trade:** India must protect its export-oriented industries from tariff shocks.

- **Competing with China's influence:** India needs alternative initiatives to BRI, such as the **India-Middle East-Europe Economic Corridor (IMEC)**.

Gaza: Erasure of Cultural Heritage Amid Conflict

Source: The Hindu

UPSC Relevance: GS2 International Relations:

Context: Gaza Conflict and Cultural impact

Why in News?

Ongoing Israeli military operations in Gaza have caused massive civilian casualties and widespread destruction of historical, religious, and cultural sites, threatening Palestinian heritage and identity.

Introduction

- The ongoing conflict in Gaza, which escalated after October 7, 2023, when Israel declared a state of war in response to cross-border attacks by Hamas, has not only caused massive human casualties but has also devastated Gaza's rich cultural heritage.
- Over two years of sustained military offensives, Israel has targeted strategic sites, including urban centres, historical landmarks, and civilian spaces.
- According to the Palestinian Ministry of Health, the human toll has reached **67,160 deaths**, with thousands of families entirely wiped out.
- Beyond the human tragedy, Gaza's **civilizational and cultural heritage** has faced systematic destruction, raising serious concerns about compliance with international conventions such as the **1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict**.

The Scope of Cultural Destruction

UNESCO's preliminary assessment (August 2025) highlights that **110 cultural and historical sites** in Gaza have been damaged, including:

- **Religious sites:** 13
- **Buildings of historical/artistic interest:** 77
- **Monuments:** 9
- **Museums:** 1
- **Archaeological sites:** 7
- **Depositories of movable cultural property:** 3
- This widespread damage represents not just physical destruction but also the obliteration of Gaza's **historical memory, identity, and social fabric**, echoing the International Criminal Court's assertion that attacks on cultural heritage can erode fundamental aspects of humanity.

Key Cultural Sites Targeted

1. Great Omari Mosque

- Dating back to the **7th century**, it is the **second-oldest mosque in Palestine**.
- The site previously hosted a temple, a Byzantine church, and later structures under Crusader and Mamluk rule.
- Its **Mamluk and Ottoman-era inscriptions** and decorations were significantly damaged in a December 2023 Israeli attack.

2. Al-Qissariya (Gold) Market

- Established during the Mamluk dynasty in the 14th century, adjacent to the Omari Mosque.
- Known for its narrow lanes and gothic-style arches, it served as a hub for local commerce and cultural exchange.
- Destroyed in the same bombardment that hit the Great Omari Mosque.

3. Church of Saint Porphyrius

- A **Greek Orthodox church** dating to the

5th century Byzantine period.

- Converted into a mosque in the 7th century and restored to a church during the 12th-century Crusades.
- In October 2023, it sheltered hundreds of displaced Palestinians, yet suffered a bombardment killing at least 18 civilians.

4. Pasha's Palace (Qasr al-Basha)

- A **17th-century Mamluk-Ottoman palace**, also known as Radwan Dynasty Castle.
- Housed a museum with artefacts from Greek, Roman, Byzantine, and Islamic periods.
- Reduced to rubble after Israeli strikes in December 2023.

5. Hamam al-Sammara

- Gaza's **only surviving traditional Turkish bath**, restored in 2023 with UN support.
- Its domed roof and coloured glass represented a historic architectural style, destroyed in December 2023 strikes.



(Image Source: the Hindu)

6. Rashad Al-Shawa Cultural Center

- Built in **1985**, it was a hub for theatre, literature, and free expression.
- Hosted peace talks in 1990 between PLO leader Yasser Arafat and U.S. President Bill Clinton.
- Destroyed in November 2023, curbing cultural expression and civic engagement.

7. Deir al-Balah War Cemetery

- Contains **724 Commonwealth burials**, including an Indian section from World War I.
- About **10% of headstones** have been damaged since the conflict began.

8. Al-Ahli Arab Baptist Hospital

- Gaza's **only Christian-run hospital** and sole cancer-treatment provider.
- Struck repeatedly in Israeli airstrikes, causing civilian casualties and service disruptions.

9. Bureij Mosaic

- A **Byzantine-era mosaic** discovered in 2022, covering 500 sq. m., dating from the 5th–7th centuries.
- Initially preserved by archaeologists, it has since suffered damage due to ongoing bombardments.

Analytical Perspective

1. Violation of International Norms

- Israel is a signatory to the **1954 Hague Convention**, which mandates protection of cultural heritage during armed conflicts.
- The deliberate or indiscriminate targeting of historical and civilian sites violates **international humanitarian law** and principles of proportionality.

2. Cultural Genocide

- Beyond physical casualties, the destruction of heritage represents an **erasure of identity** and continuity for the Palestinian people.
- Bombing of cemeteries, archives, libraries, and cultural centres parallels aspects of **cultural genocide**, as recognized under international law.

3. Long-term Societal Impact

- Loss of educational, religious, and cultural landmarks weakens **inter-generational transmission of history**.
- Erasure of shared spaces such as

markets, baths, and theatres hampers **community cohesion** and social resilience.

4. Urban and Civilizational Erosion

- UNESCO terms the phenomenon ‘**urbicide**’ – the systematic destruction of a city’s cultural and civic identity.
- Gaza exemplifies urban and cultural erosion, where repeated bombardments reduce historical urban structures to rubble, leaving civilians without physical or symbolic anchors to their heritage.

Conclusion:

- The destruction of Gaza’s cultural heritage illustrates how modern conflicts extend beyond the battlefield to **target identity, history, and memory**. While the human cost remains staggering, the cultural devastation risks **erasing centuries of civilization**, making post-conflict reconstruction far more challenging.

India to Expand Solar Pumps Scheme to Africa and Island Nations

Source: The Hindu

UPSC Relevance: GS2 International Relations

Context: PM-KUSUM Solar Pumps in Africa and Island Nations

Why in News?

India plans to promote its PM-KUSUM and PM Surya Ghar programmes in Africa and island nations through the International Solar Alliance, showcasing solar irrigation and rooftop solar solutions.

Introduction

- India plans to showcase its **PM-KUSUM (Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan)** and **PM Surya Ghar** programmes in African countries and island nations through the **International Solar Alliance (ISA)** platform.
- This initiative highlights India’s renewable energy leadership and potential for international cooperation in sustainable agriculture and energy access.

About PM-KUSUM

- **Objective:** Launched in 2019, PM-KUSUM is a **₹34,000-crore programme aimed at promoting solar energy in agriculture**, thereby reducing farmers’ dependence on conventional electricity and fossil fuels, and enhancing energy security.
- **Components:**
 - 100 GW solar power plants on farmer-owned land.
 - Installation of 14 lakh standalone solar pumps.
 - Solarisation of 35 lakh grid-connected agricultural pumps.
- **Targets and Progress:**
- Original target: 308 GW by 2022; revised to 348 GW by March 2026.
- As of September 2025:
- **Standalone solar pumps:** ~70% installed (successful).
- **Grid-connected solar pumps:** 16–25% installed (slow progress).
- **Decentralised renewable energy plants:** ~6% installed.
- The scheme may be **extended beyond 2026** to achieve remaining targets.



(Image Source: the Hindu)

International Outreach

- **ISA Platform:** India intends to **showcase PM-KUSUM and PM Surya Ghar programmes** to countries facing energy and connectivity challenges, particularly in Africa and island nations.
- **Significance for Africa:**
 - Only **4% of arable land in Africa is irrigated**, leading to high dependency on food imports (~\$400 billion).
 - India's experience with solar pumps demonstrates how **solar-powered irrigation** can enhance agricultural productivity, reduce costs, and promote food security.
 - Indian solar pump technology presents **investment opportunities** for renewable energy companies in these regions.
 - **Regional Collaboration:** By sharing expertise in solar irrigation and rooftop solar, India strengthens **South-South cooperation**, positioning itself as a **renewable energy leader** while contributing to global sustainable development goals (SDGs).

Challenges and Lessons from PM-KUSUM

- **Implementation Gaps:** While standalone solar pumps are progressing

well, **grid-connected systems and decentralised renewable plants face delays** due to infrastructure and coordination issues.

- **Policy and Funding:** The success of PM-KUSUM depends on continued **government support, funding, and monitoring**, as well as **private sector participation** in supply, installation, and maintenance.
- **Scaling Impact:** Extending the programme internationally requires adapting **technology and financial models** to local conditions, particularly in regions with weaker grid infrastructure.

Significance and Analysis

- **Energy and Agriculture Nexus:** PM-KUSUM demonstrates a **synergistic approach**, linking renewable energy with agricultural productivity, thereby addressing multiple challenges:
 - Reducing fossil fuel dependence.
 - Lowering irrigation costs for farmers.
 - Promoting sustainable agriculture.
- **Climate and SDG Alignment:**
 - Contributes to **SDG 7 (Affordable and Clean Energy)** and **SDG 2 (Zero Hunger)**.
 - Supports India's **climate action commitments** by reducing greenhouse gas emissions in agriculture.
- **Geopolitical and Economic Impact:**
 - Enhances India's **soft power** through renewable energy diplomacy.
 - Opens **markets for Indian solar technology** and services abroad, fostering economic and technological cooperation.
- **Innovation in Rural Development:**
 - PM Surya Ghar's rooftop solar initiative and standalone solar

pumps show **scalable models** for **rural electrification and irrigation**.

- Digital monitoring and maintenance systems increase efficiency and adoption.

Conclusion:

- The **PM-KUSUM programme**, coupled with **international promotion** via the **ISA**, represents a **strategic blend** of **domestic reform** and **global outreach**.

India's Evolving Diplomatic Engagement with Afghanistan's Taliban

Source: The Hindu

UPSC Relevance: **GS2 International Relations**

Context: **Indian Taliban Relations**

Why in News?

Afghan Acting Foreign Minister Amir Khan Muttaqi is on visit to India from October 9–16, 2025, marking the first official visit by a top Taliban leader since their return to power in 2021.



(Image Source: Indian Express)

Introduction

- The visit highlights India's **cautious engagement strategy** with the Taliban, aimed at securing **strategic space in Afghanistan** while balancing **ethical** and **security concerns**.

Background

- **India-Taliban interactions** are not new. Initial contact dates back to the late **1990s**, notably during the **IC-814 hijacking crisis** in **1999–2000**.
- However, India's engagement was limited due to the Taliban's strong alignment with **Pakistan** and its **regressive policies**, particularly toward **women** and **minorities**.
- Post-2021, following the **Taliban takeover of Kabul**, India adopted a "**cautious engagement**" approach. The reopening of the **technical mission** in **June 2022** signaled India's intent to maintain a foothold in Afghanistan, primarily through **humanitarian** and **development assistance**.
- Despite this, India has been slow to provide **visas** or engage extensively in **bilateral trade** and **investment**, reflecting a **policy inertia** rooted in the **recognition vs engagement debate**.

Objectives of India's Engagement

- **Humanitarian Assistance:** India has consistently provided **aid** to Afghanistan, including **wheat**, **medicines**, **vaccines**, and **disaster relief**. The focus is on alleviating the hardships of **Afghan citizens** rather than endorsing **Taliban governance**.
- **Strategic Presence:** By engaging with the Taliban, India aims to secure **strategic space** in Afghanistan, ensuring that it is not entirely dominated by rival powers such as **China** and **Pakistan**. The visit is timely as shifting **geopolitical dynamics**—Pakistan's deteriorating position, China's **diplomatic outreach**, and US **strategic recalibration**—create an opportunity for India.
- **Infrastructure and Development Support:** India seeks to provide

technical and institutional assistance in agriculture, industry, water management, health, and MSME development. Emphasis is on promoting sustainable development through Small Development Projects (SDPs) and facilitating trade via Chabahar port.

- **Regional Cooperation and Stability:** India aims to engage in dialogue to strengthen Afghanistan's connectivity with South and Central Asia, positioning the country as a land bridge that supports regional trade and transit.

Challenges and Constraints

- **Recognition Dilemma:** India does not officially recognize the Taliban regime due to its domestic and international legitimacy issues, especially concerning human rights, women's education, and minority representation.
- **Security Concerns:** There is apprehension regarding Afghan visa issuance due to security risks, which limits the mobility of Afghan students, professionals, and patients.
- **Policy Inertia:** Despite years of engagement, India's diplomatic footprint in Afghanistan remains limited, with minimal staff and a technical mission that struggles to implement development projects effectively.
- **Competing Regional Interests:** China, Pakistan, Iran, Russia, and the US are all active in Afghanistan, creating a complex geopolitical environment. India must navigate these pressures while safeguarding its strategic and economic interests.

Significance

- India's engagement strategy reflects a realist approach, balancing national interest with ethical considerations.
- The Taliban's outreach, including

Muttaqi's visit, provides India an opportunity to secure influence in Afghanistan without formal recognition. Humanitarian aid and development projects serve as instruments of soft power, building goodwill among the Afghan population.

- However, lessons from the two decades of engagement with the previous Afghan government highlight the need for institution-building, accountability, and sustainability in aid delivery.
- India's current cautious posture may result in missed opportunities if other powers deepen their presence in Afghanistan.
- A calibrated approach combining strategic engagement, economic cooperation, and people-centric initiatives could help India maintain influence while adhering to its values.

India-Taliban Relations

Taliban Rule (1996–2001):

- During the Taliban's first regime, India did not establish formal diplomatic ties. Instead, it supported the Northern Alliance, the main opposition group.
- The Taliban, however, assisted India during the 1999 hijacking of Indian Airlines Flight 814, enabling the safe release of hostages.

Pre-August 2021:

- India engaged in multilateral and peace initiatives to maintain its presence in Afghan affairs. The Moscow Dialogue (2017) brought together Afghanistan, China, India, and other stakeholders to facilitate reconciliation efforts.
- In 2020, India participated in intra-Afghan peace talks in Doha, marking a significant step in engagement with the Taliban.

Post-August 2021:

- After the Taliban regained power, India began **cautious engagement**. In **August 2021**, the **Indian Ambassador to Qatar** met Taliban representatives in Doha.
- By **June 2022**, the **Joint Secretary for Pakistan, Afghanistan, and Iran** held talks with Taliban leaders, paving the way for a **technical team at the Indian Embassy in Kabul**, allowing **direct engagement with Taliban ministers and officials**.
- India also permitted the Taliban to **appoint a new Afghan Consul General in Mumbai**.

Strategic Importance of Afghanistan for India

1. **Gateway to Central Asia:** Afghanistan provides a route via **Chabahar Port** to access the **energy-rich and economically significant Central Asian region**, reducing dependence on **Pakistan and China**.
2. **Geopolitical Advantage:** Afghanistan shares borders with **Pakistan, Iran, Turkmenistan, Uzbekistan, Tajikistan, and China**, making it strategically vital.
3. **Countering Pakistan's Influence:** India's presence in Afghanistan enhances its **regional influence** and strategic position in **South and Central Asia**.
4. **Counter-Terrorism Efforts:** Engagement in Afghanistan strengthens India's **leadership role in combating terrorism and extremism** in the region.
5. **Mutual Development Benefits:** India has invested over **USD 3 billion** in Afghanistan, including **roads, dams, schools, hospitals, and the Parliament building**, benefiting both Afghans and India through **development cooperation**.

Challenges in India's Taliban Policy

1. **Terrorism Threats:** The Taliban takeover **destabilized Afghanistan**, strengthening extremist networks like the **Haqqani Network, al-Qaeda, and Lashkar-e-Taiba**, which pose **cross-border security threats** to India.
2. **Pakistan's Strategic Role:** Pakistan views India's presence in Afghanistan as a challenge to its **strategic depth policy** and alleges India supports **insurgencies in Balochistan and other regions**.
3. **Lack of Diplomatic Recognition:** India has **not officially recognized the Taliban**, due to their **non-inclusive government, human rights violations, and failure to control terrorism**, complicating formal diplomacy.
4. **Refugee Management:** The fall of Kabul triggered an **influx of Afghan refugees** into India, raising **security, resource, and integration challenges**, along with concerns about potential **radical elements**.

Way Forward

- Expand **SDPs and MSME support** to ensure **aid reaches local communities**.
- Facilitate **visas for Afghan students, patients, and professionals** in a secure manner.
- Strengthen **trade and connectivity initiatives** through **Chabahar port**.
- Enhance **institutional collaboration** for **water management, agriculture, and industrial development**.
- Maintain a **balanced stance** between **engagement and non-recognition** to safeguard India's **strategic autonomy**.

India to Host UN Troop Contributing Countries' Chiefs Conclave (UNTCC)

Source: The Hindu

UPSC Relevance: GS 2 International Relations

Context: Countries' Chiefs Conclave (UNTCC)

Why in News?

INDIA TO HOST THE UN TROOP CONTRIBUTING COUNTRIES' CHIEFS CONCLAVE FROM OCTOBER 14-16, 2025, TO DISCUSS CHALLENGES AND STRENGTHEN PEACEKEEPING OPERATIONS.

Introduction

- India will host the **United Nations Troop Contributing Countries' (UNTCC) Chiefs Conclave** in New Delhi from **October 14 to 16, 2025**, marking a significant event in the realm of international peacekeeping and multilateral cooperation.
- The conclave, hosted by the **Indian Army**, will bring together **senior military leadership from 32 nations** actively contributing troops to United Nations peacekeeping missions worldwide.

About the UNTCC Conclave

- The **United Nations Troop Contributing Countries' Chiefs Conclave (UNTCC)** serves as a **high-level platform** for dialogue and cooperation among countries that provide military personnel to UN peacekeeping operations. It provides an opportunity to:
 - Address **operational challenges** in peacekeeping.
 - Discuss **evolving threats** in conflict zones.

- Enhance **interoperability** and **coordination** among troop-contributing nations.
- Promote **inclusivity in decision-making** within UN peacekeeping structures.
- Explore the **role of technology, innovation, and training** in modernizing peacekeeping efforts.
- This year's conclave emphasizes **collaboration, mutual learning, and collective response** to emerging global security issues.



(Image Source: PIB)

UN Peacekeeping

UN Peacekeeping is a UN mechanism to help conflict-affected countries build lasting peace, administered by the Department of Peace Operations (DPO). It is a key tool for maintaining international peace and security.

Core Principles:

- Consent of Parties** – Missions require the cooperation of main conflict parties.
- Impartiality** – Peacekeepers act fairly, upholding the UN Charter and mandate.
- Use of Force** – Limited to self-defense, mandate protection, or mission security.

Structure & Mandate:

- Authorization** – UN Security Council defines the mission and rules of engagement.
- Personnel** – Contributed voluntarily by member states; includes military, police,

and civilian staff ("Blue Helmets").

- **Financing** – Shared by member states according to economic capacity.
- **Leadership** – Headed by SRSG (political/diplomatic) and Force Commander (military).

Modern Roles:

- Protect civilians (POC)
- Facilitate political processes and peace agreements
- Disarmament, demobilization, and reintegration (DDR)
- Security sector reform (SSR) and rule of law
- Electoral support and human rights promotion

India's Role in UN Peacekeeping

- India has a **long and distinguished history** as one of the **largest and most consistent contributors** to United Nations peacekeeping missions since their inception in 1948. Key highlights of India's contributions include:
- **Over 2,75,000 Indian personnel** have served in **49 UN missions** across the globe.
- India was **one of the first countries** to send troops to UN peacekeeping operations.
- **Indian women peacekeepers** have broken barriers—such as the **all-women Formed Police Unit (FPU)** deployed in Liberia, which became a model for gender inclusion in peace operations.
- Indian peacekeepers have served with distinction in **Congo, Sudan, South Sudan, Lebanon, and Haiti**, among others.
- India has consistently advocated for **greater representation and voice of troop-contributing countries** in UN

decision-making processes.

- Thus, hosting the UNTCC reaffirms India's **commitment to global peace, stability, and multilateralism**.

Participants and Representation

- Delegations from **32 countries** will participate in the 2025 conclave. The list includes:
Algeria, Armenia, Australia, Bangladesh, Bhutan, Brazil, Burundi, Cambodia, Egypt, Ethiopia, Fiji, France, Ghana, Italy, Kazakhstan, Kenya, Kyrgyzstan, Madagascar, Malaysia, Mongolia, Morocco, Nepal, Nigeria, Poland, Rwanda, Sri Lanka, Senegal, Tanzania, Thailand, Uganda, Uruguay, and Vietnam.
- Key dignitaries include:
 - **Defence Minister Rajnath Singh**
 - **External Affairs Minister S. Jaishankar**
 - **Jean-Pierre Lacroix**, UN Under-Secretary-General for Peace Operations (USG-DPO)
- Their participation underscores the **strategic importance** of the conclave and India's growing leadership role in UN peacekeeping discourse.

Themes and Agenda

- The three-day conclave will feature **plenary sessions, bilateral meetings, and defence exhibitions**. Major discussion themes include:
- **Operational Challenges and Evolving Threats** – addressing asymmetric warfare, terrorism, and hybrid conflict zones.
- **Enhancing Interoperability** – improving coordination between multinational contingents.
- **Inclusivity and Representation** – ensuring fair participation of troop-

contributing countries in strategic decision-making.

- **Role of Technology and Training** – adopting new technologies such as drones, AI-based surveillance, and cyber-defence systems.
- **Capacity Building and Shared Learning** – exchange of best practices through demonstrations and defence showcases.
- A **defence exhibition** will highlight India's advancements in peacekeeping logistics, communication, and medical support systems. Cultural exchange programmes will also foster camaraderie among participating nations.

Philosophical and Diplomatic Context

- The conclave embodies the Indian civilizational ethos of *Vasudhaiva Kutumbakam* – “The world is one family”.
- It signifies:
 - India's belief in **collective security and shared prosperity**.
 - The country's proactive stance in promoting **multilateral diplomacy** and **South-South cooperation**.
- Its consistent call for **reform in global governance institutions**, ensuring fair representation for developing nations.
- Hosting this event in New Delhi underscores India's **strategic diplomacy**, leveraging its peacekeeping record to enhance global credibility and strengthen partnerships with fellow contributors.

Significance and Expected Outcomes

The 2025 UNTCC conclave is expected to:

- Strengthen **coordination mechanisms** between the UN and troop-contributing countries.
- Foster **shared understanding** of

emerging operational realities.

- Promote **innovation and capacity enhancement** in UN missions.
- Reinforce India's leadership role in **global peacekeeping frameworks**.
- Provide momentum for India's advocacy for a **greater say for TCCs** in mandate formulation and mission planning.
- Additionally, it will position India as a **bridge between developed and developing nations** in shaping future UN peacekeeping architecture.

Conclusion:

- India's hosting of the **United Nations Troop Contributing Countries' Chiefs Conclave (UNTCC) 2025** stands as a testament to its **unflinching commitment** to international peace, stability, and cooperation.

The India-United Kingdom Economic Partnership

Source: The Hindu

UPSC Relevance: GS2 International Relations

Context: India UK

Why in News?

India and the U.K. are strengthening their economic, defence, cultural, and educational ties through pragmatic and low-drama diplomacy, following Prime Minister Keir Starmer's 2025 visit.

Introduction

- The evolving economic relationship between India and the United Kingdom (U.K.) stands as a model of pragmatic and mature diplomacy.
- At a time when international negotiations are increasingly defined by

populism, protectionism, and diplomatic friction, India and the U.K. have quietly strengthened their economic and strategic ties.

- The recent visit of U.K. Prime Minister **Keir Starmer** to India in October 2025 marks another significant milestone in this steady, result-oriented partnership.

Background: A Relationship Built on Common Ground

- India and the U.K. share a long historical and institutional relationship rooted in shared democratic values, common law traditions, the English language, and people-to-people ties.
- In recent years, this partnership has been revitalized by mutual economic interests, particularly after the U.K.'s exit from the European Union (Brexit).
- The U.K. is keen to expand trade partnerships beyond Europe, while India seeks to diversify its global economic linkages and attract technology, defence, and education investments.
- The two countries signed a **comprehensive trade deal in July 2025**, which now forms the foundation of a deeper economic engagement.



(Image Source: Deccan Chronicle)

Key Outcomes of Prime Minister Keir Starmer's Visit

- Sir Keir Starmer's **two-day visit to India** in October 2025 brought together a high-

level delegation of over **100 entrepreneurs, cultural representatives, and university vice-chancellors**, signaling a whole-of-society approach to strengthening bilateral cooperation.

1. Defence Cooperation

- A **£350 million missile supply deal** was finalized, enhancing India's defence modernization drive.
- This aligns with India's current fiscal priorities, where defence acquisitions are increasingly being prioritized over capital expenditure in other areas.
- The partnership in defence not only bolsters India's capabilities but also supports U.K.'s defence manufacturing exports post-Brexit.

2. Bilateral Investments

- **64 Indian companies** have committed to investing **£1.3 billion in the U.K.**, showcasing India's growing role as an investor in global markets.
- Although the Indian government has not yet disclosed reciprocal U.K. investments in India, companies such as **Rolls-Royce** have expressed strong enthusiasm for deepening their presence in India.
- The trend reflects the mutual confidence of both nations in each other's economic stability and long-term prospects.

3. Cultural and Creative Collaboration

- Sir Starmer's visit to **Yash Raj Films (YRF)** studios in Mumbai led to an agreement for **three Indian films to be shot in the U.K.**, expanding soft power ties and boosting the U.K.'s creative economy.
- Such collaborations enhance tourism, cultural diplomacy, and people-to-people engagement.

4. Educational Partnerships

- Two leading U.K. universities

announced plans to **establish campuses in India**, in line with the **National Education Policy (NEP) 2020**, which promotes internationalization of higher education.

- This move signifies a major leap in academic collaboration and knowledge exchange between the two countries.

Trade and Economic Landscape

- Despite the positive trajectory, there remains **untapped potential** in India-U.K. trade relations:
 - India accounts for **less than 2%** of the U.K.'s total merchandise exports.
 - The U.K. accounts for around **3% of India's exports**.
- This indicates significant scope for growth. Expanding trade volumes could also help India cushion against the adverse effects of **U.S. tariffs** – currently at a punitive 50% – on certain exports.
- A stronger India-U.K. corridor can thus serve as a stabilizing factor in India's global trade diversification strategy.

Contrasting Diplomatic Styles

- The India-U.K. partnership stands out for its **measured and businesslike approach**, especially when compared with India's experiences with other global partners:
- **India-U.S. negotiations** have often been **fraught and erratic**, marked by unpredictability and changing deal contours.
- **India-EU discussions**, while less volatile, have been **slow-moving** with discrepancies between public assurances and private negotiation stances.
- In contrast, India and the U.K. have demonstrated a **mature, low-drama, and pragmatic diplomacy**, where outcomes

matter more than optics.

The Role of the Indian Diaspora

- The **Indian-origin community in the U.K.**, the country's largest ethnic minority, plays a crucial role in strengthening bilateral ties.
- Their contributions to politics, business, academia, and culture foster a positive environment for deeper engagement.
- Prime Minister Starmer's outreach to Indian cultural and business leaders reflects an acknowledgment of this community's influence in bridging the two economies.

Significance of the Evolving Partnership

The current phase of India-U.K. relations exemplifies how two **mature democracies** can:

- Pursue strategic and economic cooperation **without ideological friction**,
- Focus on **results over rhetoric**, and
- Leverage **complementary strengths** in technology, defence, education, and culture.
- This pragmatic engagement model demonstrates a blueprint for **modern international diplomacy** – where cooperation is driven by shared economic interests and mutual respect rather than geopolitical posturing.

Challenges and the Way Forward

Despite positive momentum, several challenges persist:

- Need for **greater transparency** in investment commitments.
- Addressing **non-tariff barriers** and regulatory hurdles that impede trade.
- Ensuring **reciprocal market access** for companies on both sides.
- Aligning defence cooperation with

India's **Atmanirbhar Bharat** (self-reliance) vision.

- Moving forward, completing the **India-U.K. Free Trade Agreement (FTA)** and ensuring balanced gains will be key milestones in transforming this relationship into a robust long-term economic partnership.

Conclusion:

- The India-U.K. economic relationship today represents a **mature, confident, and forward-looking partnership** that prioritizes stability and shared prosperity over confrontation and rhetoric.
- By combining economic pragmatism, cultural cooperation, and educational exchange, both nations have shown how "quiet diplomacy" can achieve transformative results.

US-China Trade Frictions and Technological Rivalry: Implications for Global Geopolitics

Source: Indian Express

UPSC Relevance: **GS2 International Relations**

Context: **US-China Trade issues and global implications**

Why in News?

Two Chinese government agencies announced multiple export control measures related to rare earths, which are key industrial minerals whose processing is largely dominated by China

Introduction

- The 25th edition of *China This Week* highlights escalating tensions between the United States and China following

fresh rounds of tariff impositions and export control measures.

- The developments mark a renewed phase in the US-China trade rivalry, now centered around rare earths, semiconductors, and technological dominance.
- Simultaneously, diplomatic frictions extend to Europe, where the United Kingdom faces a political controversy linked to alleged Chinese espionage.
- Together, these developments underscore how China's economic and strategic maneuvers continue to reshape global geopolitics.



(Image Source: Outlook Business)

US-China Clash Over Rare Earths and Tariffs

Background

- Rare earth elements (REEs) are critical minerals used in manufacturing electric vehicles, smartphones, wind turbines, and defense systems. China currently controls nearly **60-70% of global rare earth production and over 80% of processing capacity**, giving it immense leverage in global supply chains.

Recent Developments

- On **October 9, 2025**, two Chinese government agencies announced **export control measures** targeting rare earth technologies and lithium battery-related materials.
- These restrictions were framed as

necessary to safeguard national security, but the timing and scope reflect a strategic response to US restrictions on Chinese access to advanced semiconductor technologies.

- In retaliation, **US President Donald Trump** declared a **100% tariff** on all Chinese goods effective **November 1, 2025**, and announced **export controls on critical software** — signaling a deepening of the technological decoupling between the world's two largest economies.

Chinese Perspective

- According to China's **state media (Xinhua)**, the United States has been "abusing the concept of national security" and "imposing unilateral discriminatory measures."
- Beijing justified the export curbs under the doctrine of "**dual-use regulation**", stating that Chinese rare earth materials were being diverted to **foreign military applications**, threatening its national interests.

Implications

- **Economic Impact:**
 - The rare earth restrictions could disrupt global industries, including electric vehicles, renewable energy, and defense manufacturing.
 - US and European firms heavily dependent on Chinese rare earth processing will face short-term supply shocks.
- **Strategic Leverage:**
 - Rare earths have historically been China's "strategic weapon" in trade negotiations, similar to how oil was used geopolitically in the 1970s.
 - By imposing export controls, China signals its readiness to use economic tools to counter Western technological restrictions.

Geopolitical Context:

- The timing precedes the **planned meeting between Trump and Xi Jinping** at the **Asia-Pacific Economic Cooperation (APEC)** summit in South Korea later this month.
- The measures are being viewed as bargaining chips for China to gain diplomatic leverage during negotiations.

Additions to the "Unreliable Entity List" and Qualcomm's Troubles

Background

- China maintains an "**Unreliable Entity List**" (**UEL**) — a countermeasure to the US's **Entity List**, which restricts Chinese firms like Huawei from accessing American technologies. The UEL targets foreign entities deemed to harm China's sovereignty, security, or development interests.

Recent Actions

- China's **Commerce Ministry** recently added **14 foreign organizations** to the UEL, many of which were **US-based**, accusing them of cooperating with Taiwan, making "malicious remarks about China," and aiding foreign efforts to suppress Chinese companies.
- In a parallel move, the **State Administration for Market Regulation (SAMR)** launched an **anti-monopoly investigation** into **Qualcomm**, the US semiconductor giant, over its **acquisition of Israel's Autotalks** without proper disclosure.
- This mirrors China's earlier **antitrust probe into Nvidia**, signaling a broader strategy to regulate and possibly restrain American tech giants operating within its jurisdiction.

Analysis

- **Economic Nationalism and Reciprocity:** China's regulatory actions reflect a **reciprocal response** to Western sanctions and technology bans. It uses market access as leverage in ongoing trade wars.
- **Impact on Global Supply Chains:**
 - Qualcomm derives **nearly 50% of its global revenue from China**, making the move economically significant.
 - As tensions escalate, Western companies may accelerate efforts to **"de-risk"** by shifting supply chains to Southeast Asia or India.
- **Strategic Significance:**
 - China's use of regulatory tools demonstrates the **fusion of economic policy with national security**.
 - It highlights Beijing's willingness to use domestic laws to push back against perceived geopolitical containment.

The UK Spy Controversy: Diplomacy Meets Domestic Politics

Overview

- The UK has recently witnessed political controversy over alleged Chinese espionage. Two men — **Christopher Cash**, a parliamentary researcher, and **Christopher Berry**, a teacher — were accused under the **Official Secrets Act** of gathering information prejudicial to Britain's national interests between 2021 and 2023.
- However, the charges were **dropped last month**, as the legal definition of "enemy" under the Act does not include China. The development reignited debate within British politics.

Political Fallout

- **Prime Minister Keir Starmer** blamed the previous Conservative government for failing to manage relations with China effectively.

- **Conservative MPs**, on the other hand, accused Starmer of going soft on Beijing to avoid diplomatic friction.
- The case rekindled older concerns about **Chinese interference in UK politics and universities**, and MI5's 2023 warning about a "sustained campaign of Chinese espionage on an epic scale."

Broader Context

- The controversy coincides with China's proposal to build a **20,000 sq. metre embassy complex in London**, which has faced opposition from local residents over security concerns.
- For the UK government, the issue underscores the **dilemma between economic engagement and national security vigilance** — a challenge also faced by other Western democracies.

Broader Implications for Global Geopolitics

- **Reassertion of Economic Sovereignty:** The recent developments show major powers reasserting control over **strategic supply chains** — from semiconductors to rare earths — reshaping global trade governance.
- **Technological Decoupling:** Both the US and China are now institutionalizing **"tech nationalism"**, marking the end of decades-long interdependence in high-tech sectors.
- **Fragmented Globalization:** The trade and regulatory clashes indicate a shift from **globalization to regionalization**, where alliances and security concerns increasingly define economic policies.
- **European Balancing Act:** The UK's espionage row and Europe's trade dilemmas highlight the region's struggle to **balance economic interests with security imperatives** in dealing with China.

Conclusion:

- Recent developments encapsulate the deepening structural contest between the United States and China — a contest not merely over trade but over **technological supremacy, resource control, and geopolitical influence**.

Economics Nobel 2025 for Innovation and Creative Destruction

Source: The Hindu

UPSC Relevance: GS 3 Economy

Context: creative destruction theory

Why in News?

THE 2025 ECONOMICS NOBEL WAS AWARDED TO JOEL MOKYR, PHILIPPE AGHION, AND PETER HOWITT FOR THEIR RESEARCH ON INNOVATION-DRIVEN ECONOMIC GROWTH AND CREATIVE DESTRUCTION.

Introduction

- Recently, the **Royal Swedish Academy of Sciences** awarded the **Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel** to **Joel Mokyr (US-Israel), Philippe Aghion (France), and Peter Howitt (Canada)** for their pioneering research on **innovation-driven economic growth**.

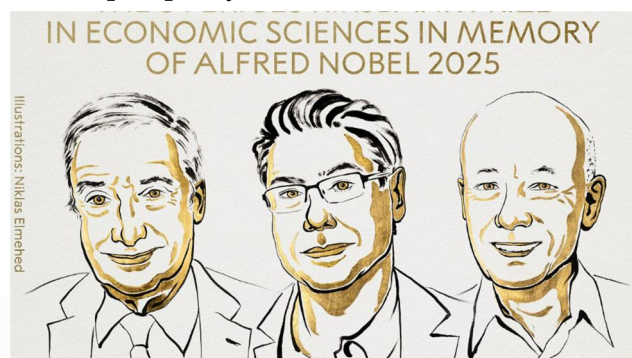
About the Laureates and Their Contributions

Name	Nationality	Contribution
Joel Mokyr	US-Israel	Identified prerequisites for sustained economic growth through technological progress using

		historical analysis.
Philippe Aghion	France	Developed theory of sustained growth via creative destruction . Co-authored 1992 model with Howitt.
Peter Howitt	Canada	Jointly developed mathematical model of creative destruction explaining how new innovations replace older technologies.

Key Points:

- Mokyr:** Focused on **historical patterns of innovation**, showing that economic growth is not automatic; sustained growth requires institutional, scientific, and technological preconditions.
- Aghion & Howitt:** Built **formal mathematical models** explaining how innovations generate **"creative destruction"**, a process where new products and technologies replace obsolete ones.
- Significance:** Their research **quantifies and explains the mechanisms behind long-term economic growth**, reinforcing the principle that innovation is central to prosperity.



(Image Source: Indian Express)

Conceptual Framework: Creative

Destruction

- Coined by **Joseph Schumpeter (1942)** in *Capitalism, Socialism and Democracy*.
- Definition: The process by which **new innovations replace older technologies**, making some firms obsolete while driving overall economic growth.
- Modern Relevance: Explains **technological revolutions**, shifts in industry dominance, and the need for **policy support for innovation**.
- Example:** Electric vehicles replacing internal combustion engines; digital platforms replacing traditional retail.

Policy and Economic Implications

- Innovation is **not automatic**; it depends on **research, investment, institutions, and education**.
- Protectionism and trade wars, as highlighted by Aghion, **impede global growth and innovation**.
- Policymakers can draw on this research to design:
 - R&D incentives
 - Support for startups and tech adoption
 - Educational programs for innovation-oriented skills
- Global Relevance:** The study reinforces that **economic growth is sustainable only when systems support continuous innovation**, applicable to both developed and developing economies.

Historical Context and Nobel Significance

- Economics Nobel formally established in **1968 by Sweden's central bank**, not originally part of Alfred Nobel's will.
- Presented alongside Nobel Prizes in **December**, includes:
 - Gold medal
 - Diploma

- \$1.2 million prize

- Previous Nobel 2024 winners (**Acemoglu, Johnson, Robinson**) studied **why some countries are rich and others poor**, showing continuity in focus on **growth and development mechanisms**.

Lessons for India and Global Economy

- India's **startup ecosystem, digital economy, and technology policies** can be analyzed through the lens of creative destruction.
- Innovation-driven policies ensure **long-term competitiveness**, avoiding stagnation in manufacturing, agriculture, or services.
- Encourages **investment in AI, renewable energy, and green technologies** as growth engines.
- Quote by Nobel Committee Chair:** "Economic growth cannot be taken for granted. We must uphold the mechanisms that underlie creative destruction, so that we do not fall back into stagnation."

Conclusion:

- The 2025 Economics Nobel highlights that **innovation is the engine of economic growth**, but it is **fragile** without **supportive institutions and policies**.

Afghanistan-Pakistan conflict and its Implications for India

Source: Indian Express

UPSC Relevance: GS2 International Relations

Context: Afghanistan-Pakistan conflict

Why in News?

The Afghanistan-Pakistan conflict stems from historical, ethnic, and strategic issues, making it

crucial for India to monitor, engage, and ensure regional stability.

Introduction

- The recent escalation in tensions between Afghanistan and Pakistan has highlighted the fragile security dynamics of South Asia.
- During Afghanistan's Foreign Minister and Taliban leader **Amir Khan Muttaqi's visit to India**, clashes erupted between Pakistani and Afghan forces along the **Durand Line**, involving cross-border airstrikes, military post captures, and casualties on both sides.
- While New Delhi naturally views developments through the lens of bilateral India-Pakistan relations, the conflict reflects deeper historical, cultural, and geopolitical complexities that extend beyond India's immediate concerns.

Historical Context

Partition Legacy

- The **Durand Line**, demarcated in 1893 by the British, divides the Pashtun population between Afghanistan and Pakistan.
- Afghanistan has **never fully recognized the Durand Line**, leading to persistent border disputes.
- Pakistan fears the idea of a **Pashtunistan** – a potential autonomous homeland for Pashtuns – which influences its border policies.

Post-2021 Scenario

- The **U.S. withdrawal from Afghanistan in August 2021** allowed the Taliban to return to power.
- Pakistan viewed this as a chance to regain "**strategic depth**" in Afghanistan, hoping for influence over Kabul.

- However, unresolved historical issues resurfaced, including Afghan resentment over Pakistan's perceived interference and its sheltering of anti-Pakistan groups like the **Tehreek-e-Taliban Pakistan (TTP)**.

Current Conflict Dynamics

Immediate Trigger

- Pakistan carried out **airstrikes inside Afghan territory**.
- Afghanistan retaliated by **capturing military posts across the Durand Line**, escalating tensions.
- Both sides suffered **casualties** among security personnel.

Underlying Causes

- **Security concerns:** Pakistan accuses the Taliban of harboring **terrorists targeting Pakistan**.
- **Ethnic and political tensions:** Afghanistan resents being treated as a **puppet of Rawalpindi/Islamabad**.
- **Domestic unrest in Pakistan:** Movements like **Pashtun Tahafuz Movement (PTM)** seeking rights and autonomy have been sidelined by the military establishment.



(Image Source: DW)

Implications for India

Regional Security

- Instability in Afghanistan-Pakistan relations affects **cross-border terrorism**, narcotics trade, and refugee flows.

- India's strategic investments in Afghanistan's infrastructure and diplomacy could be affected.

Diplomatic Leverage

- India can use its relationship with Afghanistan to counter Pakistan's influence in Kabul.
- Ensuring a stable Afghanistan aligns with India's long-term interests in South Asian security and connectivity projects.

Strategic Caution

- India must balance support for Afghan sovereignty with caution to avoid direct confrontation with Pakistan.
- Monitoring developments at the Durand Line is crucial for intelligence and defense preparedness.

Conclusion:

- The Afghanistan-Pakistan conflict is more than a bilateral dispute; it is rooted in historical grievances, ethnic politics, and strategic calculations. For India, it is imperative to closely observe developments, strengthen ties with Afghanistan, and prepare for potential spillover effects, while advocating for peaceful resolution and respect for sovereignty.

Gaza Ceasefire Declaration and Israel-Hamas Hostage Exchange

Source: The Hindu

UPSC Relevance: GS2 International Relations

Context: Gaza Ceasefire declaration

Why in News?

In October 2025, the US, Egypt, Qatar, and Turkiye mediated the Gaza Declaration, ending over two years of Israel-Hamas conflict with a ceasefire, hostage release, and prisoner exchange.

Background

- The Gaza conflict escalated on **October 7, 2023**, when **Hamas militants** launched an attack on Israel, taking **251 hostages** and resulting in the deaths of **1,219 people**, mostly civilians.
- Over the following two years, intermittent truces led to the release of most hostages, but **47 remained captive**, keeping the humanitarian crisis alive.
- The prolonged conflict caused extensive **civilian casualties**, **destruction of infrastructure**, and deepened regional instability in West Asia (Middle East). International actors, particularly the **US, Egypt, Qatar, and Turkiye**, stepped in to mediate a **permanent ceasefire**.

The Declaration

- On **October 13, 2025**, in **Sharm el-Sheikh, Egypt**, a landmark ceasefire agreement—referred to as the **Gaza Declaration**—was signed by the **US President Donald Trump** along with leaders of **Egypt, Qatar, and Turkiye** as guarantors.

Key Provisions:

Hostage and Prisoner Exchange

- Hamas released the last 20 surviving **hostages** after two years of captivity.
- Israel released **1,968 prisoners**, predominantly Palestinians, including **250 security detainees** convicted of killing Israelis.
- Hamas agreed to return the **bodies of 27 hostages** who died or were killed in captivity, along with remains of a soldier from the **2014 Gaza conflict**.
- Israel noted that not all deceased hostages were expected to be returned immediately.

Declaration as a Ceasefire Guarantee

- The **US, Egypt, Qatar, and Turkiye** acted as **guarantors** of the agreement.
- The document outlined rules, regulations, and enforcement mechanisms for the ceasefire.
- Trump expressed confidence that the declaration would “hold up” and prevent resumption of hostilities.

Diplomatic Engagements

- Trump praised **Egyptian President Abdel Fattah El-Sisi** for his instrumental role in mediating with Hamas.
- Trump also met **Palestinian President Mahmoud Abbas** to discuss next steps, though representatives from Israel and Hamas were absent.
- Talks on **phase-wise implementation** of post-ceasefire plans began, aiming to stabilize Gaza and prevent future escalations.



(Image Source: The Hindu)

Key Challenges

- **Hamas's Refusal to Disarm:** The group has not agreed to fully relinquish its arms, a critical issue for long-term peace.
- **Israel's Incomplete Withdrawal:** Israel has not committed to a full withdrawal from Gaza, leaving territorial and security concerns unresolved.
- **Complex Phased Implementation:** Multiple phases, including humanitarian aid, reconstruction, and political negotiations, need careful coordination.

Significance

- Marks a **major diplomatic breakthrough** in ending a two-year conflict.
- Demonstrates the role of **multilateral mediation** in West Asia peacebuilding.
- Offers **humanitarian relief**, including the return of hostages and potential reconstruction of Gaza.
- Could serve as a **precedent for conflict resolution** between Israel and other Palestinian factions.

Implications of Gaza Declaration for India

1. Strategic and Diplomatic Implications

- **Enhanced India-West Asia Engagement:**
 - India has strong diplomatic ties with both Israel and the Arab world (including UAE, Qatar, and Egypt).
 - The ceasefire creates opportunities for India to **strengthen its diplomatic influence** as a neutral actor advocating peace.
- **Support for Multilateral Mediation:**
 - The US-led mediation with regional guarantors showcases a **model of conflict resolution** India can reference in its West Asia policy, particularly in forums like **UN, OIC, and G20**.
- **Regional Stability:**
 - Reduction in hostilities in Gaza may **stabilize West Asia**, crucial for India given its **energy imports (~50% of crude oil)** from the region.
 - Decreased tensions reduce the risk of **terrorist spillovers** that could affect Indian interests in Israel, the Gulf, and beyond.

2. Economic Implications

- **Energy Security:**
 - Stable relations in West Asia reduce

the risk of disruptions in oil and gas supply, supporting India's **energy import security**.

- **Trade and Investments:**

- Stability in Israel, Gaza, and neighboring Arab countries could **encourage Indian investments** in infrastructure, technology, and renewable energy projects.
- Indian businesses involved in **construction, defense, and IT services** may find safer operational environments.

3. Humanitarian and Diaspora Considerations

- **Protection of Indian Nationals:**

- India has a **large diaspora in West Asia**, especially in Gulf countries and conflict zones.
- Ceasefire reduces risks to Indian expatriates living in or near Gaza, Israel, and surrounding countries.

- **Humanitarian Diplomacy:**

- India can contribute **aid, reconstruction support, and peacebuilding initiatives**, enhancing its **soft power** and international standing.

4. Security Implications

- **Counterterrorism and Intelligence Sharing:**

- Stable West Asia allows India to **coordinate better on intelligence sharing** related to regional terrorist networks.
- Reduces the likelihood of **conflict-induced radicalization** affecting Indian security interests.

- **Strategic Partnerships:**

- India's collaboration with Israel (defense, technology) can **continue unimpeded**, while maintaining relations with Arab countries.

- Balances India's **"multi-alignment" foreign policy** approach in West Asia.

5. Geopolitical Significance

- **India as a Neutral Mediator:**

- By supporting peace initiatives in West Asia without taking sides, India strengthens its **image as a responsible global actor**.
- Positions India for a **bigger role in future multilateral conflict resolution** frameworks.

- **Energy and Security Corridor:**

- Stability enhances the prospects of projects like **India-Gulf energy partnerships** and ensures safe maritime corridors in the Arabian Sea and Red Sea regions.

Sawalkote Project: Balancing Strategy and Sustainability

Source: The Hindu

UPSC Relevance: GS2 International Relations

Context: Indus Water Treaty

Why in News?

The Sawalkote Hydroelectric Project on the Chenab highlights the tension between India's strategic assertion over western rivers post-IWT suspension

Introduction

- The Sawalkote Hydroelectric Project, a 1.8-GW scheme planned on the Chenab River, has recently gained fresh momentum following India's unilateral suspension of the **Indus Waters Treaty (IWT)** in the aftermath of the Pahalgam attack.
- This move has given the project a strong geopolitical significance, overshadowing

crucial environmental and social considerations. The project exemplifies the complex balance India faces between **national security imperatives, ecological responsibility, and regional diplomacy.**

Strategic Significance:

Geopolitical Signaling:

- The timing of Sawalkote reflects India's intent to operationalise its water rights over western rivers following the IWT suspension.
- By removing treaty constraints, India has enabled projects such as Sawalkote and the Wullar Barrage to advance without procedural delays.
- This underscores India's strategic posture in asserting control over riverine resources in Jammu & Kashmir.

Risks to Diplomatic Credibility:

- Unilateral suspension of the IWT could erode India's credibility as a **rule-abiding riparian state** in international forums.
- Pakistan has already challenged the legality of India's suspension under the 1960 treaty framework.
- Moving forward without cooperative mechanisms may invite **third-party scrutiny**, potentially complicating future negotiations.

Indus Waters Treaty (IWT), 1960

- The IWT is a **water-sharing agreement** between **India and Pakistan**, brokered by the **World Bank** (then International Bank for Reconstruction and Development) and signed in **1960**.
- It was formulated in the context of the **partition of India (1947)**, which divided the **Indus River system** between the two countries.

- The treaty ensures **peaceful cooperation over shared rivers**, despite political tensions.

Rivers Covered: The treaty divides the **six major rivers of the Indus Basin** as follows:

River Type	Allocation
Eastern Rivers (Ravi, Beas, Sutlej)	India has exclusive use for irrigation, hydro, and domestic purposes. Pakistan receives limited flow rights .
Western Rivers (Indus, Jhelum, Chenab)	Pakistan has exclusive use. India can use water for non-consumptive purposes like hydroelectric projects, canals, and limited storage.

Environmental and Social Concerns:

Hydrological and Ecological Stress:

- The Chenab already hosts a **"bumper-to-bumper"** hydropower corridor with projects like **Dulhasti, Baglihar, and Salal**.
- Ignoring cumulative impacts risks **compounded sediment loads and slope instability**, critical issues in fragile Himalayan ecosystems.



(Image Source: News Arena)

Dam Characteristics and Environmental Impact:

- Although Sawalkote is termed a **run-of-river** project, the proposed gravity dam will form a reservoir of over **50,000 crore litres**, functionally closer to a **storage dam**.

- Forest diversion: 847 hectares of forest land will be affected.
- Human displacement: Nearly 1,500 families will be resettled, yet rehabilitation costs account for only 0.6% of total expenditure.

Financial and Administrative Challenges:

- The project cost has escalated by ₹9,000 crore due to **inflation and prolonged administrative uncertainty**.
- NHPC Limited's historical record in Himalayan projects indicates **schedule slippages and cost overruns**, highlighting governance and project management challenges.

Balancing Strategy and Stewardship:

National Security vs. Ecological Responsibility:

- Strategic assertion of water rights should not come at the expense of ecological sustainability.
- Hydrological and sediment management studies should be **institutionalised and regional in scope**, ensuring that cumulative environmental impacts are accounted for in all future projects.

Data Transparency and Confidence-Building:

- Institutionalising **hydrological monitoring** through regional or multilateral platforms can convert potential security risks into confidence-building measures.
- This approach aligns **strategic autonomy with environmental stewardship**, demonstrating responsible governance in transboundary water management.

Implications on India-Pakistan Relations

1. Strain on Bilateral Water Cooperation:

- The **Indus Waters Treaty (IWT)**, 1960, has historically governed water sharing between India and Pakistan.

- India's **unilateral suspension of the IWT** in the wake of the Pahalgam attack removes treaty constraints for projects like Sawalkote.
- This may **erode trust**, making Pakistan wary of India's intentions on western rivers.

2. Legal and Diplomatic Challenges:

- Pakistan has already **challenged the suspension's legality** under the 1960 treaty framework.
- Moving forward with multiple large projects without consultation may invite **third-party or international arbitration**, which India has traditionally avoided.

3. Geopolitical Signaling and Strategic Assertion:

- India's operationalisation of hydro projects like Sawalkote signals **assertion of control over water resources** in Jammu & Kashmir.
- While this strengthens India's strategic autonomy, it is perceived by Pakistan as a **provocative action**, potentially heightening bilateral tensions.

4. Potential for Conflict and Retaliation:

- Water infrastructure on transboundary rivers is **highly sensitive**; Pakistan may respond with legal, diplomatic, or even strategic countermeasures.
- Uncoordinated projects could exacerbate **water security concerns** in Pakistan, influencing the broader regional security environment.

5. Impact on Regional Diplomacy and Cooperation:

- India's credibility as a **rule-abiding riparian state** could be questioned in multilateral fora where it advocates rule-based governance.

- Lack of cooperative mechanisms may reduce **scope for confidence-building measures** in the Indus basin, affecting long-term water diplomacy.

6. Long-Term Opportunities:

- If India pairs strategic hydro development with **transparency, regional data-sharing, and environmental stewardship**, it could **convert potential friction into confidence-building**.
- Properly managed, hydrological cooperation could eventually support **peaceful co-existence and sustainable development** in the Indus basin.

Conclusion:

- The legacy of the Sawalkote Hydroelectric Project will depend on whether India can successfully **integrate national security imperatives with ecological responsibility**.
- The key takeaway is that **national security and ecological responsibility are not mutually exclusive; they reinforce each other when governance is visionary and inclusive**.

Powering up the Australia-India Clean Energy Partnership

Source: Indian Express

UPSC Relevance: GS2 International Relations

Context: Australia-India Clean Energy

Why in News?

Australia and India are strengthening their Renewable Energy Partnership (REP) to develop resilient clean energy supply chains.

Introduction

- At a time when both **India and Australia** are pursuing ambitious clean energy goals, Australian Climate Change and Energy Minister **Chris Bowen's visit to New Delhi (October 2025)** marks an important step in advancing the **India-Australia Renewable Energy Partnership (REP)** — a framework launched by Prime Ministers **Narendra Modi** and **Anthony Albanese** in 2024 to strengthen cooperation in the renewable energy sector.
- The visit takes place amid **growing vulnerabilities in global supply chains**, dominated by **China's control over critical minerals and renewable components**, prompting both nations to seek diversified, resilient, and regionally anchored clean energy ecosystems.

The Clean Energy Imperative in the Indo-Pacific

- **Climate Vulnerability of the Region**
 - The **Indo-Pacific** is among the most **climate-vulnerable regions** in the world.
 - Between **1970 and 2022**, it witnessed **nearly 10 climate-related disasters every month**, resulting in large-scale fatalities and economic losses.
 - Projections indicate that by **2050**, around **89 million people** could be displaced, with **80% of the population** directly affected by climate impacts.
- **India's Climate Commitments**
 - India has pledged to achieve **500 GW of non-fossil electricity capacity by 2030**, with **280 GW** expected from solar energy.
 - As of **July 2025**, India achieved a key milestone — **50% of its installed**

capacity now comes from **non-fossil sources**, **five years ahead of schedule**.

- These achievements align with India's **Panchamrit goals** announced at **COP26**, reinforcing its leadership in renewable energy adoption.
- **Australia's Commitments**
 - Australia has set a **62-70% reduction in emissions (below 2005 levels)** by **2035**, aligning with its **net-zero target for 2050**.
 - Its government describes these goals as "**ambitious, achievable, and investable**," emphasizing private sector participation and green investments.



(Image Source: The Hindu)

The Central Challenge – Dependence on China

- **Dominance of China in Clean Energy Supply Chains**
 - **China refines over 90%** of the world's **rare earth elements** and produces **nearly 80%** of global **solar modules**.
 - This concentration poses **systemic risks** to global energy transitions, exposing countries to **supply shocks** and **geopolitical leverage**.
- **India's Dependence**
 - India faces acute vulnerability in **electric mobility and wind energy**, heavily relying on **imports of rare**

earth magnets, lithium, and battery materials from China.

- Any disruption affects India's **EV manufacturing and renewable projects** – as seen during the **COVID-19 pandemic**, when supply shortages slowed down domestic EV production.
- **Australia's Vulnerability**
 - While **Australia** is a leading **exporter of lithium, cobalt, and rare earths**, it lacks **refining and downstream manufacturing capacity**.
 - This makes Australia a **raw-material supplier** without full control over the **value chain**, exposing it to market volatility and missed industrial opportunities.

The Renewable Energy Partnership (REP): Framework for Cooperation

- The **India-Australia Renewable Energy Partnership**, launched in **2024**, provides a **structured roadmap** for collaboration. It outlines cooperation across **eight key areas**:
 - Solar photovoltaic (PV) technology development and manufacturing.
 - Green hydrogen production and infrastructure.
 - Energy storage solutions, including advanced battery technologies.
 - Solar supply chain diversification to reduce dependence on single-country sources.
 - Circular economy practices in renewable materials recycling.
 - Two-way investment promotion for clean energy projects.
 - Capacity building and skill development, leveraging India's workforce.
 - Other shared priorities, including policy harmonization and research

exchanges.

- The partnership also includes a **Track 1.5 Dialogue**, which brings together **policymakers, industry, and research institutions** to facilitate **joint projects, R&D collaboration, and investment planning**.

Complementary Strengths: India and Australia

Australia's Strengths

- **Abundant critical minerals** such as lithium, nickel, and cobalt.
- **Stable regulatory environment** and transparent governance systems.
- Experience in **green technology innovation** and **climate financing**.
- The **Net Zero Jobs Plan** aims to build a skilled green workforce — aligning with India's expertise in training and human resource development.

India's Strengths

- **Large and youthful workforce** (nearly two-thirds under 35 years).
- **Government schemes** like **Skill India** and **PLI (Production Linked Incentives)** for solar, batteries, and green hydrogen.
- Rapidly growing domestic market for renewable technologies.
- Manufacturing capacity and cost competitiveness, allowing scaling of affordable clean technologies.

Mutual Benefits

- **Australia's resources + India's workforce = complementary partnership.**
- Co-investment in refining, processing, and technology transfer will enable both nations to control larger parts of the clean energy value chain.
- Joint R&D in hydrogen, storage, and solar innovation could position the partnership as a regional model for clean

energy cooperation.

Geostrategic and Economic Implications

- **Reducing Dependence on China**
- The partnership supports **supply chain diversification**, enhancing **strategic autonomy** for both countries.
- It aligns with broader regional efforts like the **Quad's clean energy initiative**, emphasizing **resilient technology ecosystems** in the Indo-Pacific.

Regional Leadership and Climate Diplomacy

- India and Australia can demonstrate how **two democracies** in the Indo-Pacific can jointly address **climate threats** through **sustainable cooperation**.
- The partnership could become a template for South-South collaboration, combining resource-rich and demography-rich nations for mutual gains.
- Investment and Employment Opportunities
- Cross-investment in green hydrogen hubs, solar parks, and battery plants can generate thousands of jobs in both nations.
- India could emerge as a hub for clean energy manufacturing, while Australia gains from value addition to its mineral exports.

Way Forward

To make the **Renewable Energy Partnership (REP)** impactful, both countries should:

- **Establish joint venture projects** in solar module manufacturing, hydrogen production, and rare-earth refining.
- **Create an Indo-Pacific Clean Energy Fund** to mobilize public and private investment.
- Enhance technology sharing agreements, particularly in battery recycling, grid

integration, and carbon capture.

- Expand academic and technical exchanges to build a skilled workforce through India-Australia Green Skills Initiatives.
- Institutionalize Track 1.5 dialogues to ensure regular review and implementation of REP goals.

Conclusion:

- Australia and India stand at a strategic juncture in their energy transition journeys. While Australia offers the minerals and capital, India contributes the scale, labor, and manufacturing expertise. Together, they can build a diversified, resilient, and sustainable clean energy ecosystem for the Indo-Pacific region.

Madagascar Military Coup After Presidential Impeachment

Source: The Hindu

UPSC Relevance: GS2 International Relations

Context: Madagascar Military Coup

Why in News?

Recently, Madagascar's elite military unit CAPSAT seized power following the impeachment of President Andry Rajoelina amid nationwide protests over governance failures and service outages.

Background

- Madagascar plunged into political turmoil after an **elite military unit**, CAPSAT, seized power following the **impeachment of President Andry Rajoelina** by the National Assembly.
- The crisis marks a significant moment in the island nation's fragile democracy,

combining **mass youth-led protests**, **constitutional disputes**, and **military intervention**.

Constitutional and Legal Dimensions

- The situation presents a **duality of claims to authority**:
- **Rajoelina's Decree vs. Parliament's Vote**: The president attempted to **dissolve the legislature** to prevent his impeachment, while lawmakers proceeded regardless, invoking their **constitutional right to impeach**.
- **Role of the High Constitutional Court**: Under Madagascar's Constitution, the **High Constitutional Court** must validate an impeachment vote for it to take effect. However, with the military takeover, **constitutional procedures have been effectively suspended**.
- **Nature of the Takeover**: CAPSAT's intervention constitutes a **military coup**, disrupting the constitutional order and replacing an elected government with an **unelected military committee** – an act widely condemned under international democratic norms.

Causes of the Political Crisis

Immediate Triggers

- Nationwide **power and water shortages** causing public hardship.
- Growing **youth unemployment** and inflation.
- Allegations of **corruption and authoritarian governance**.
- **Use of force against protesters**, leading to public outrage.

Deep Structural Causes

- **Weak institutional capacity** and lack of checks and balances.
- **Political factionalism** within the armed forces.

- **History of coups** (notably in 2009, when Rajoelina himself came to power through a similar military-backed transition).
- **Widespread poverty** and governance deficits exacerbating social unrest.

Role of the Military and CAPSAT

- The **CAPSAT unit**, which played a **central role in the 2009 coup**, again emerged as a decisive actor.
- Its defection shifted the balance of power in Antananarivo, leaving Rajoelina without reliable security backing.
- The unit justified its takeover as acting on behalf of the people, promising a **temporary transitional council** and eventual **return to civilian rule**. However, **historical precedents suggest prolonged military control** often follows such promises.



(Image Source; The Hindu)

Domestic Implications

- **Political Vacuum:** Power now lies with an ad-hoc military committee lacking constitutional legitimacy.
- **Governance Breakdown:** Ministries, courts, and public services are operating irregularly amid the power transition.
- **Economic Fallout:** Investor confidence has plummeted, aid flows are threatened, and the local currency has weakened.
- **Civil Unrest:** Demonstrations continue, raising fears of **violence and**

humanitarian instability.

International and Regional Reactions

- **African Union (AU):** Likely to **suspend Madagascar's membership**, as it did during previous coups, until constitutional order is restored.
- **United Nations and Western Partners:** Expected to condemn the coup, freeze non-humanitarian aid, and urge dialogue and elections.
- **Regional Neighbours:** Members of the Southern African Development Community (SADC) may seek to mediate, as they did during earlier Malagasy crises.

Possible Scenarios Ahead

- **Managed Transition:** The military establishes a short-term transitional authority with a clear election timetable – the **most desirable** but least certain outcome.
- **Prolonged Military Rule:** The committee consolidates control, delaying a return to democracy and suppressing dissent.
- **Violent Power Struggle:** Rival factions within the security forces clash, leading to instability or potential civil conflict.

Policy Implications and Way Forward

- **For Madagascar:**
 - Immediate restoration of law and order.
 - Judicial resolution of the impeachment dispute through the **High Constitutional Court**.
 - Guarantee of fundamental rights and media freedom.
 - Formulation of a credible **roadmap to elections**.
- **For International Community:**
 - Pressure for a **civilian-led transition** through AU and SADC mediation.

- Targeted sanctions against coup leaders while maintaining humanitarian aid.
- Support for institutional reforms and capacity-building to prevent future crises.

China's K Visa as an Emerging Alternative to the U.S. H1B for Global STEM Talent

Source: The Hindu

UPSC Relevance: GS2 International Relations

Context: New Visa type of China and implications on India

Why in News?

China has launched the K Visa to attract young global STEM talent, offering an alternative to the U.S. H1B visa amid growing protectionism and visa restrictions in the U.S.

Introduction

- China's newly introduced **K Visa** represents a major shift in its immigration and talent recruitment policy.
- Unlike previous visas that required **employer sponsorship**, the K visa aims to attract **independent researchers, innovators, and entrepreneurs** in science, technology, engineering, and mathematics (STEM) fields.
- This move is seen as a **strategic response** to global talent wars, particularly the tightening of the **U.S. H1B visa regime**, which has historically drawn large numbers of Indian professionals.

What is the K Visa?

- The **K Visa** is China's latest work-and-research visa category designed to **invite young foreign STEM graduates and**

professionals to live and work in China.

- It **removes the requirement of employer sponsorship**, previously a major entry barrier for foreign professionals.
- The visa allows **independent innovators** to pursue research or start-ups in China's growing high-tech ecosystem.
- **Key Difference from Previous Chinese Visas**

Visa Type	Target Group	Requirement	Purpose
R Visa	High-level foreign experts and specialists urgently needed by the State	Employer sponsorship mandatory	To "import talent" for government-backed projects
K Visa	Young STEM researchers, innovators, and entrepreneurs	No employer sponsorship required	To promote independent innovation and attract global STEM talent

Strategic Objectives Behind the K Visa

a) Economic Transformation

- Aligned with President Xi Jinping's slogan of "**New Quality Productive Forces**", the K visa supports China's transition from a **labour-intensive** economy to a **knowledge-driven, innovation-based** one.
- It seeks to **boost productivity** through domestic research and development (R&D).

b) Technological Self-Reliance

- The visa supports China's ambition to

lead in advanced technologies – including AI, quantum computing, semiconductor design, green energy, and biotechnology.

- It complements initiatives like the **Thousand Talents Programme**, aimed at attracting global experts and overseas Chinese researchers.

c) Geopolitical Timing

- The K Visa was announced **weeks before the U.S. increased H1B visa fees by \$100,000**, predominantly impacting Indian STEM workers.
- This timing reflects a **strategic move** to position China as an **alternative destination for global talent**, especially from India.

d) Responding to Global Technological Decoupling

- Amid the **U.S.-China trade wars and tech decoupling**, the visa reinforces China's goal of **scientific and technological independence** while maintaining a "Chinese character" in innovation.

Opportunities and Incentives for Indian STEM Graduates

a) Major Attractions

- **No employer sponsorship** – allows flexibility for entrepreneurs and independent researchers.
- **Lower cost of living** compared to the U.S. and **strong research infrastructure**.
- **Safety (no gun violence)** and rapidly expanding innovation clusters in cities like Beijing, Shanghai, and Shenzhen.

b) Growing Indian STEM Migration

- Despite geopolitical tensions, many Indian professionals and students view China as a **viable and pragmatic destination**.
- China currently employs around **4-6%**

of global STEM talent but aims to significantly increase this share.

- China needs **700,000 engineers for its semiconductor industry by 2026**, but currently has only about **450,000**, indicating a large talent gap.



(Image Source: HR News)

Challenges and Limitations

a) **Screening and Regulation:** Without institutional sponsorship, the **entire verification process** falls on the government, raising concerns about transparency and fairness.

b) **Language and Cultural Barriers:** **Mandarin proficiency** remains a major hurdle for most foreign applicants.

Limited understanding of Chinese workplace culture may deter some professionals.

c) **Immigration Strictness:** China's **tight border control and security regulations** mean entry barriers are still significant despite relaxed sponsorship rules.

d) **Lack of Research Freedom:** Experts highlight uncertainty around **academic freedom, data access, and long-term residency**—factors that influence foreign researchers' willingness to relocate.

Domestic Backlash and Controversy

The K Visa has sparked **strong debate within China**, primarily over its **timing amid youth unemployment and rising nationalism**.

a) Public Concerns

- Many young Chinese citizens fear

foreign professionals might replace domestic talent, especially when youth unemployment (ages 16–40) is estimated to be 16–40%, despite an official figure of 5%.

- Online criticism includes **xenophobic and nationalist tones**, particularly towards Indian STEM workers.

b) Government Response

- Chinese state media clarified that “**Chineseness will not be erased from innovation**” and that the visa is meant to **fill genuine talent gaps**, not displace locals.
- Visa approvals remain **stringent**, ensuring only **credible innovators** are selected.

Broader Implications for India and Global Talent Flows

a) For India

- The K visa may **divert a segment of Indian STEM talent** from the U.S. to China, especially those seeking research autonomy.
- However, concerns about **academic freedom and political control** may limit large-scale migration.

b) For Global Competition

- The move intensifies **Asia’s intra-regional competition** for skilled migrants — with **Japan, South Korea, and Singapore** already reforming visa policies.
- It underscores the emergence of **China as a challenger** in the global race for innovation leadership.

Conclusion:

- China’s K Visa represents both an **economic necessity and a geopolitical strategy**. It aims to **attract foreign STEM**

professionals, reduce dependence on Western innovation ecosystems, and boost China’s domestic research capabilities.

Pakistan and Afghanistan Agree to Immediate Ceasefire During Qatar-Mediated Talks

Source: The Hindu

UPSC Relevance: GS 2 – International Relations (India and its Neighbourhood; Security and Regional Stability)

Context: Doha based Pak-Afghan peace talks

Why in News?

After over a week of deadly cross-border clashes that killed dozens and displaced hundreds, Pakistan and Afghanistan agreed to an immediate ceasefire during Doha-based peace talks mediated by Qatar and Türkiye on October 19 2025.



(Image Source: India Today)

Background

The Pakistan–Afghanistan border, running 2,611 km along the **Durand Line**, has long been volatile. Both sides accuse each other of harbouring militant groups.

- In recent weeks, Pakistan conducted **airstrikes inside Afghanistan’s Paktika province**, targeting the *Hafiz Gul Bahadur* militant group following a suicide bombing in Pakistan’s Khyber

Pakhtunkhwa. Afghanistan alleged the raids killed civilians, including sportspersons, triggering public outrage and a cricket-series boycott.

- The Doha meeting, attended by both countries' **Defence Ministers**, aimed to restore peace and establish mechanisms to prevent further hostilities.

Key Outcomes of the Qatar-Mediated Talks

- **Immediate Ceasefire:** Both nations agreed to stop hostilities and avoid retaliatory actions.
- **Peace Mechanisms:** A joint committee will be set up to ensure ceasefire implementation and monitor border incidents.
- **Follow-Up Talks:** Future meetings are planned in Doha to consolidate the ceasefire and build long-term confidence.
- **Regional Mediation:** Qatar and Turkiye acted as principal facilitators, while **Saudi Arabia** expressed diplomatic support for peace efforts.

Broader Regional Context

- The clashes occurred amid **rising militant activity** in Pakistan's tribal belt and increasing instability in Afghanistan following the Taliban's return to power in 2021.
- Groups such as the **Islamic State-Khorasan (IS-K)** and **al-Qaida affiliates** are reportedly trying to regain strength, threatening cross-border security.
- The ceasefire aims to prevent escalation that could spill over into Central and South Asia.

India Impact and Strategic Significance

1. Regional Stability and Security:

- A stable Pakistan-Afghanistan border reduces the risk of militant infiltration into South Asia and contributes to broader regional security.
- India, as a major regional stakeholder, benefits from reduced volatility that could otherwise aid extremist mobility across the Hindu Kush corridor.

2. Counter-Terrorism Cooperation:

- Pakistan's focus on its western front may temporarily lower tensions along its eastern frontier with India, but intelligence agencies will watch for any **redeployment of militant networks**.
- India's diplomatic messaging can emphasize **counter-terrorism cooperation under multilateral frameworks** like SCO and UN CTC.

3. Economic and Connectivity Dimensions:

- Peace in the Af-Pak region facilitates prospects for **India-Iran-Afghanistan connectivity** through Chabahar and the **International North-South Transport Corridor (INSTC)**.
- It may also revive discussions on **regional trade routes** bypassing Pakistan, should stability hold.

4. Geopolitical Significance:

- Qatar's active mediation underscores West Asia's growing diplomatic role in South-Central Asian conflicts, aligning with India's interest in **multipolar, dialogue-based regional security frameworks**.
- India can engage constructively through back-channel diplomacy with Doha, maintaining strategic balance

amid U.S. withdrawal and Chinese influence in the region.

Challenges Ahead

- **Fragile Trust:** The history of ceasefire violations along the Durand Line undermines confidence.
- **Militant Sanctuaries:** Pakistan demands that the Taliban curb cross-border terrorism, but enforcement capacity remains uncertain.
- **Civilian Impact:** Humanitarian fallout and displacement may continue unless local governance and aid delivery improve.

Conclusion:

The Qatar-mediated ceasefire marks a temporary but vital pause in escalating Af-Pak hostilities. Its sustainability depends on verifiable border management, dismantling of militant sanctuaries, and regional cooperation. For India, it signals a cautiously positive shift in South Asia's security landscape—offering diplomatic space to strengthen regional peace and connectivity initiatives.

FAO Celebrates 80 Years of Partnership with India on World Food Day 2025

Source: Press Information Bureau (PIB)

UPSC Relevance: GS Paper 2 - International Relations (India-UN Agencies), GS Paper 3 - Agriculture, Food Security

Context: Agriculture and food security

Why in News

On World Food Day 2025, India and the Food and Agriculture Organization (FAO) celebrated 80 years of partnership, highlighting India's transformation from a food-deficient nation at Independence to a food-secure and surplus

producer.

Key Highlights of the Event

- **Historic Milestone:** India is a founding member of FAO (since 1945), and the 80-year partnership has played a central role in India's agricultural transformation through technical collaboration, research, and innovation.
- **FAO's Support:** FAO's assistance has helped India modernize crop systems, diversify production, and promote climate-resilient, nutrition-sensitive farming.
- **India's Achievement:**
 - Despite having less than 4% of the world's agricultural land and freshwater, India has achieved self-sufficiency in food grains.



- Public stockholding, Minimum Support Price (MSP), and the National Food Security Act (NFSA) ensure affordable food access for over 800 million people.

Image Source: The PIB

- **Policy Innovations:**
 - Stress-tolerant seeds, crop insurance, micro-irrigation, and natural farming have improved resilience and farmer income.
 - Digital initiatives like AgriStack provide real-time data to farmers, enabling precision agriculture and informed decisions.

- **FAO's Publication:** Launch of a coffee-table book, *"Sowing Hope, Harvesting Success,"* showcasing India-FAO cooperation milestones.
- **Global Perspective:** FAO Representative **Takayuki Hagiwara** and UN Resident Coordinator **Shombi Sharp** acknowledged India's leadership in ensuring global food security and its contribution to **SDGs and Viksit Bharat 2047**.

India-FAO Partnership: A Historical Perspective

Phase	Focus Area	Outcome
1940s–1960s	Technical cooperation, research in cereals	Foundation for food policy and extension services
1960s–1980s	Green Revolution & irrigation expansion	Achieved grain self-sufficiency
1990s–2010s	Diversification, horticulture, and livestock	Boosted farm incomes and exports
2015–2025	Climate-smart & digital agriculture	Global recognition for food security and sustainability

India's Global Leadership in Food Security

1. **Humanitarian Supply Chain:** India has emerged as a **first responder** in global food crises—exporting rice, wheat, and pulses to Africa, the Middle East, and neighboring countries.
2. **Rights-Based Approach:** The **NFSA (2013)** exemplifies India's commitment to food as a human right.
3. **Climate-Smart Vision:** India's focus on

sustainable agriculture, organic and natural farming aligns with **SDG 2 - Zero Hunger** and **SDG 13 - Climate Action**.

4. **Digital Transformation:** Through **AgriStack**, **Kisan Credit Card digitization**, and **e-NAM**, India is integrating farmers into global agri-value chains.

Conclusion:

India's 80-year partnership with the FAO is a model of how **policy, science, and international cooperation** can eradicate hunger and create sustainable food systems. As the world faces new challenges—climate change, supply disruptions, and rising population—India's experience offers a blueprint for developing nations seeking resilient agricultural growth.

India's Travails in Negotiating a Friendless World

Source: The Hindu

UPSC Relevance: GS2 International Relations

Context: India's Diplomatic Isolation

Why in News?

- India faces a growing trust deficit and diminishing geopolitical relevance as it struggles to adapt its foreign policy to a fragmented and friendless global order..

Introduction

- In the 21st century's rapidly shifting geopolitical environment, India finds itself navigating an increasingly complex and fragmented world order.
- As global power structures realign, India's foreign policy faces the challenge of maintaining strategic autonomy while responding to new security, economic,

and diplomatic realities.

- India's growing "trust deficit" and its diminishing geopolitical relevance in a world where alliances are fluid, regional rivalries intensifying, and multilateralism weakening.

Evolving Global Order: From Multilateralism to Fragmentation

- The global order, which once relied on multilateral frameworks for cooperation, has witnessed a steady erosion since the advent of Donald Trump's presidency in the United States.
- **Erosion of multilateralism:** Institutions like the UN, WTO, and WHO have been weakened as major powers increasingly act unilaterally.
- **Rise of transactional diplomacy:** Nations are prioritizing short-term, interest-based engagements over long-term partnerships.
- **India's predicament:** Despite being one of the world's top five economies, India has struggled to adapt its diplomacy to these changes. Its traditional approach—rooted in the Nehruvian ideals of non-alignment and moral leadership—appears increasingly outdated in a world dominated by pragmatic power politics.



(Image Source: The Hindu)

India's Declining Geopolitical Relevance

- Despite its economic and demographic strength, India's diplomatic footprint

appears to be shrinking in key regional and global arenas.

Exclusion from the West Asian Peace Process

- The recent **Gaza peace settlement**, orchestrated by the U.S. with support from Türkiye, Egypt, and Qatar, marked a turning point in the region's politics.
- India's **absence from this high-profile process**—and its minimal representation at subsequent reconciliation events—highlighted a growing perception of India's **irrelevance in West Asian diplomacy**.
- Ironically, nations like Türkiye, historically critical of India, played decisive roles, underlining India's diplomatic isolation in a region where it once enjoyed historical goodwill and influence.

Missed Opportunities in the Neighbourhood

- India's **absence during Nepal's "Gen Z revolution"** reflected a lack of strategic foresight and depth in its neighbourhood policy.
- The turmoil in Nepal, similar to youth movements in Bangladesh and Indonesia, unfolded on India's doorstep, yet New Delhi remained a bystander.
- This detachment risks eroding India's traditional influence in South Asia—its immediate strategic periphery.

Challenges in the Neighbourhood

- India's neighbourhood, once seen as its natural sphere of influence, is undergoing rapid political transformation.

Afghanistan-Pakistan Volatility

- The conflict between the Afghan Taliban and Pakistan threatens regional stability.
- India's satisfaction at Pakistan facing

Taliban attacks could prove **shortsighted**, as prolonged instability in the region directly impacts India's security.

- With **Pakistan's military leadership consolidating power** under Field Marshal Asim Munir, the threat to India's western frontier remains significant.

Strained Relations with Smaller Neighbours

- Countries like **Bangladesh and Nepal**, historically close to India, are increasingly perceived as drifting towards China.
- A mix of **perceived interference, border issues**, and **economic dependencies** has strained these relationships.
- Even India-Sri Lanka relations, though apparently stable, remain vulnerable to **Chinese influence** and local political fluctuations.

The China Challenge

- India's relationship with China remains the most complex and consequential of its external engagements.
- The so-called **India-China détente post-Tianjin (2025)** appears to be more symbolic than substantive.
- India's tendency to **downplay the 2020 Galwan Valley clash** risks sending the wrong signal – one of complacency amid continuing border tensions.
- China's **covert expansion** in India's extended neighbourhood through economic penetration, infrastructure projects, and cyber influence demonstrates its long-term strategy to **eclipse India's regional leadership**.
- China's President **Xi Jinping's assertive diplomacy** contrasts sharply with India's cautious engagement. While China uses trade, technology, and influence

operations to reshape Asia's order, India's response often lacks agility and coherence.

Strategic Realignments in West Asia

- India's traditional influence in West Asia is diminishing.
- The new **Saudi Arabia-Pakistan Strategic Mutual Defence Agreement** marks a strategic setback for India.
- Countries like **Türkiye, Egypt, and Iraq** have emerged as regional mediators, while India remains on the sidelines.
- With **China's growing footprint** in the Gulf and **U.S. retrenchment**, India risks being marginalized in a region vital for its energy and diaspora interests.

A Friendless World: Causes of India's Diplomatic Isolation

- India's current predicament can be attributed to several structural and strategic shortcomings:
- **Overreliance on Strategic Autonomy:** While maintaining independence in foreign affairs is vital, excessive rigidity prevents proactive alliance-building.
- **Reactive rather than proactive diplomacy:** India's responses often lag behind fast-moving geopolitical developments.
- **Limited institutional innovation:** India's foreign policy establishment remains steeped in legacy thinking of the 1940s-50s, lacking adaptability to emerging realities.
- **Neglect of regional diplomacy:** India's 'Neighbourhood First' policy has faltered in implementation, leading to alienation among smaller neighbours.
- **Communication gap and trust deficit:** India's inability to project its intentions clearly in the international arena has widened the perception of unreliability.

The Way Forward: Towards a Flexible and Realist Foreign Policy

- To regain its geopolitical relevance and address the growing trust deficit, India needs a **strategic reset** built on realism, flexibility, and innovation.

1. Reimagining Regional Diplomacy

- Reinforce **South Asian solidarity** through genuine economic integration, connectivity, and people-to-people ties.
- Actively engage in **regional crisis management**, avoiding the image of a passive observer.

2. Strategic Balancing

- Deepen **quad-level cooperation** (India, U.S., Japan, Australia) to maintain Indo-Pacific stability.
- Simultaneously strengthen ties with **ASEAN, Africa, and the Gulf** to diversify partnerships beyond the West.

3. Managing China Pragmatically

- Combine **deterrence and dialogue** to maintain border stability while safeguarding national interests.
- Invest in **technological resilience, cybersecurity, and supply-chain diversification** to counter China's economic leverage.

4. Institutional and Ideational Renewal

- Reform India's foreign policy institutions to reflect **modern strategic thinking**.
- Enhance training, inter-ministerial coordination, and foresight capabilities within the Ministry of External Affairs (MEA).

5. Leveraging Soft Power and Civilizational Identity

- India's distinct civilizational ethos—rooted in pluralism, democracy, and peace—must be projected as a **counter-model** to authoritarian or theocratic

regimes.

- Use **cultural diplomacy, diaspora engagement, and development partnerships** to rebuild trust globally.

Conclusion:

- India stands at a critical juncture in global politics. As traditional alliances weaken and new power blocs emerge, India must adapt to a more unpredictable and fragmented world. The path forward requires **strategic agility, institutional reform, and diplomatic innovation**.

India Formally Upgrades its 'Technical Mission' in Kabul to a Full Embassy

Source: Indian Express

UPSC Relevance: GS2 International Relations

Context: Indian Embassy in Afghanistan

Why in News?

India upgrades its technical mission in Kabul to a full embassy to strengthen bilateral ties, provide humanitarian aid, and safeguard strategic interests without formally recognizing the Taliban regime.

Background

- India has announced the upgrading of its *technical mission* in Kabul to the status of a **full-fledged embassy**, marking a significant diplomatic shift in its engagement with Afghanistan.
- This move comes after External Affairs Minister S. Jaishankar's recent meeting with Afghanistan's acting Foreign Minister, **Amir Khan Muttaqi**, signalling India's intent to restore its diplomatic presence in the Taliban-ruled nation.

Background

- In **August 2021**, India withdrew its embassy staff from Kabul following the **Taliban's takeover** of Afghanistan after the withdrawal of U.S. troops.
- To maintain limited engagement, India re-established a **"technical team"** in June 2022, primarily to oversee humanitarian assistance and operational matters.
- The decision to now elevate this team to a full **embassy** demonstrates a renewed effort to strengthen India-Afghanistan relations amid changing regional geopolitics.



(Image Source: Indian Express)

Key Highlights of the Move

- **Restoration of Full Diplomatic Presence:** The upgraded embassy will function under a *Charge d'Affaires* and will handle all diplomatic, consular, and developmental affairs.
- **Enhancement of Bilateral Engagement:** The move aligns with India's policy of maintaining people-centric relations with Afghanistan, even without formally recognizing the **Taliban regime**.
- **Strengthening Developmental Cooperation:** According to the **Ministry of External Affairs (MEA)**, the embassy will contribute to Afghanistan's *comprehensive development, humanitarian aid, and capacity-building* based on Afghan society's priorities.
- **Security and Counterterrorism**

Assurance: During his recent six-day visit to India, Muttqi assured that **Afghan soil would not be used against India** and recognized the shared concern over the threat posed by **Daesh (ISIS)** in the region.

- **Reciprocal Diplomatic Steps:** Afghanistan also indicated plans to send its diplomats to India, marking the start of gradual normalization of bilateral cooperation.

India's Interests in Afghanistan

- **Strategic and Security Interests:**
 - Stability in Afghanistan is critical for **India's regional security**, especially to curb the spread of terrorism and prevent cross-border threats.
 - It helps India maintain a foothold in Central Asia amid growing Chinese and Pakistani influence.
- **Economic and Developmental Interests:**
 - India has been one of the **largest regional donors** to Afghanistan, contributing over **\$3 billion** in development assistance since 2001.
 - Projects include the **Afghan Parliament building, Zaranj-Delaram Highway, and Salma (India-Afghanistan Friendship) Dam**.
- **Humanitarian Commitment:**
 - India continues to supply **food grains, vaccines, and medical aid** to Afghanistan under the UN's humanitarian framework.

Challenges Ahead

- **Non-recognition of the Taliban regime:** India must balance engagement without legitimizing the Taliban's governance structure.
- **Security Risks:** Kabul remains volatile, with the presence of terrorist groups

posing potential risks to Indian personnel and assets.

- **Geopolitical Competition:** China, Pakistan, and Iran are already deepening their engagement with the Taliban, creating a complex regional environment for India.

Significance of the Move

- Marks **India's return as an active diplomatic player** in Afghanistan after four years of reduced presence.
- Strengthens **India's soft power** through humanitarian and developmental diplomacy.
- Offers potential for **counter-terror cooperation** and regional stability through dialogue.
- Signals India's **strategic autonomy** in foreign policy — engaging pragmatically even with non-recognized regimes for regional stability.

Conclusion:

- India's decision to upgrade its technical mission in Kabul to a full embassy underscores a **pragmatic recalibration** of its foreign policy towards Afghanistan.

India's Buddha Relics Inspire Record Devotion in Russia's Kalmykia

Source: PIB

UPSC Relevance: GS2 International Relations

Context: India Russia Cultural Ties

Why in News?

India's sacred Buddha relics were displayed in Kalmykia, Russia, drawing over 90,000 devotees and strengthening India-Russia spiritual and cultural ties.

Introduction

- The exposition of India's **Sacred Relics of Lord Buddha** in Kalmykia, Russia, has witnessed an **unprecedented spiritual response**, with over 90,000 devotees paying homage at the iconic **Geden Sheddup Choikorling Monastery**, popularly known as the *Golden Abode of Shakyamuni Buddha*.
- This event is a **historic first** for the Russian Republic and highlights India's role in promoting **Buddhist heritage abroad**.



(Image Source: PIB)

Exposition Details:

- The sacred relics, recognized as a **National Treasure of India**, were brought to Elista, the capital of Kalmykia, by a high-level Indian delegation.
- The delegation was led by **Shri Keshav Prasad Maurya**, Deputy Chief Minister of Uttar Pradesh, and included senior Indian monks.
- Special religious services and blessings were conducted for the **predominantly Buddhist population** of the region, the only European territory where Buddhism is the main religion.

Significance of the Monastery

- **Geden Sheddup Choikorling Monastery** is a major Tibetan Buddhist

center, inaugurated in 1996 in the vast Kalmyk steppe.

- It serves as a **cultural and spiritual hub**, linking the Buddhist traditions of India with Kalmykia's unique religious identity.
- The monastery is often referred to as the **Golden Abode of Shakyamuni Buddha**, symbolizing the enduring presence of Buddhism in Europe.

Cultural and Diplomatic Importance

India-Russia Civilizational Ties:

- This exposition underscores the **historical and cultural bonds** between India and Russia.
- It recalls the legacy of the **19th Kushok Bakula Rinpoche**, a revered Buddhist monk and diplomat from Ladakh, who **revived Buddhism** in Mongolia and Russian regions such as Kalmykia, Buryatia, and Tuva.

Soft Power and Cultural Diplomacy:

- India's role in sharing **Buddhist relics abroad** is an example of **soft power diplomacy**, enhancing mutual understanding and spiritual ties.
- By facilitating the exposition, India demonstrates its commitment to **preserving global Buddhist heritage** and strengthening **people-to-people connections**.

Organisers and Institutional Collaboration

- The exposition is organized by the **BTI section of the Ministry of Culture**, Government of India, in collaboration with:
- **International Buddhist Confederation (IBC)**

National Museum, India

- **Indira Gandhi National Centre for the Arts (IGNCA)**

- These institutions ensure a **structured, respectful, and scholarly presentation** of the relics while promoting cultural education and awareness.

Impact and Significance

• Religious & Spiritual Impact:

- The event has ignited **mass spiritual participation**, reflecting the **enduring reverence** for Lord Buddha.
- It strengthens the **cultural identity** of Kalmykia's Buddhist population while reconnecting them with **India's spiritual heritage**.

• Civilizational Message:

- Highlights India's historical role in the **spread and sustenance of Buddhism** across Asia and parts of Europe.
- Reinforces India's image as the **custodian of Buddhist heritage** and a **center of global spiritual diplomacy**.

• Tourism & Cultural Exchange:

- Such events encourage **religious tourism**, intercultural dialogue, and strengthen **bilateral cultural ties**.
- It offers opportunities for **scholarly exchanges** and collaborative research on Buddhist history and art.

Conclusion:

- The exposition of India's sacred Buddha relics in Kalmykia serves as a **historic milestone** in India-Russia cultural relations. It is not only a **religious and spiritual event** but also a **symbol of India's soft power**, reflecting the deep **civilizational bonds** shared across nations.
- By organizing and facilitating this event, India continues to play a **central role in preserving and promoting Buddhist**

heritage globally, fostering mutual understanding and spiritual connectivity.

A Test of the 'ASEAN Way' and a New Chapter in Regional Integration

Source: The Diplomat

UPSC Relevance: GS2 International Relations

Context: ASEAN

Why in News?

- Timor-Leste's accession to ASEAN tests the bloc's consensus-based "ASEAN Way" and presents both economic and strategic opportunities for the country.

Introduction

- The expected admission of **Timor-Leste** into the **Association of Southeast Asian Nations (ASEAN)** marks a historic and transformative moment for both parties.
- For Timor-Leste, the youngest and one of the poorest nations in Asia, ASEAN membership represents an avenue for economic integration, political affirmation, and regional visibility.
- For ASEAN, this admission tests the limits of its long-held consensus-based approach — often called the "ASEAN Way" — and opens the door for institutional introspection and possible reform.

Historical Background: From Independence to Integration

- Timor-Leste's path to regional inclusion has been long and complex.
- Early aspirations:** Even before Indonesia's invasion in 1975, East Timor's nationalist leaders envisioned a

state with close ties to ASEAN.

- Post-occupation context:** Following decades of resistance and the 1999 *New York Agreements*, the United Nations Transitional Administration guided the country toward independence in 2002.
- Formal engagement:** Timor-Leste signed the *ASEAN Treaty of Amity and Cooperation (2007)* and applied formally for membership in 2011.
- Strategic goals:** Its *Strategic Development Plan (2011–2030)* highlighted ASEAN membership as vital to geographic, economic, and cultural integration.
- By 2014, the country met the **Article 6** admission criteria of the *ASEAN Charter* — including geographic location, recognition by member states, adherence to ASEAN principles, and willingness to fulfill obligations. However, membership was delayed for over a decade due to internal hesitations within ASEAN.

ASEAN's Hesitation and the 'ASEAN Way'

ASEAN's reluctance to admit Timor-Leste revealed the limits of its decision-making framework — the "ASEAN Way", characterized by:

- Consensus-based decision-making
- Non-interference in internal affairs
- Respect for sovereignty and gradualism
- While this approach has ensured unity among diverse members since 1967, it has also constrained institutional reform and timely decision-making.
- Some members, particularly **Singapore and Myanmar**, expressed reservations about Timor-Leste's readiness, citing weak infrastructure and limited administrative capacity.
- The final breakthrough came with ASEAN's "in-principle" admission of

Timor-Leste in **2022**, followed by a full decision to admit it as the **11th member** in **May 2025**.

- This prolonged process became a **stress test for ASEAN's flexibility**, showing how consensus can delay progress even when political will exists.

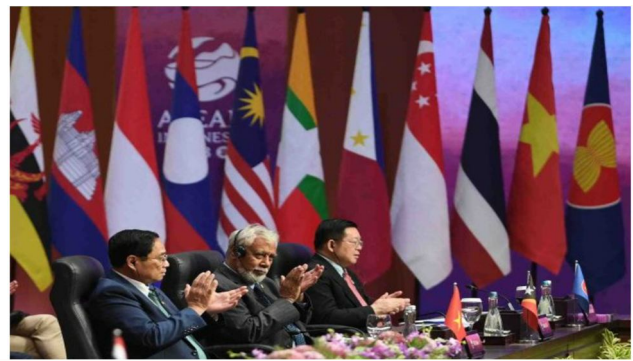
Timor-Leste's Strategic Motivations

- Timor-Leste's pursuit of ASEAN membership is rooted in both **economic necessity** and **strategic foresight**:
- **Economic Diversification**:
 - The nation's economy is heavily dependent on **oil and gas**, which account for the bulk of its revenues.
 - Membership in ASEAN and the **Regional Comprehensive Economic Partnership (RCEP)** offers opportunities to expand trade, attract investment, and foster **non-oil sectors** such as agriculture and tourism.
- **Reduced External Dependence**:
 - Declining U.S. aid and Washington's imposition of **10% tariffs** on Timorese exports increased its economic vulnerability.
 - In contrast, a **2023 Comprehensive Strategic Partnership with China** deepened its participation in the *Maritime Silk Road*, though raising concerns about dependency on Beijing.
- **Human Resource Development**:
 - ASEAN integration demands **regulatory harmonization** and skilled governance.
 - Programs like Singapore's **E-Stars initiative** are helping Timorese officials build the necessary administrative and diplomatic capacity.
- **Regional Stability and Visibility**:

- Membership provides an institutional platform to engage in broader security and diplomatic dialogues, including the **ASEAN Regional Forum (ARF)** and **East Asia Summit (EAS)**.

ASEAN's Institutional and Political Challenges

- Timor-Leste's entry also mirrors ASEAN's own internal contradictions.
- The bloc's **consensus rule** has often paralyzed decision-making, evident in its muted response to crises such as **Myanmar's military coup** and **South China Sea disputes**.
- Many within ASEAN now advocate for **qualified majority voting** in technical and economic matters — a reform resisted by traditionalists citing sovereignty concerns.
- The "ASEAN-X" formula, allowing flexible participation by willing members, is being discussed to avoid gridlock.
- Hence, Timor-Leste's accession symbolizes not just expansion, but the need to **modernize ASEAN's institutional architecture** to remain relevant amid great power rivalry.



(Image Source: The Diplomat)

Economic Implications and Developmental Challenges

While ASEAN membership opens new economic avenues, it also poses structural challenges for Timor-Leste:

Capacity and Infrastructure Gaps:

- Timor-Leste has the **lowest GDP per capita** in Southeast Asia and a fragile bureaucracy.
- Its integration into the **ASEAN Free Trade Area (AFTA)** will likely be gradual, as was the case with Vietnam and Laos.

Trade and Investment Potential:

- Over **60% of Timor-Leste's imports** already come from ASEAN states.
- Harmonizing customs regulations and improving fiscal management can attract FDI, particularly in **agriculture, fisheries, and small-scale industries**.

Human Capital and Employment:

- Unemployment, especially among youth (~20%), remains a pressing issue.
- Increased intra-ASEAN mobility could provide opportunities for the workforce, but also demands improved education and vocational skills.

Economic Diversification and Sustainability:

- ASEAN integration may stimulate **non-oil sectors**, especially **value-added agriculture** and **sustainable tourism** — essential for long-term stability.

Geopolitical Context and the U.S.-China Factor

- Timor-Leste's accession occurs amid intensifying **U.S.-China rivalry** in Southeast Asia.
- The country's strategic partnership with China strengthens its infrastructure base but also raises ASEAN's concerns over potential Chinese leverage.
- Timor-Leste's foreign policy emphasizes **neutrality** and **non-alignment**, consistent with ASEAN's preference for

maintaining regional autonomy amid global polarization.

- ASEAN's challenge is to **maintain centrality** and avoid fragmentation in a multipolar environment — a goal complicated by differing member alignments.

ASEAN at a Crossroads: Reform and Reflection

- As ASEAN approaches its **60th anniversary in 2027**, internal debates about the relevance of its model are intensifying.
- The "**ASEAN Community Vision 2045**", adopted in May 2025, recognizes the need for structural reforms to enhance efficiency, adaptability, and inclusiveness.
- Timor-Leste's admission thus serves as a **catalyst for introspection**, urging the bloc to reconcile sovereignty concerns with the imperatives of regional integration.

Conclusion:

- Timor-Leste's long-awaited ASEAN membership represents far more than a diplomatic milestone — it is a **test case for ASEAN's adaptability** and **Timor-Leste's nation-building capacity**. As President José Ramos-Horta aptly stated, *"We would have to be really dumb and lazy if we do not benefit because there is potential for taking advantage of ASEAN membership."*

Protest over China-backed Teesta Plan in Bangladesh: A Red Flag for Delhi

Source: India Today

UPSC Relevance: GS 2 International

Relations, India's neighbourhood relations

Context: Teesta River issue

Why in News?

Protests in Bangladesh demand the implementation of the China-backed Teesta Master Plan amid stalled water-sharing talks with India, raising strategic concerns for New Delhi near the Siliguri Corridor.

Background

- Recent protests in Bangladesh demanding the implementation of the **China-backed Teesta River Master Plan** have triggered fresh concerns in New Delhi. The development comes at a time when **Teesta water-sharing negotiations between India and Bangladesh** remain stalled for over a decade.
- The involvement of **China**—through infrastructure investments and proposed river management projects—adds a **strategic dimension** to what was primarily a bilateral water-sharing issue.
- For India, the Teesta River is not merely a matter of water diplomacy but also of **national security**, given the river's geographical proximity to the **Siliguri Corridor (Chicken's Neck)** — a critical and narrow land bridge connecting mainland India to the Northeastern states.

Origin and Course of the Teesta River

- The **Teesta River** originates from the **Tso Lhamo Lake** in the **eastern Himalayas of Sikkim, India**.
- It flows through **Sikkim** and **West Bengal**, covering around 315 km in India before entering **Bangladesh**.
- In Bangladesh, it traverses about 121 km through **Rangpur division**, ultimately joining the **Brahmaputra (Jamuna) River**

near **Chilmari**.

- The river is vital for **irrigation, drinking water, and livelihoods** in both countries, especially in **northern Bangladesh** and **northern West Bengal**.



(Image Source: India Today)

Background: The Stalled Teesta Water-Sharing Agreement

- Efforts to formalize the **Teesta water-sharing deal** between India and Bangladesh date back to the **1980s**.
- In **2011**, a draft agreement proposed that **India would get 42.5%** and **Bangladesh 37.5%** of Teesta's waters.
- However, the deal was never signed due to **political opposition from the West Bengal government**, which feared that sharing additional water would harm the state's agriculture during the lean season.
- Since then, negotiations have stalled, creating frustration in Bangladesh, which claims it faces **severe water shortages during the dry months (December-May)** and **flooding during monsoons**, due to lack of coordinated management.

China's Entry: The Teesta River Master Plan

- In response to India's prolonged inaction, Bangladesh has been considering a **\$1 billion Chinese-backed Teesta River Comprehensive**

Management and Restoration Project, also called the **Teesta Master Plan**.

Key Features of the Chinese Proposal

- **River Dredging and Embankment Construction** to prevent floods and improve navigation.
- **Irrigation Infrastructure** to enhance agricultural productivity in northern Bangladesh.
- **Water Reservoirs and Canals** to ensure year-round water supply.
- **Hydropower and Economic Zones** along the river basin.
- China has proposed implementing the plan under its **Belt and Road Initiative (BRI)** framework, which has already seen major investments in ports and infrastructure across South Asia.

Recent Developments: Protests and Public Sentiment in Bangladesh

- In **October 2025**, large rallies and torchlight processions were held in **Chattogram** and across the **Rangpur division**, demanding immediate implementation of the Teesta Master Plan.
- Protesters accused India of “**water injustice**” and urged the Bangladesh government to move ahead with China’s plan.
- Organizers claimed the project could **transform northern Bangladesh**, improve **agriculture**, and generate **employment opportunities**.
- These protests indicate a **growing domestic pressure** on Dhaka to act independently of New Delhi’s concerns, particularly as water scarcity becomes a politically sensitive issue ahead of national elections.

Why China’s Role Raises Red Flags for

India

1. Strategic Proximity to the Siliguri Corridor

- The **Teesta River Basin** lies close to India’s **Siliguri Corridor** – a narrow, 20–22 km wide stretch that connects India’s Northeast with the rest of the country. Any **Chinese presence or infrastructure development** in the nearby Bangladeshi region could pose **security threats** or **surveillance risks**, especially during geopolitical tensions.

2. Expansion of Chinese Influence in South Asia

- China’s deepening footprint through the Teesta project mirrors its strategy in other South Asian countries – such as the **Hambantota Port in Sri Lanka** and **Gwadar Port in Pakistan** – where economic projects have evolved into **strategic assets**. For India, this represents another step in **Beijing’s encirclement strategy** under the so-called “**String of Pearls**” framework.

3. Undermining India-Bangladesh Bilateral Mechanisms

- Water cooperation has been a cornerstone of India-Bangladesh relations. A Chinese role could **bypass bilateral frameworks** like the **Joint Rivers Commission (JRC)**, undermining trust and diplomatic engagement between the two neighbours.

Security and Environmental Risks

- Chinese involvement in **hydrological and engineering works** near shared river systems may affect **water flow patterns, sedimentation, and ecological balance**.
- India fears potential **data asymmetry** and **strategic manipulation** of river management information.

Timing Amid Ganga Treaty Expiry

- The protests and Chinese push coincide with the **upcoming expiry of the 1996 Ganga Water Sharing Treaty** in 2026.
- Bangladesh's pursuit of an alternative water deal with China could signal a **shift in its diplomatic orientation**, complicating future negotiations with India on shared rivers.

India's Concerns and Policy Challenges

- For New Delhi, the Teesta issue involves balancing multiple objectives:
- Maintaining **strategic influence** in South Asia amid China's assertiveness.
- Preserving **security of the Siliguri Corridor**.
- Ensuring **domestic consensus** with the West Bengal government on water-sharing.
- Sustaining **trust-based cooperation** with Dhaka, which has been a key partner in counterterrorism, trade, and connectivity.
- India has recently explored alternative projects, including offering **grant-based assistance** for Teesta basin development, but **implementation delays** have weakened its position vis-à-vis China's ready financing.

Conclusion:

- The China-backed Teesta Master Plan represents more than a river management project — it is a **test case for India's regional influence** and strategic resilience in South Asia.

Journalists Imprisoned in Belarus and Georgia Win EU's Top Human Rights Award

Source: The Hindu

UPSC Relevance: Awards and Honours, GS2 International Relations

Context: EU's Top Human Rights Award

Why in News?

Two imprisoned journalists from Belarus and Georgia, Andrzej Poczobut and Mzia Amaghlobeli, won the EU's Sakharov Prize 2025 for defending human rights and press freedom.

Introduction

- The European Union's prestigious **Sakharov Prize for Freedom of Thought 2025** has been jointly awarded to **Andrzej Poczobut** from Belarus and **Mzia Amaghlobeli** from Georgia — two journalists imprisoned for their commitment to truth, press freedom, and democratic ideals.
- Their recognition underlines the EU's continued emphasis on defending **freedom of expression** and supporting **journalists persecuted under authoritarian regimes**.



(Image Source: The Hindu)

About the Sakharov Prize

- **Full Name:** Sakharov Prize for Freedom of Thought

- **Established:** 1988 by the **European Parliament**
- **Named After:** *Andrei Sakharov*, Soviet physicist, dissident, and Nobel Peace Prize laureate, known for his human rights activism.
- **Objective:** To honour individuals or groups who have made exceptional contributions in defending **human rights and fundamental freedoms**.
- **Reward:** €50,000 and recognition by the European Parliament at a ceremony in Strasbourg.
- The prize is considered **the highest tribute** paid by the EU to human rights defenders and is often seen as a **precursor to the Nobel Peace Prize**, with several past recipients later winning that honour.

- **Profession:** Founder of two of Georgia's leading independent media outlets.
- **Charges:** Convicted in August 2025 for allegedly slapping a police chief during an anti-government protest.
- **Sentence:** Two years imprisonment.
- **Context:**
- Rights organizations denounced her conviction as a politically motivated attempt to silence dissent. Amaghlobeli's work has focused on government accountability and corruption, often challenging the ruling establishment.
- Her case reflects **growing concerns about democratic backsliding in Georgia**, where the independence of the press and judiciary has been increasingly questioned.

The 2025 Laureates

1. Andrzej Poczobut (Belarus)

- **Profession:** Correspondent for the Polish daily *Gazeta Wyborcza* and representative of the Polish minority in Belarus.
- **Charges:** Convicted of "harming Belarus' national security."
- **Sentence:** Eight years imprisonment in the **Novopolotsk penal colony**.
- **Background:** Poczobut is a long-time critic of the **Alexander Lukashenko regime**, known for suppressing dissent and restricting media freedom. His reporting on political repression and minority rights made him a target of state persecution.
- His imprisonment is emblematic of **Belarus's broader crackdown on independent media** following the disputed 2020 presidential elections, where protests were violently suppressed and journalists were arrested en masse.

2. Mzia Amaghlobeli (Georgia)

European Parliament's Statement

- European Parliament President **Roberta Metsola** described both laureates as "**symbols of the struggle for freedom and democracy**," adding that they were imprisoned on **trumped-up charges** simply for "doing their work and speaking out against injustice."
- This recognition serves as a **strong message of solidarity** from the EU toward journalists and activists facing oppression across Europe and its neighbourhood.

Significance of the Award

- **Defense of Press Freedom:** The award underscores the EU's commitment to safeguarding media independence as a **core democratic value**.
- **Symbolic Support for Political Prisoners:** By honouring imprisoned journalists, the EU highlights the plight of those who resist state censorship and endure persecution for truth-telling.
- **Geopolitical Signal:** Awarding figures

from **Belarus and Georgia** — two countries at the intersection of European and Russian influence — carries a political message about **EU's support for democratic movements** in its Eastern neighbourhood.

- **Past Laureates and Legacy**
- Notable recipients of the Sakharov Prize include:
 - **Nelson Mandela** (1988) – South African anti-apartheid leader.
 - **Malala Yousafzai** (2013) – Pakistani education activist.
 - **Denis Mukwege** (2014) – Congolese doctor and Nobel Peace laureate.
 - **Nadia Murad** (2016) – Yazidi activist and Nobel laureate.
 - **Sviatlana Tsikhanouskaya** and **Belarusian opposition** (2020).
 - **María Corina Machado** (2024) – Venezuelan opposition leader and 2025 Nobel Peace Prize winner.
- Such recognition often amplifies global awareness about **human rights crises** and increases international pressure on repressive governments.

Reviving Multilateralism: Reforming the UN and Rebuilding Global Trust

Source: Indian Express

UPSC Relevance: GS2 International Relations, multilateralism

Context: Multilateralism

Why in News?

The 80th UN General Assembly highlights the challenges and opportunities for multilateralism, emphasizing the need for reform and legitimacy in global cooperation.

Introduction

- As the United Nations marks its 80th anniversary, the world stands at a crossroads. The optimism that once surrounded the UN's founding — the belief that diplomacy could triumph over destruction — has faded.
- Yet, as Shashi Tharoor argues, multilateralism is not dead; it is wounded and in need of renewal. The survival of global cooperation depends not only on reforming international institutions but also on rebuilding their legitimacy in the eyes of ordinary people.

Background

- As the United Nations marks its 80th anniversary, the world faces an unprecedented convergence of crises — wars, climate change, inequality, and technological disruption.
- While multilateral institutions like the UN are under strain, they remain essential for addressing global challenges. Their survival depends not on nostalgia but on meaningful reform and renewed legitimacy.

The Current Challenges to Multilateralism

The UN and global multilateralism face multiple pressures:

- **Declining commitment from major powers:** Some states have reduced funding to key UN programmes, withdrawn from certain bodies, or bypassed multilateral processes in favour of bilateral or mini-lateral arrangements.
- **Geopolitical tensions:** Rivalries among major powers, conflicts in Ukraine, Sudan, and Gaza, and regional nationalism have fragmented global

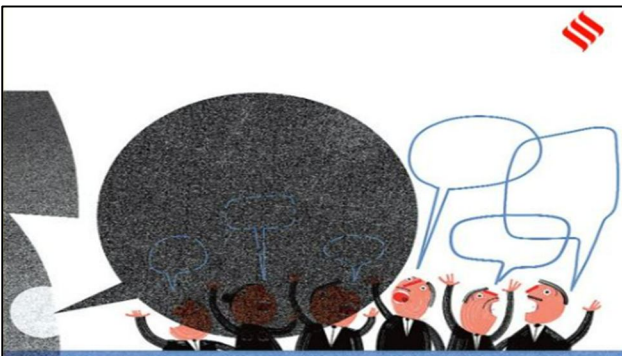
consensus.

- **Erosion of public trust:** Rising populism and scepticism about global elites have weakened citizens' faith in international institutions.
- These factors have created a perception that multilateralism is outdated and ineffective, yet the global problems themselves – from pandemics to climate change – remain borderless and require collective solutions.

Achievements of the Multilateral System

Despite its limitations, the UN has delivered notable outcomes:

- Coordinated global humanitarian responses and peacekeeping operations.
- Formulated universal agreements such as the Universal Declaration of Human Rights, Sustainable Development Goals, and the Paris Climate Accord.
- Provided a platform for smaller nations to voice concerns and engage in global policymaking.
- However, structural constraints – such as Security Council veto powers, weak enforcement, and outdated governance reflecting post-World War II geopolitics – have limited effectiveness.



(Image Source: Indian Express)

The Path to Renewal

The future of multilateralism depends on **institutional reform** and **rebuilding legitimacy**:

- **Institutional reform:** Streamlining mandates, improving cost efficiency, and enhancing accountability can strengthen the system's operational capacity.
- **Rebuilding legitimacy:** Global institutions must demonstrate tangible benefits for ordinary citizens – jobs, security, social dignity – not just abstract norms. Multilateralism must become more empathetic, responsive, and inclusive.
- The philosophical challenge lies in balancing global interdependence with national sovereignty and addressing the concerns of citizens who feel left behind by globalization.

Strategic Implications for Emerging Powers

Emerging powers have an opportunity to champion a more equitable global order:

- Promote incremental institutional reforms and transparency in international governance.
- Engage in value-based coalitions to deliver practical solutions on climate, health, and technology.
- Use mini-lateral groupings strategically to pilot initiatives that can later be scaled into universal norms.
- Link multilateral commitments to visible domestic benefits, reducing scepticism about international engagement.

Conclusion:

- Multilateralism is fraying but not obsolete. Its survival requires principled yet pragmatic approaches, combining institutional reform with renewed public legitimacy.
- In an interconnected world, no nation can be truly sovereign unless all are, making global cooperation

indispensable for addressing the crises of the 21st century.

India-ASEAN Partnership and the 47th ASEAN Summit

Source: India Today

UPSC Relevance: GS 2 International Relations

Context: 47th ASEAN Summit

Why in News?

Prime Minister Narendra Modi virtually addressed the 47th ASEAN Summit in Kuala Lumpur, highlighting India-ASEAN partnership, aligning *ASEAN Vision 2045* with *Viksit Bharat 2047*, and declaring 2026 as the "Year of ASEAN-India Maritime Cooperation."

Background

- Prime Minister Narendra Modi virtually addressed the **47th ASEAN Summit**, held in **Kuala Lumpur, Malaysia**, reaffirming India's deepening engagement with the **Association of Southeast Asian Nations (ASEAN)**.
- Highlighting the theme of "*Inclusivity and Sustainability*", PM Modi declared the **21st century as the shared era of opportunity for India and ASEAN**, rooted in mutual growth, stability, and prosperity.

About ASEAN

- **Full Form:** Association of Southeast Asian Nations

Establishment: 8 August 1967

- **Founding Members:** Indonesia, Malaysia, the Philippines, Singapore, and Thailand
- **Current Members (11):** Indonesia, Malaysia, the Philippines, Singapore, Thailand, Brunei, Vietnam, Laos,

Myanmar, Cambodia, and East Timor (new member welcomed in 2025).

Headquarters: Jakarta, Indonesia

- **Primary Objective:** To accelerate economic growth, social progress, and cultural development in the region, and to promote regional peace and stability through mutual respect and cooperation.

About the ASEAN Summit

- The **ASEAN Summit** is the highest decision-making body of ASEAN, held annually.
- It brings together leaders of all member states and key dialogue partners such as India, China, the U.S., Japan, Australia, and the EU.
- The summit serves as a platform to discuss regional political, economic, and security issues and to strengthen cooperative frameworks like the **ASEAN+1**, **ASEAN+3**, and **East Asia Summit (EAS)** mechanisms.
- The **47th ASEAN Summit (2025)** focused on the theme "*Inclusivity and Sustainability*", emphasizing digital inclusion, food security, climate resilience, and sustainable supply chains.



(Image Source: ASEAN.org)

Highlights of PM Modi's Address

- **Shared Vision for the 21st Century:** PM Modi declared, "*The 21st century is our century – it is India and ASEAN's century*," linking **ASEAN Community**

Vision 2045 with **India's Viksit Bharat 2047**. Both visions aspire for peace, prosperity, innovation, and sustainable development by mid-century.

- **Comprehensive Strategic Partnership:** Modi underlined that even amid global uncertainties, the **India-ASEAN Comprehensive Strategic Partnership (CSP)** continues to advance as a **pillar of global stability and sustainable development**.
- **Economic and Demographic Strength:** India and ASEAN together represent **nearly one-fourth of the world's population**, and their combined GDP exceeds **\$6 trillion**, making them a significant engine of global growth.

Areas of Cooperation Highlighted:

- **Digital Inclusion:** Collaborations in digital public infrastructure and fintech innovation.
- **Food Security:** Cooperation in sustainable agriculture and climate-resilient farming.
- **Maritime Security:** Strengthening cooperation in **Humanitarian Assistance and Disaster Relief (HADR)**, blue economy, and sea-lane safety.
- **Supply Chain Resilience:** Reducing overdependence on single sources by creating diversified and sustainable supply chains.
- **"Year of ASEAN-India Maritime Cooperation (2026)"** Modi announced **2026** as the year dedicated to advancing maritime connectivity, emphasizing the Indo-Pacific vision of a **free, open, and inclusive maritime order**.

Context of Global Trade and the India-U.S. Tariff Issue

- The Kuala Lumpur Summit occurred against the backdrop of **ongoing trade**

tensions between India and the United States.

- The U.S. had expressed concerns over India's **import tariffs and digital trade policies**, while India criticized U.S. protectionist measures affecting exports such as steel, aluminum, and IT services.
- Despite these issues, PM Modi's virtual participation underscored India's commitment to **regional multilateralism** and its focus on **ASEAN centrality** in the **Indo-Pacific** strategy, balancing relations amid Washington's assertive trade posture.

ASEAN-India Relations: A Background

- **Dialogue Partnership (1992):** India became ASEAN's sectoral dialogue partner.
- **Full Dialogue Partner (1996) → Summit-Level Partnership (2002) → Strategic Partnership (2012) → Comprehensive Strategic Partnership (2022).**
- **Key Cooperation Areas:**
- **Connectivity:** India's Act East Policy supports the **India-Myanmar-Thailand Trilateral Highway** and **Kaladan Multimodal Transit Project**.
- **Trade:** ASEAN-India FTA in Goods (2010) and Services (2015).
- **Security:** Regular naval exercises like **SIMBEX, MILAN, and ADMM-Plus**.
- **Cultural:** Programs like **ASEAN-India Youth Exchange** and **Buddhist Heritage Tourism Circuit**.

Significance of India-ASEAN Partnership

- **Strategic:** Ensures peace and stability in the Indo-Pacific amid rising China-U.S. competition.
- **Economic:** Strengthens trade and investment flows, vital for India's manufacturing and export growth.

- **Maritime:** Promotes freedom of navigation, maritime safety, and disaster resilience.
- **Cultural and Historical:** Shared civilizational roots and people-to-people ties form the foundation of trust and cooperation.

Conclusion:

- PM Modi's address at the **47th ASEAN Summit** reaffirms India's steadfast commitment to ASEAN centrality and its vision for a **free, open, and rules-based Indo-Pacific**. By aligning "ASEAN Vision 2045" with "Viksit Bharat 2047," India seeks to co-create a future of **inclusive growth, sustainable development, and mutual prosperity**.

India's Diaspora Diplomacy and the Limits of Cultural Nationalism Abroad

Source: The Hindu

UPSC Relevance: **GS2 International Relations**

Context: India's Diaspora Diplomacy

Why in News?

- Recent incidents abroad involving overzealous cultural celebrations by sections of the Indian diaspora have highlighted tensions between India's diaspora diplomacy.

Background

- India today boasts one of the world's largest and most influential diasporas, comprising over **32 million people of Indian origin (PIOs) and Non-Resident Indians (NRIs)** spread across continents.
- This global Indian community has long been a source of economic, cultural, and

strategic strength for the nation.

- However, recent incidents in countries such as **Canada, Australia, and the United States** highlight growing tensions between **diaspora-driven cultural assertiveness** and the **sensitivities of host societies**.
- The challenge before India, therefore, lies in balancing **diaspora diplomacy** — a soft power tool aimed at leveraging global Indian networks — with the **limits of cultural nationalism** in multicultural democracies increasingly wary of foreign influence.

Historical Background: From Territorial to Cultural Nationalism

India's engagement with its diaspora has evolved dramatically since Independence.

Nehruvian Approach (Post-1947):

- Jawaharlal Nehru's foreign policy was guided by **territorial nationalism** — the idea that India's sovereignty lay within its borders and that Indians abroad should be loyal citizens of their adopted countries.

Nehru's stance was clear: India should not interfere in the domestic politics of other nations through its diaspora. The concerns of Indians abroad, especially regarding discrimination and racism, were raised as **universal human rights issues**, not as parochial ethnic grievances.

Shift in the 1990s:

- Liberalisation and the rise of globalisation expanded the Indian diaspora's economic and political visibility. Simultaneously, the rise of **Hindutva-driven cultural nationalism** redefined how Indian identity was represented abroad. The diaspora became a **vehicle for cultural assertion**

— celebrating Indian festivals, promoting Indic values, and, at times, engaging in the politics of identity.

Post-2014:

- Prime Minister Narendra Modi's outreach to the diaspora marked a turning point. Mega-rallies in **New York, London, and Sydney** projected the diaspora as "ambassadors of India's resurgence." This strengthened emotional and political bonds but also blurred the line between **diaspora pride** and **state-backed nationalism abroad**.

Comparison between PIOs and NRIs

Category	Non-Resident Indian (NRI)	Person of Indian Origin (PIO)
Definition	An Indian citizen who resides outside India for employment, business, or any other purpose indicating an indefinite stay abroad.	A foreign citizen (except those from Pakistan, Bangladesh, etc.) who is of Indian ancestry or whose ancestors were Indian nationals.
Citizenship	Indian citizen living abroad.	Foreign citizen (not holding Indian passport).
Legal Basis	Defined under Income Tax Act, 1961 and	Defined under the PIO Card Scheme (2002) (now merged with OCI scheme in 2015).

	Foreign Exchange Management Act (FEMA), 1999.	
Indian Passport	Holds an Indian passport .	Holds a foreign passport .
Voting Rights	Yes , can vote in Indian elections (must be physically present in the constituency).	No voting rights in India.
Property Ownership	Can buy residential and commercial property (except agricultural land or plantation property without permission).	Same as NRIs — can buy residential and commercial property, but need RBI approval for agricultural/plantation land.
Taxation in India	Taxed on income earned in India only , not on global income (if stays < 182 days in India).	Same taxation rule as foreign citizens — only income earned in India is taxable.
Visa Requirement	No visa needed to	Requires a visa or OCI card to enter

ent	enter India (Indian citizen).	India.
OCI Eligibility	Not applicable (already Indian citizen).	Eligible for Overseas Citizen of India (OCI) status, which grants lifelong visa and multiple entry benefits.
Dual Citizenship	Not allowed. India does not permit dual citizenship .	Retains foreign citizenship but can hold OCI card – a form of “quasi dual citizenship.”
Examples	An Indian software engineer working in the USA but holding an Indian passport.	A US citizen whose parents or grandparents were born in India.

Recent Developments: Cultural Exhibitionism and Its Consequences

Recent events underscore the growing friction between diaspora activism and host-country norms:

- In **Edmonton, Canada**, Deepavali celebrations led to house fires due to fireworks misuse, prompting police warnings.
- In **Australia**, anti-immigrant protests have singled out Indians for perceived cultural excesses such as Ganesh immersion and loud festivities.
- In **North America**, segments of the diaspora have been accused of aligning with India's domestic political agendas

or taking positions that appear to interfere in host politics.

- While most diaspora members continue to integrate peacefully, a **vocal minority's aggressive cultural assertion** – often amplified by social media and transnational nationalism – risks alienating host societies and inviting suspicion.

Legal and Diplomatic Framework: India's Diaspora Policy

India's engagement with its diaspora is structured through **citizenship and policy mechanisms**:

- **Citizenship (Amendment) Act, 2003**: Introduced **Sections 7A-7D** in the Citizenship Act, 1955, creating the category of **Overseas Citizenship of India (OCI)** – a quasi-citizenship offering lifetime visa-free entry, property rights, and parity with NRIs in economic and educational fields.
- **Merger of PIO and OCI (2015)**: Simplified the system and strengthened India's outreach under the slogan “*dual citizenship in spirit, not in law*.”
- **Diaspora Engagement Platforms**: The **Pravasi Bharatiya Divas, Know India Programme**, and the **India Development Foundation of Overseas Indians (IDF-OI)** aim to deepen diaspora participation in India's growth story.
- However, this outreach must be understood within global constraints. India does not permit **dual citizenship**, but the U.S. and several Western countries do. Yet, **rising fears of foreign interference** – especially after allegations against Russia and China – have made Western states increasingly vigilant about diaspora political

activities.

Global Context: The Fear of Foreign Influence

- Across democracies, the notion of foreign interference has become politically charged.
- The **U.S., Canada, and Australia** are particularly cautious after episodes involving Chinese and Russian influence operations.
- Even **Israel**, once seen as having an exceptional relationship with U.S. domestic politics, now faces bipartisan scrutiny.
- In this climate, any perception that the Indian state is **mobilising its diaspora for political or ideological purposes** could draw similar suspicion. While India is not yet viewed as a threat, **its actions are being noticed** — particularly in relation to diaspora-linked lobbying, cultural demonstrations, and digital influence.

The Limits of Cultural Nationalism Abroad

Cultural nationalism can strengthen identity and pride but faces inherent limits when exported abroad:

- **Diverse Diaspora Composition:** The Indian diaspora is not homogeneous — it includes Hindus, Muslims, Sikhs, Christians, and people of various linguistic and caste backgrounds. A singular narrative of “Hindu cultural nationalism” risks alienating large sections of this global community.
- **Host-Country Sensitivities:** Many Western democracies prize secularism and multicultural harmony. Overzealous cultural expression — such as loud festivities or public religious processions

— may be viewed as disruptive or even threatening.

- **Diplomatic Repercussions:** When diaspora actions spill into local conflicts or protests, they can strain bilateral relations. For instance, the **Khalistan issue in Canada** and **ethnic tensions in Australia** have tested India’s diplomatic equilibrium.
- **Erosion of Soft Power:** India’s soft power — rooted in its civilisational pluralism and democratic ethos — may erode if diaspora-linked nationalism appears exclusionary or politically aggressive.

Way Forward

- **Reinforce Universal Values:** India should continue to frame diaspora issues — such as discrimination or racism — as part of a **universal human rights discourse**, not as ethnocentric grievances.
- **Promote Responsible Cultural Diplomacy:** Encourage diaspora organisations to collaborate with local institutions, ensuring cultural expressions align with local laws and environmental norms.
- **Enhance Soft Power Through Pluralism:** India’s strength lies in its plural ethos — promoting inclusivity, rather than singular cultural nationalism, will sustain its positive global image.
- **Institutional Mechanisms:** Strengthen the **MEA’s Overseas Indian Affairs Division** to monitor diaspora relations, coordinate with embassies, and preempt potential controversies.

Conclusion:

- India’s diaspora remains a formidable bridge between the nation and the world — an asset of economic might, cultural

depth, and political influence. Yet, **diaspora diplomacy must walk a fine line**: promoting pride without provoking hostility, asserting identity without alienating others, and remaining loyal to both the homeland's heritage and the host land's laws.

Trump-Xi Bonhomie and the "G-2" Reference: Implications for India and the Quad

Source: The Hindu

UPSC Relevance: GS2 International Relations

Context: US China relations and impact on India

Why in News?

The Trump–Xi summit in Busan revived the idea of a U.S.–China "G-2" partnership, raising concerns about its impact on India's trade position and the future of the Quad in the Indo-Pacific.

Introduction

- The recent **U.S.–China summit in Busan, South Korea (October 30, 2025)**, between President **Donald Trump** and President **Xi Jinping**, has generated significant geopolitical ripples across Asia, particularly for India and the Quad grouping (India, the U.S., Japan, and Australia).
- The meeting, held on the sidelines of the **Asia-Pacific Economic Cooperation (APEC)** summit, resulted in a temporary thaw in U.S.–China economic relations and the revival of an old concept – the "G-2", or a strategic condominium between the two largest global powers.

Key Outcomes of the Trump–Xi Summit

- **Tariff Truce:** The U.S. agreed to **reduce**

tariffs on Chinese imports to 47%, establishing a **one-year truce** on trade tariffs and export restrictions on **rare earth minerals**. As a result, **India and Brazil now face the highest tariffs at 50%**, creating competitive disadvantages in global trade.

- **Revival of the "G-2" Concept:** President Trump referred to the U.S. and China as the "G-2", emphasizing their shared global responsibilities as the world's two leading economies. This terminology, absent from official discourse since 2009, suggests a potential strategic alignment or power-sharing arrangement between Washington and Beijing.
- **Proposed High-Level Engagements:** Trump announced plans to **visit China in April 2026** and **host Xi Jinping in the U.S.** later that year – signaling sustained bilateral engagement. Conversely, the **Quad Summit** in India, earlier planned for 2025, now appears unlikely to take place this year.



(Image Source: The Hindu)

Historical Context: The G-2 Idea

- The "**G-2**" concept first emerged during the **Obama–Hu Jintao** summit in 2009. It proposed a **U.S.–China partnership to manage global challenges** like trade, climate change, and nuclear non-proliferation.
- However, the idea was **never institutionalized**, as subsequent years

witnessed **growing U.S.-China rivalry**, leading to the “Pivot to Asia” strategy and later the **Indo-Pacific and Quad frameworks** to balance China’s rise.

- The recent revival of the term by President Trump thus signals a possible **policy reorientation** – from strategic competition to conditional cooperation.

India’s Response

- The **Ministry of External Affairs (MEA)** has maintained a **non-committal stance**, with spokesperson **Randhir Jaiswal** stating that India is still “examining the implications” of the summit.
- This cautious reaction reflects India’s need to **balance its strategic autonomy** while assessing the evolving contours of U.S.-China engagement.

Implications for India

1. Economic and Trade Implications

- The U.S. decision to **reduce tariffs on China** but retain **high tariffs (50%) on India and Brazil** could **undermine India’s export competitiveness**, particularly in manufacturing and technology sectors.
- India’s ongoing **trade negotiations** with the U.S. remain unresolved, including the **retaliatory tariffs (25%)** and an **additional 25% levy** linked to oil imports from Russia.
- This asymmetry could strain India-U.S. trade relations and compel India to **diversify export destinations** and deepen **South-South cooperation**.

2. Strategic and Security Implications

- The reemergence of a **U.S.-China understanding** may **dilute the strategic rationale of the Quad** – which was originally conceived to ensure a “**free, open, and rules-based Indo-Pacific**”.

- If the U.S. begins to accommodate China’s regional ambitions, it may **reduce its commitment to Indo-Pacific coalitions** and **undermine India’s role** as a key balancing power in Asia.

3. Diplomatic and Geopolitical Concerns

- India’s foreign policy rests on the idea of a **multipolar world order**, not a **bipolar arrangement** dominated by two superpowers.
- A G-2 framework could **redefine global decision-making** into spheres of influence, marginalizing emerging powers like India.
- Such a shift would challenge India’s **strategic autonomy**, a core principle of its external engagement since the Non-Aligned Movement.

4. Regional Balance of Power

- A U.S.-China entente could **reshape Asian geopolitics**, with Beijing potentially gaining greater leverage in **South China Sea disputes**, **Taiwan policy**, and **influence over ASEAN**.
- For India, this could mean **reduced U.S. support** in border tensions with China and a **weakened strategic deterrence posture** along the Himalayan frontier.

Implications for the Quad

- The Quad’s strength lies in **shared democratic values** and a **collective commitment to regional security**, maritime freedom, and supply chain resilience.
However, Trump’s renewed outreach to China and **postponement of the 2025 Quad Summit in India** raises concerns that:
- **U.S. strategic focus** could shift away from the Indo-Pacific.
- The Quad’s agenda might be **overshadowed by G-2 diplomacy**.

- **Internal cohesion** among Quad members could weaken if U.S.-China ties improve while Beijing continues to pressure India and Japan regionally.

Way Forward for India

- **Reinforce Strategic Autonomy:** India must continue to pursue an **independent foreign policy**, engaging both the U.S. and China pragmatically without aligning with any one bloc.
- **Deepen Partnerships Beyond the U.S.:** Strengthen ties with **Japan, Australia, the EU, ASEAN**, and the **Global South** to ensure strategic balance and economic resilience.
- **Accelerate Trade Diplomacy:** Revive negotiations for a **bilateral trade deal with the U.S.**, explore **new FTAs**, and leverage platforms like **IPEF (Indo-Pacific Economic Framework)** to safeguard market access.
- **Strengthen the Quad's Relevance:** India should encourage other Quad members to sustain joint initiatives in **defence cooperation, technology, critical minerals, and infrastructure**, even if U.S.-China relations temporarily improve.
-

Engage China Constructively but Cautiously: Maintain diplomatic channels with Beijing, but remain vigilant regarding **border security, regional influence, and technological dependencies**.

Conclusion:

- The **Trump-Xi bonhomie** and the **resurrection of the "G-2" narrative** mark a potentially transformative moment in global geopolitics.
- For India, this development presents both **challenges and opportunities** – demanding strategic prudence, diversified partnerships, and a reaffirmation of its **vision for a multipolar, rules-based Indo-Pacific order**.
- India's diplomatic task ahead lies in ensuring that the **G-2 revival does not translate into a G-minus-one** scenario where its own strategic space is constrained.



ECONOMY

India's Power Sector: Record Renewable Growth but Rising Thermal Push

Source: Down To Earth

UPSC Relevance: GS3 Economy

Context: India's Power Sector

Why in News?

In Q1 FY26, India's power sector saw record renewable additions of 4.6 GW alongside a 1.9 GW thermal capacity increase, reflecting a dual-track approach of clean energy growth and energy security.



(Image Source: Down To Earth)

Introduction

- India's power sector entered FY26 with **one of its strongest quarters of renewable energy expansion**, even as **thermal power capacity also rose**, reflecting the country's **dual-track strategy of rapid growth and gradual decarbonisation**.
- The quarter highlighted the country's commitment to achieving clean energy targets while ensuring energy security amid rising electricity demand.

Record Renewable Energy Additions

- According to the *PowerPulse Q1 FY26* report by the **Institute for Energy Economics and Financial Analysis (IEEFA)**, listed power companies collectively added **4.6 GW of renewable capacity** in the quarter (April-June 2025).
- NTPC** recorded its *best-ever quarter*, commissioning **2,716 MW of renewables**, taking its green portfolio close to **12 GW**.
- Adani Green Energy** added **1.6 GW**, expanding its operating base to **15.8 GW**, a **45% YoY increase**.
- JSW Energy** added **1.9 GW**, supported by the acquisition of O2 Power.
- Suzlon** recorded its *highest first-quarter execution in 30 years* at **444 MW**, pushing its wind order book beyond **5.7 GW**.
- Tata Power and ReNew Energy** advanced domestic solar manufacturing with **1.8 GW of modules and cells** produced in Q1, while Tata Power installed **45,500 rooftop systems**, signalling growing distributed demand.
- This strong renewable momentum underscores India's **accelerating shift toward clean energy**, supported by domestic manufacturing and rooftop adoption.

Thermal Push amid Rising Power Demand

- Despite record renewable growth, **thermal capacity additions stood at 1.9 GW** in Q1 FY26 as **electricity demand surged to a peak of 242 GW** in June 2025.

- The **Union Ministry of Power** directed *imported coal plants to operate at full capacity* and brought *gas-fired plants online* to address peak demand pressures.
- The government also **revised its 2032 thermal expansion target to 95 GW**, up from 80 GW earlier, to ensure **baseload reliability** as renewable capacity grows.
- This reveals India's **energy security imperative**, highlighting the challenge of reducing coal dependence while maintaining uninterrupted supply during peak loads.

Financial Performance and Market Dynamics

- The power sector's expansion was accompanied by **strong financial performance**:
- **SBI** led the sector with a **net income of ₹216.3 billion**, followed by **PFC (₹89.8 billion)** and **Coal India (₹87.3 billion)**.
- Among power producers, **NTPC earned ₹61.1 billion**, while **Adani Power posted ₹33.1 billion**.
- **JSW Energy** and **ReNew Energy** witnessed **sharp revenue growth—79% and 70% YoY**, respectively.
- In contrast, **Borosil Renewables** slipped into a loss after its German arm filed for insolvency due to weak European demand—an indicator of global market vulnerabilities.

Policy Backdrop: Balancing Growth and Decarbonisation

- The quarter was shaped by **policy interventions aimed at both expanding green energy and safeguarding supply security**:
- The **Viability Gap Funding (VGF)** scheme was announced to support 30 GWh of battery storage projects across

15 states.

- **Pumped hydro capacity targets were scaled to 50 GW within six years**, a critical step to address renewable intermittency.
- Regulators approved **electricity futures trading on MCX and NSE**, recognised **Virtual Power Purchase Agreements (PPAs)**, and announced **market coupling in the Day-Ahead Market from January 2026**.
- These policy measures highlight the government's intent to **accelerate renewable integration** while leveraging **financial and market reforms** to attract investment.

Transmission and Financing Momentum

- Strengthening the grid and financing the transition remained central:
- **Adani Energy Solutions** expanded its under-construction transmission order book to **₹593 billion**, while **PowerGrid** ramped up capex to **₹69.8 billion**.
- **India Grid Trust** added **300 MW of solar**, **276 circuit km of transmission**, and won its *first major battery storage project*.
- **IREDA** increased its loan book by **26% YoY**, lending **₹20 billion to renewables** in Q1, while **PFC's loan book reached ₹5.5 trillion**.
- These developments demonstrate that **transmission networks and green financing** are becoming as crucial as generation for India's power transition.

Decarbonisation Efforts and ESG Leadership

Major companies intensified their **environmental, social, and governance (ESG)** initiatives:

- **ReNew Energy** reduced its **Scope 1 and 2 emissions by 18% in FY25**, surpassing

its target.

- NTPC expanded **biomass co-firing** and launched a **green hydrogen hub** in **Andhra Pradesh**.
- **Tata Power** reported that **44% of its portfolio is clean energy**, while **Adani Energy Solutions** aims for **70% renewable share by 2030**.
- These initiatives reflect the **industry-wide shift toward decarbonisation**, aligning with India's net-zero ambitions by 2070.

Challenges and the Road Ahead

- India's Q1 FY26 performance shows a **complex energy transition**: aggressive renewable expansion on one hand and **continued coal reliance for reliability** on the other. With **electricity demand projected to double by 2032** and **installed capacity expected to exceed 1,000 GW**, analysts estimate an investment need of **over US\$500 billion** across **generation, transmission, and storage**.
- According to Shantanu Srivastava of IEEFA, *"India is investing heavily in clean energy capacity and grid stability, but demand security means coal remains a safety net."*

Conclusion:

- The first quarter of FY26 marks a **pivotal moment in India's power sector**, exemplifying its **dual-track approach of growth and decarbonisation**.

Changing the Frame: On India, Forecasting and Natural Events

Source: Down To Earth

UPSC Relevance: GS3 Economy

Context: India's Power Sector

Why in News?

India's 2025 monsoon saw 8% above-normal rainfall, boosting agriculture but causing severe floods and landslides, highlighting the need to integrate accurate forecasts with disaster preparedness.

Introduction

- India's 2025 monsoon season witnessed **8% above-normal rainfall**, leading to higher crop sowing and improved reservoir storage.
- Yet, the season also saw **devastating floods, landslides, and erosion**, particularly in **Himachal Pradesh, Jammu & Kashmir, Punjab**, and parts of the **southern peninsula**.
- The editorial highlights that while IMD's seasonal forecasts were largely accurate, the response to excessive rainfall remained inadequate, revealing gaps in **disaster preparedness and risk communication**.

Monsoon 2025: Key Data

- **Overall rainfall:** 8% above normal (LPA: 87 cm).
- **Regional excess:**
 - Northwest India: **27% above average**
 - Central India: **15% above average**
 - South Peninsula: **10% above average**
- **Agricultural impact:**
 - **Kharif sown area:** ↑ by 15 lakh ha to 1,110 lakh ha
 - **Rice cultivation:** ↑ by 8.45 lakh ha to 438 lakh ha
 - **Reservoir storage:** ↑ to 163 BCM (from 157.8 BCM last year).
- **Extreme events:** Cloudbursts (reported, but often misclassified), urban flooding, landslides, river breaches.

The Core Argument

India often perceives **excess rainfall as a boon**, focusing on agricultural and hydrological benefits. This mindset results in:

- **Under-preparedness** for extreme rainfall events and associated disasters.
- **Framing errors** where “normal” or “above-normal” rainfall is assumed to be harmless.
- **Reactive rather than proactive** disaster management.
- The editorial argues for “**changing the frame**” -shifting the national narrative to treat **excess rainfall with the same seriousness as drought**.



(Image Source: Down To Earth)

Significance of Accurate Forecasting

The **India Meteorological Department (IMD)** has improved **short- and long-range forecasting** due to advancements in:

- High-resolution numerical weather models,
- Doppler weather radars,
- Satellite observations, and
- Ensemble forecasting techniques.
- However, **forecast accuracy alone does not reduce vulnerability**. The real challenge lies in **preparedness, dissemination, and response**.
- *Forecasting success is meaningful only when it translates into reduced loss of lives, livelihoods, and infrastructure.*

Gaps Highlighted

- **Inadequate disaster readiness**

- Flood management plans remain **static and outdated**.
- Infrastructure (drainage, embankments, slope stabilization) is **not climate-resilient**.
- **Communication & framing issues**
 - Terms like “cloudburst” or “normal rainfall” **mislead the public and local authorities**.
 - Media reporting sometimes **sensationalises or misclassifies events**.
- **Reactive governance**
 - Drought warnings trigger emergency measures, but excess rain is not met with similar urgency.
- **Urban vulnerability**
 - Encroachment of floodplains, poor stormwater management, and unregulated construction in hill regions exacerbate risks.

Case Study: Misuse of the Term ‘Cloudburst’

- **Cloudburst (IMD definition):** ≥100 mm rainfall in an hour over a small area (~20–30 sq. km).
- Many state reports wrongly classified heavy rainfall events as “cloudbursts”, creating:
- **Public confusion,**
- Misperception of such events as **rare and unavoidable,**
- Lack of accountability for **infrastructure and planning failures**.

Why Framing Matters

- **Droughts - framed as crises - proactive mitigation.**
- **Excess rain - framed as ‘nature’s bounty’ - complacency.**
- Framing influences:
- **Budgetary allocations** for disaster management,

- **Public risk perception** and community preparedness,
- **Policy prioritisation** (drought-proofing gets precedence over flood-proofing).
- *Treating extreme rainfall as an inevitable natural disaster absolves authorities of responsibility for damages that are often preventable.*

Policy Imperatives

To change the narrative, India must **integrate forecasting with proactive risk reduction measures**:

1. Disaster Preparedness

- Develop **dynamic floodplain zoning maps** and **real-time river monitoring**.
- Strengthen **early warning dissemination systems** (SMS alerts in regional languages, AI-based localised alerts).
- Ensure **community-level preparedness drills**.

2. Urban & Rural Resilience

- Redesign **urban drainage networks** to handle intense rainfall.
- Promote **nature-based solutions**: restoring wetlands, river buffers, and vegetation on slopes.
- Modernise **reservoir operations** to balance flood control with storage needs.

3. Forecast-Driven Agriculture

- Disseminate **rainfall advisories** to farmers for sowing, irrigation, and crop choice.
- Expand **crop insurance coverage** linked to weather forecasts.

4. Data & Governance Reforms

- Establish **integrated river basin authorities** for coordinated flood management.
- Improve **data-sharing** among IMD, Central Water Commission, NDMA, and state agencies.

- Regularly **audit infrastructure vulnerability** (roads, bridges, hydropower plants).

5. Framing & Communication

- **Standardise meteorological terminology** to avoid misclassification.
- Include **forecast interpretation training** for local administrators and journalists.
- Shift the **policy mindset** from relief to risk prevention.

Government Initiatives So Far

- **National Monsoon Mission (NMM)** and **High-Performance Computing (HPC)** for improved forecasts.
- **Flash Flood Guidance Services (FFGS)** for 30,000+ watersheds.
- **National Disaster Management Plan 2019** for flood resilience.
- **Dam Rehabilitation and Improvement Project (DRIP)** to enhance dam safety.
- **Gaps remain in local implementation and infrastructure resilience.**

Way Forward

- India needs a **paradigm shift**:
- **Forecast - Actionable Early Warning - Community Resilience.**
- Recognise that **climate variability will make excess rainfall events more frequent.**
- Institutionalise **'flood preparedness on war-footing'** similar to drought management.

Conclusion:

- India's ability to forecast rainfall has improved significantly, but **preparedness has not kept pace.**
- The **2025 monsoon floods underscore the need to change how we perceive and respond to "above-normal" rainfall.**
- Excess rainfall should no longer be

viewed solely as a **gift for agriculture and reservoirs**, but as a **dual-edged phenomenon** demanding **anticipatory governance**.

- "Forecasts save lives only when governments act before the flood."

Safeguarding India's Digital Economy from Cyber Frauds

Source: The Hindu

UPSC Relevance: GS3 Economy

Context: Digital Economy

Why in News?

India's fast-growing digital economy faces rising cyber frauds such as phishing, UPI/OTP scams, identity theft, and "digital arrests".

Introduction

- India's rapid digital transformation - driven by affordable internet, UPI-led digital banking, and e-commerce -has enhanced **financial inclusion and convenience**.
- However, it has also created new vulnerabilities. Cyber frauds have evolved far beyond simple ATM skimming to sophisticated **phishing, OTP/UPI scams, identity theft, loan scams, and even "digital arrests"**.
- These crimes threaten **citizens' trust in digital platforms**, which is crucial for the success of **Digital India** and for achieving the goal of a **\$1 trillion digital economy by 2030**.
- **Example:** A retired banker in India was recently duped of ₹23 crore through 21 rapid transfers, while another victim lost ₹14 lakh but recovered it due to swift reporting. These cases highlight the importance of **real-time detection and rapid institutional response**.
- **Current Landscape of Cyber Frauds**

- **Social Engineering at the Core:** Fraudsters manipulate **fear, urgency, or greed** to coerce victims into revealing personal information or authorising payments.
- Elderly, rural populations, job-seekers, and digitally illiterate groups are especially vulnerable.
- Many scams rely less on advanced hacking and more on exploiting human psychology.
- **Major Types of Frauds:**
 - **Phishing and Remote Access Scams:** Fake links, emails, or apps used to steal credentials or gain device control.
 - **OTP & UPI Frauds:** Victims unknowingly approve unauthorised transactions.
 - **Identity Theft:** Misuse of Aadhaar, PAN, or banking details for further crimes.
- **Job/Loan Scams:** Target unemployed youth or financially weak individuals.
- **Digital Arrests:** Criminals impersonate police or customs, use fake warrants to extort money.

Patterns in Large-Scale Frauds:

- Unusually **large, rapid, or frequent transactions**.
- **Mule accounts** with incomplete or fake KYC suddenly receiving large inflows.
- **Layering of funds** across multiple accounts in cooperative or smaller banks to evade detection.

Challenges in the Current System

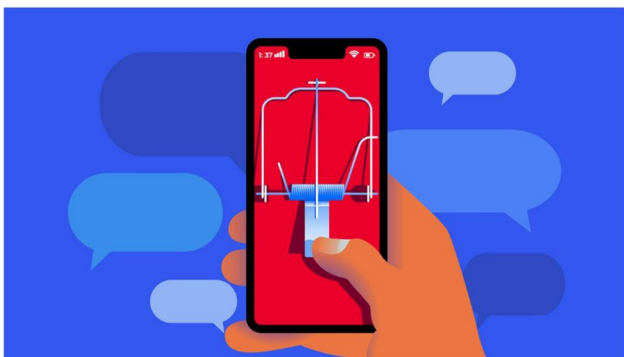
- **Reactive Approach:** Action begins only after a victim files a complaint -often after the crucial **24-hour recovery window** has passed.
- **Institutional Gaps:**
 - Banks issue **generic advisories** but fail to plug KYC loopholes or

monitor anomalies.

- **Customer data breaches** are rampant; leaked data often reaches fraudsters.
- **Cyber police are under-equipped** - lacking trained staff, modern forensic tools, and real-time data-sharing platforms.
- **Erosion of Trust:**
 - Victims often don't report due to **stigma or lack of faith** in redressal systems.
 - Delays and bureaucratic hurdles worsen losses, undermining trust in the digital ecosystem.

Implications for India's Digital Economy

- Rising frauds **undermine financial inclusion** and deter citizens from using digital payments.
- Loss of public confidence can slow down growth in **UPI transactions, fintech adoption, and e-governance** services.
- Fraud-related losses drain **household savings** and can destabilise **financial stability**.
- Internationally, persistent fraud risks damage **India's credibility** as a **secure digital hub** for investment.



(Image Source: The Hindu)

Policy Interventions – A Protection-First Approach

- India needs to transition from a **reactive firefighting model** to a **proactive**

prevention framework, with **citizen safety and trust** at the centre.

1. AI-Driven Fraud Detection

Personalised Transaction Profiles:

- Use **Machine Learning (ML)** to track each customer's normal transaction size, timing, and risk group (e.g., senior citizens, rural users, high-net-worth individuals).
- Unusual activity (e.g., large one-off transfers, multiple debits in a short span) should trigger **automatic alerts or temporary holds**.

Anomaly Detection for Mule Accounts:

- Identify accounts with incomplete/fake KYC or abnormal inflows for immediate action.

Cross-Institutional Monitoring:

- Build a **national fraud-intelligence sharing network** linking banks, payment platforms, telecom operators, and cyber police for **real-time alerts**.

2. Strengthening Banking Safeguards

Tighter KYC & Data Protection:

- Enforce **periodic audits of mule accounts** and penalise negligence in data security.
- Use **Blockchain** for tamper-proof, secure customer data sharing among banks.
- **Transaction Alerts & Verification:**
- Ensure **SMS/email/phone verification for all high-value transfers**.
- Introduce **time-delayed authorisation** for unusually large transactions.

3. Empowering Cyber Police

- **24×7 Rapid-Response Units:**
- Equipped to act **within the 24-hour window** to freeze suspicious accounts.
- Employ **AI-enabled dashboards** for real-time detection and tracing of layered funds.
- **Capacity Building:**
- Enhanced **training, manpower, forensic**

labs, and international cooperation to trace cross-border fraud networks.

4. Victim-Centric Redressal

- **Swift Compensation:**
- As mandated by RBI, victims must receive quick reimbursements without undue blame for technical lapses.
- **Awareness Campaigns:**
- Targeted programmes for **elderly, rural, and digitally naive users** on scam prevention.

Way Forward

- Safeguarding India's digital economy demands **technological innovation backed by strong institutional will**.
- **AI and Blockchain** can transform fraud detection from a **reactive to a predictive system**.
- Banks must **prioritise security over convenience**, closing KYC gaps and ensuring robust transaction monitoring.
- **Cyber police must become technologically agile**, with the ability to act fast and collaborate internationally.
- A **shared fraud-intelligence platform** will allow real-time inter-bank coordination, preventing criminals from exploiting institutional silos.

Conclusion:

- India's ambition of becoming a global digital powerhouse hinge on **trust and resilience**.

Cyber fraud is **not invisible -it is detectable with the right tools**. What is missing is not technology but the **institutional resolve to act promptly and collaboratively**.

Your Capital, Your Right Campaign: A Step towards Financial Inclusion and Empowerment

Source: PIB

UPSC Relevance: GS3- Economy

Context: Your Capital, Your Right Campaign

Why in News?

The Government of India launched the nationwide campaign "Your Capital, Your Right" to help citizens trace and reclaim unclaimed financial assets, enhancing financial inclusion and empowerment.



(Image Source: SMFG India Credit)

Introduction

- India's Union Finance Minister Smt. Nirmala Sitharaman on October 4, 2025, launched the nationwide financial awareness campaign "**Your Capital, Your Right**" in Gandhinagar, Gujarat.
- The initiative reflects the government's commitment to ensuring that the hard-earned savings of citizens are rightfully returned to them or their families, thereby strengthening financial inclusion, trust, and empowerment.

Context and Rationale

- India has a significant volume of unclaimed financial assets – including

bank deposits, unpaid dividends, unclaimed insurance proceeds, mutual fund balances, and pensions. Many of these remain inaccessible due to lack of awareness, incomplete KYC, or procedural hurdles.

According to the **Department of Financial Services (DFS)** (August 2025):

- Over **₹75,000 crore** of unclaimed deposits transferred to the **RBI's Depositor Education and Awareness (DEA) Fund**
- **₹13,800 crore** in unclaimed insurance proceeds
- **₹3,000 crore** in unclaimed mutual fund balances
- Over **₹9,000 crore** in unpaid dividends
- Nearly **172 crore shares** moved to the **Investor Education and Protection Fund (IEPF)**
- These unclaimed savings could otherwise support families' **education, healthcare, and financial security**.

Objectives of the Campaign

- The campaign carries the core message that **"every rupee saved by citizens must return to them or their families."** Its key objectives include:
- **Tracing and Returning Unclaimed Assets:** Helping beneficiaries reclaim what rightfully belongs to them.
- **Financial Awareness:** Educating citizens about how to identify and claim dormant assets.
- **Bridging Trust Gaps:** Strengthening the relationship between citizens and financial institutions.
- **Citizen-Centric Governance:** Ensuring financial inclusion is transparent and accessible.

The 3A's Strategy: Awareness, Accessibility, Action

- The Finance Minister underlined the **"3 A's Strategy"** as the guiding principle:
- **Awareness:** Informing citizens and communities about tracing unclaimed financial assets.
- **Accessibility:** Providing **simplified digital platforms, helpdesks, and district-level outreach** to ease access.
- **Action:** Ensuring **time-bound, transparent, and hassle-free settlement of claims** so that citizens can receive their savings with dignity and confidence.

Implementation Framework

- **Duration:** October – December 2025
- **Coverage:** All **States and Union Territories**
- **Coordination:** Led by **DFS, Ministry of Finance**, in partnership with:
- **RBI – Depositor Education & Awareness Fund**
- **SEBI – Investor protection initiatives**
- **IRDAI – Unclaimed insurance proceeds**
- **PFRDA – Pension claims**
- **IEPFA, banks, mutual funds, and insurance companies**
- **Digital demonstrations and helpdesks** will support citizens in identifying and claiming their assets. Regional Rural Banks like **Gujarat Gramin Bank**, which have played a proactive role in KYC/re-KYC campaigns, are key partners in this drive.

Significance and Interlinkages

(a) Financial Inclusion and Empowerment

- The campaign builds on flagship initiatives such as:
- **Pradhan Mantri Jan Dhan Yojana (PMJDY)** – expanding access to banking
- **UPI and DBT** – improving digital transactions and transparency
- **KYC/Re-KYC drives** – maintaining

active citizen-bank links

- It ensures that inclusion does not end with access to financial services but extends to **reclaiming dormant wealth**.

(b) Economic and Social Impact

- Unlocking over ₹1 lakh crore of unclaimed wealth for households
- Supporting education, healthcare, and small-scale entrepreneurship
- Boosting trust in financial institutions and encouraging formal savings

(c) Good Governance and Ease of Living

- By prioritizing digital tools, citizen awareness, and transparent processes, the campaign reflects citizen-centric governance and contributes to India's Ease of Living Index.

Challenges Ahead

- Awareness gaps in rural and semi-urban areas
- Digital literacy barriers for elderly and marginalised groups
- Coordination across agencies for seamless claim processing
- Fraud prevention while ensuring quick access

Way Forward

- Strengthening digital infrastructure with secure, multilingual platforms
- Capacity building of bank and outreach staff
- Simplifying legal and documentation processes
- Conducting periodic awareness drives to avoid future build-up of unclaimed assets
- Integrating Aadhaar, PAN, and financial accounts to improve traceability

Conclusion:

- The "Your Capital, Your Right"

campaign marks a transformative step in India's financial inclusion journey.

- By returning dormant savings to their rightful owners, the initiative enhances household resilience, strengthens public trust in institutions, and aligns with the vision of inclusive growth.
- Through its 3A's approach — Awareness, Accessibility, and Action — the campaign bridges the gap between citizens and financial systems, reinforcing transparent and citizen-focused governance.

Ensuring Drug Safety in India's Pharma Sector: Zero Tolerance for Poor-Quality Medicines

Source: The Hindu

UPSC Relevance: GS3- Economy

Context: India's Pharma Sector

Why in News?

Recent deaths of children due to contaminated cough syrup highlight the urgent need for strict enforcement of drug quality norms in India's pharmaceutical sector.

Introduction

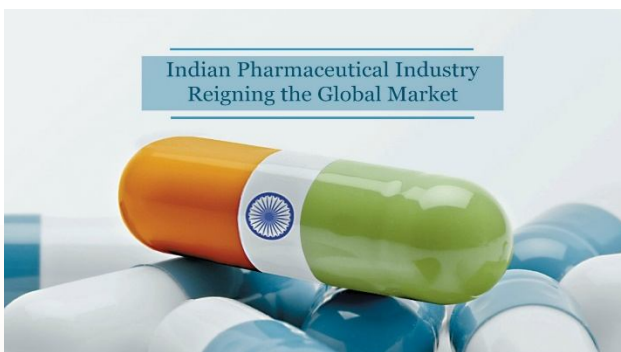
- India's pharmaceutical industry is often called the "**pharmacy of the world**", supplying affordable generics and life-saving medicines to over **200 countries**, including vaccines and antiretroviral drugs.
- However, recent **cough syrup-related deaths** in India and abroad have **shaken global trust** in India's drug quality standards.
- A recent case where **Coldrif cough syrup** manufactured by a private firm was found contaminated with **diethylene glycol (DEG)**, a toxic substance that

caused the death of at least **16 children in Rajasthan and Madhya Pradesh**.

- The Union Health Ministry, after initial denial, has demanded strict compliance with **revised Schedule M norms** (relating to **Good Manufacturing Practices (GMPs)**).
- The case underscores **systemic lapses in drug quality control and regulatory oversight**, which threaten the credibility of India's "Atmanirbhar Bharat" ambition in pharmaceuticals.

Context and Background

- **India's Pharma Landscape**
 - **3rd largest by volume, 14th by value globally.**
 - Accounts for **20% of global generic drug supply** and **60% of vaccine demand**.
 - Pharma exports worth **USD 25-27 billion annually**.
- **Previous Controversies**
- India's drug quality issues are not new:
 - **2022:** Over 60 child deaths in Gambia linked to DEG-contaminated syrups from an Indian manufacturer.
 - **2023:** Similar incident in Uzbekistan (at least 18 deaths).
 - **2025:** Coldrif syrup deaths in India (Rajasthan, Madhya Pradesh).
- These tragedies reveal **recurrent lapses** in manufacturing practices and regulatory enforcement.



(Image Source: Ciron Drugs)

Key Issues

- **Quality Lapses**
 - Detection of **DEG and ethylene glycol** due to use of **non-pharmacopoeial grade propylene glycol** as an excipient.
 - Violations of **Good Manufacturing Practices (GMPs)** and **Good Laboratory Practices (GLPs)**.
 - **Inconsistent test results:** Health Ministry denied DEG presence initially, while Tamil Nadu's lab confirmed it in some batches — showing **coordination failures** among regulators.
- **Weak Regulatory Oversight**
 - Action taken **only after deaths occurred** — indicates **reactive rather than preventive regulation**.
 - Insufficient **surprise inspections** and **batch-wise monitoring**.
 - Gaps in enforcing **Schedule M norms** despite their existence.
- **Accountability Issues**
 - The **manufacturing firm's licence recommended for cancellation**.
 - A **doctor arrested** for unscientific prescription practices.
 - But **systemic accountability** (supply chain checks, state-Central coordination) remains weak.

Implications of Poor-Quality Drugs

- **Public Health**
- Contaminated drugs can cause **acute kidney failure, blindness, neurological damage**, and death — especially in children.
- Increases **antimicrobial resistance (AMR)** due to substandard dosages.
- **Economic and Trade Implications**
- Damages India's reputation as a **trusted global supplier**.
- Risk of **export bans, trade sanctions**, and

loss of international markets.

- **Legal and Ethical Dimensions**
- Violates **Article 21 (Right to Life)** of the Indian Constitution.
- Reflects **ethical lapses in medical and manufacturing practices**.
- **National Image and Atmanirbhar Bharat**
- Quality failures undermine the **"Make in India"** and **Atmanirbhar Bharat** initiatives.
- Weakens India's bid to be a **global hub for affordable healthcare products**.

Government's Response So Far

- **Revised Schedule M norms:** Stricter standards for GMP compliance.
- **CDSCO action:** Recommended cancellation of the manufacturer's licence.
- **State-level investigations:** Tamil Nadu Drugs Control Dept. detected violations.
- **Arrest of the doctor involved in irrational prescriptions.**
- While necessary, these measures are **case-specific and reactive** — lacking a systemic deterrence framework.

Way Forward

- **Zero Tolerance Policy**
 - **"Zero threshold for poor quality drugs"** — strict penalties for all violations, not just those causing deaths.
- **Strengthening Regulatory Framework**
 - **Hawk-like monitoring** through frequent and **unannounced inspections** of manufacturing units.
 - **Batch-wise testing of drugs** by accredited labs before market release.
 - **Single-window digital reporting** system for State and Central regulators to avoid contradictory findings.

- **Capacity Building**
 - Upgrade **testing laboratories** with advanced technology (HPLC, GC-MS, etc.).
 - Train inspectors and auditors in **risk-based assessment**.
- **Legal Reforms**
 - Amend **Drugs and Cosmetics Act, 1940** to impose **stricter criminal liability and fines** on violators.
 - Introduce **product recall obligations** similar to US FDA norms.
- **Transparency and Accountability**
 - Mandatory **public disclosure of test results, violations, and penalties**.
 - Implement a **National Pharmacovigilance Database** to track adverse drug reactions.
- **Supply Chain Management**
 - Ensure **pharmacopoeial grade raw materials** for excipients and APIs.
 - Strengthen **traceability using QR codes/barcodes** to track every batch.

Rail Multi-Tracking Projects Across Four States

Source: The Hindu

UPSC Relevance: GS3- Economy

Context: PM Gati Shakti

Why in News?

THE UNION CABINET APPROVED FOUR RAIL MULTI-TRACKING PROJECTS ACROSS MAHARASHTRA, MADHYA PRADESH, GUJARAT, AND CHHATTISGARH UNDER PM GATI SHAKTI.

Introduction

- Recently the Union Cabinet, chaired by the Prime Minister, approved four multi-tracking projects spanning 18 districts across **Maharashtra, Madhya Pradesh, Gujarat, and Chhattisgarh**, adding

approximately **894 km** to the Indian Railways network.

- The projects, with a total estimated cost of **₹24,634 crore**, are scheduled for completion by **2030-31**.
- These projects are part of the **PM Gati Shakti National Master Plan**, aimed at enhancing integrated and multi-modal connectivity in India.

Background

- **Project Details and Scope**
 - **Wardha-Bhusawal (Maharashtra):**
 - **Track Expansion:** Two-track to four-track
 - **Vadodara-Ratlam (Gujarat-Madhya Pradesh):**
 - **Itarsi-Bhopal-Bina (Madhya Pradesh):**
 - **Gondia-Dongargarh (Maharashtra-Chhattisgarh):**
- **Overall Benefits:**
 - Connectivity to approximately **3,633 villages**
 - Direct benefit to a population of **~85.84 lakh**
 - Enhanced access to **two aspirational districts:** Vidisha and Rajnandgaon
 - Improved connectivity to heritage, tourism, and wildlife destinations like **Sanchi, Satpura Tiger Reserve, Bhimbetka rock shelters, Hazara Falls, and Nawegaon National Park**
- Additional freight traffic capacity of **78 MTPA (million tonnes per annum)**, facilitating movement of coal, cement, fly ash, food grains, and steel

Strategic and Economic Significance

- **Freight and Trade Efficiency:** Multi-tracking reduces congestion on heavily used routes, allowing smoother flow of goods and reducing transit times. The planned routes intersect key industrial

belts and mineral corridors, boosting regional trade.

- **Gati Shakti Alignment:** These projects exemplify the **PM Gati Shakti** vision of integrated infrastructure planning, linking railways, highways, ports, and logistics nodes to reduce logistical costs.
- **Support for Industrial Growth:** Routes like Vadodara-Ratlam and Wardha-Bhusawal serve as arteries for freight-intensive industries, supporting sectors like steel, cement, and power, which are critical to **Make in India** initiatives.



9Image Source: The Hindu)

Socio-Economic Impacts

- **Rural Connectivity:** Expansion benefits over **3,600 villages**, improving access to markets, healthcare, and education. Enhanced rail infrastructure can stimulate rural economies through better mobility.
- **Aspirational District Development:** Vidisha and Rajnandgaon, identified under NITI Aayog's Aspirational District Programme, will experience improved connectivity, which can accelerate local socio-economic development.
- **Tourism Promotion:** Enhanced access to heritage and wildlife destinations supports eco-tourism and heritage tourism, contributing to **employment generation and local income**.

Environmental and Sustainability

Considerations

- While railways are comparatively energy-efficient, the **environmental costs of multi-tracking** need consideration:
- **Land Use Changes:** Acquisition and track laying may impact forests, agricultural lands, and wildlife habitats.
- **Carbon Footprint:** Construction activities may temporarily increase emissions.
- **Mitigation:** Adoption of eco-friendly construction methods, afforestation, and wildlife corridors can reduce negative impacts.
- This also touches upon the **risk of greenwashing**, where the perceived environmental benefits of rail expansion may overshadow the ecological costs if not properly managed.

About the Gati Shakti Scheme

- The PM Gati Shakti scheme seeks to ensure **integrated planning and execution of infrastructure projects** over the next four years, with a focus on accelerating on-ground work, reducing costs, and generating employment. It subsumes the **National Infrastructure Pipeline (NIP) worth ₹110 lakh crore**, launched in 2019.
- Beyond cost savings, the scheme aims to **increase cargo handling capacity, reduce port turnaround times**, and facilitate trade growth.
- It also envisages the development of **11 industrial corridors** and **two new defence corridors** (in Tamil Nadu and Uttar Pradesh), the extension of **4G connectivity to all villages**, and an addition of **17,000 km to the gas pipeline network**.
- The plan contributes to government

targets for 2024-25, such as expanding the **national highway network to 2 lakh km** and establishing over **200 new airports, heliports, and water aerodromes**.

Other Features

- **Integrated Approach:**
 - Gati Shakti seeks to **bring together 16 infrastructure-related ministries**, addressing long-standing issues like fragmented planning, lack of standardisation, delays in approvals, and underutilisation of infrastructure.
- **Gati Shakti Digital Platform:**
 - A **common digital platform** has been proposed for coordinated planning and implementation of infrastructure projects in real time, allowing ministries and departments to collaborate efficiently.
- **Expected Outcomes:**
 - The scheme will facilitate the **mapping of existing and planned connectivity projects**, providing clarity on regional and industrial linkages, especially for **last-mile connectivity**.
 - An integrated transport connectivity strategy will **support Make in India**, improve multimodal transport efficiency, and strengthen India's position as a **global business hub**.
- **Need for Integrated Infrastructure Development:**
 - Currently, there is a significant gap between **macro-level planning and micro-level execution** due to siloed operations and inadequate information sharing across departments.
 - High logistical costs—around **13% of India's GDP**, compared to developed countries—reduce export competitiveness. Quality infrastructure

development is globally recognised as a driver for **sustainable economic growth and large-scale employment generation**.

- The scheme aligns with the **National Monetisation Pipeline (NMP)**, which provides a structured framework for monetising assets and attracting investment.

Challenges and Stress Factors for Indian Railways

- **Congestion on Major Corridors:** Despite multi-tracking, freight-heavy routes may face bottlenecks if capacity expansion is not complemented with modern signalling systems.
- **Maintenance and Operational Costs:** Multi-track lines increase infrastructure complexity and operational expenditure.
- **Integration with Other Transport Modes:** Maximising benefits requires seamless integration with highways, ports, and logistics hubs.

Significance of Recent Development

- **Infrastructure and Economic Development:** Highlights India's policy approach toward improving transport networks and facilitating industrial growth.
- **PM Gati Shakti National Master Plan:** A key scheme for integrated infrastructure, relevant for questions on government initiatives and economic planning.
- **Rural and Regional Development:** Shows how infrastructure projects align with aspirational district development and rural connectivity.
- **Sustainability and Environmental Governance:** Raises questions about balancing development with environmental concerns, a recurrent UPSC theme.

- **Disaster and Logistic Management:** Multi-tracking supports resilient logistics networks, crucial during natural disasters or emergencies.

Conclusion:

- The Cabinet's approval of **multi-tracking projects across Maharashtra, Madhya Pradesh, Gujarat, and Chhattisgarh** is a decisive step toward modernising the Indian Railways and enhancing both freight and passenger capacity.

Modernisation of Financial Architecture and Stablecoins

Source: The Hindu

UPSC Relevance: GS3 Economy

Context: stablecoins

Why in News?

India's Finance Minister Nirmala Sitharaman has highlighted the need for India to be ready to engage with crypto assets such as stablecoins



(Image Source: Padhai. Ai)

Introduction

- The financial landscape globally is witnessing a rapid transformation, driven by digital innovation and blockchain technologies.
- Among the emerging innovations, **stablecoins**—blockchain-based digital assets designed to maintain a stable

value – are gaining prominence.

- Unlike volatile cryptocurrencies, stablecoins are pegged to traditional assets such as fiat currencies, commodities, or crypto assets, offering stability while leveraging blockchain efficiency.
- Until recently, India's stance on stablecoins was cautious, prioritising regulatory clarity and financial stability.
- However, with the global adoption of stablecoins for cross-border payments, remittances, and institutional finance, India is recalibrating its approach.
- Finance Minister **Nirmala Sitharaman** has emphasized the need to engage with crypto assets such as stablecoins, signaling a gradual policy shift.

Understanding Stablecoins

Stablecoins are classified broadly into three types:

- **Fiat-backed stablecoins** – These are pegged to traditional currencies such as USD or Euro and are backed by reserves in regulated institutions. Examples: USDT, USDC.
- **Crypto-backed stablecoins** – These are collateralized by other cryptocurrencies, offering decentralization but with greater volatility. Example: DAI (backed by Ethereum).
- **Algorithmic stablecoins** – Stability is maintained through algorithms adjusting supply and demand, without relying on reserves. Examples include TerraUSD. These are experimental and carry higher risks.
- The key feature of stablecoins is **value stability**, which differentiates them from other Virtual Digital Assets (VDAs). They combine the programmability and transparency of blockchain with the economic reliability of traditional assets.

Global Financial Implications

Stablecoins are redefining traditional financial infrastructures, especially in **cross-border payments**:

- Traditional methods are **slow, costly, and fragmented**, often taking several days with fees averaging \$44 per transaction.
- Stablecoin transactions settle **within seconds** at minimal costs, sometimes as low as \$0.01 per transaction.
- This enables **real-time, programmable payments**, where AI systems could autonomously execute transactions such as subscription renewals or treasury reallocations.
- In global finance, institutional adoption of stablecoins has accelerated. Firms like **BlackRock, Fidelity, and Bank of America** have initiated stablecoin projects.
- Regulatory clarity is also emerging: the **EU's MiCA framework** and the **U.S. GENIUS Act** now provide definitions, reserve standards, and consumer protection measures.
- Thus, stablecoins are **not a replacement of fiat currency** but a **modernisation of financial plumbing**, comprising three layers:
 - **Blockchain Base Layer** – Decentralised, auditable, and interoperable.
 - **Reserve Layer** – Backed by fiat or regulated treasury reserves.
 - **Interface Layer** – Digital wallets, APIs, and payment cards enabling usability in daily transactions.
- Visa and Mastercard integrating stablecoin settlements on Ethereum and Solana exemplify this trend, signaling mainstream financial recalibration.

India's Position and Opportunities

- India has already demonstrated **digital payment leadership** through UPI, Aadhaar, and account aggregator frameworks.
- Stablecoins could extend this leadership by enabling **cross-blockchain and cross-currency interoperability**, potentially creating a **digital financial ecosystem** for real-time payments and remittances.
- **Key opportunities for India:**
 - **Financial inclusion** – Stablecoins can reach unbanked populations in rural and semi-urban areas where traditional banks face challenges.
 - **Cost and efficiency gains** – Reduces remittance costs, accelerates cross-border settlements, and lowers transaction friction.
 - **Global competitiveness** – Positioning India as an early adopter of programmable, interoperable money can enhance its role in global digital finance.
- **Challenges include:**
 - Regulatory clarity around stablecoins and broader crypto-assets.
 - Ensuring **financial stability**, particularly in volatile market conditions.
 - Cybersecurity and fraud risks associated with digital asset transactions.

Blockchain:

- **Blockchain** is a decentralized, immutable, and distributed digital ledger that records transactions across multiple computers in a secure and transparent manner.
- **Key Features of Blockchain**
 1. **Decentralisation** – Data is stored across multiple nodes, reducing reliance on a central authority and

making it less vulnerable to single-point failures.

2. **Immutability** – Once a transaction is recorded, it cannot be altered or deleted, ensuring data integrity.
 3. **Transparency** – Transactions are visible to all participants, promoting accountability.
 4. **Security** – Uses cryptographic algorithms to secure data, making it resistant to hacking.
 5. **Consensus Mechanism** – Transactions are verified by network participants using mechanisms like Proof of Work (PoW) or Proof of Stake (PoS).
- **Types of Blockchains**
 1. **Public Blockchain** – Open to anyone (e.g., Bitcoin, Ethereum).
 2. **Private Blockchain** – Restricted access controlled by a single organisation (e.g., Hyperledger).
 3. **Consortium/Hybrid Blockchain** – Controlled by a group of organisations, offering partial decentralisation.
 - **Applications of Blockchain**
 1. **Cryptocurrencies & Stablecoins** – Blockchain forms the backbone for Bitcoin, Ethereum, and stablecoins.
 2. **Financial Services** – Cross-border payments, smart contracts, and supply chain finance.
 3. **Governance & Public Services** – Land records, voting systems, and identity management.
 4. **Healthcare & Supply Chain** – Ensures data integrity, traceability, and transparency.
 - **Relevance to India**
 - **Digital Finance:** Supports UPI, account aggregators, and emerging

crypto regulations.

- **Financial Inclusion:** Enables low-cost, real-time payments in rural and remote areas.
- **Regulation & Policy:** India is exploring a **central bank digital currency (CBDC)** using blockchain technology for controlled digital money issuance.

Significance

- **Economic Dimension** – They modernize payment systems, reduce transaction costs, and facilitate efficient capital flow.
- **Technological Dimension** – Blockchain enables **transparency, decentralization, and real-time programmable transactions**.
- **Policy and Regulatory Dimension** – India faces the dual challenge of **innovation vs. regulation**. Structured frameworks like MiCA and GENIUS Act globally can serve as references.
- **Global Geopolitics** – As financial architecture evolves, nations that adopt interoperable stablecoins could influence the rules of the new digital economy, potentially challenging the dominance of traditional financial hubs.

Conclusion:

- Stablecoins are at the forefront of **financial modernisation**, bridging the gap between digital assets and traditional fiat currencies. India, with its robust digital infrastructure and proactive regulatory stance, has the potential to leverage stablecoins for enhancing inclusion, efficiency, and global competitiveness.

India must be pragmatic in manufacturing semiconductor chips

Source: Indian Express

UPSC Relevance: GS3 Economy

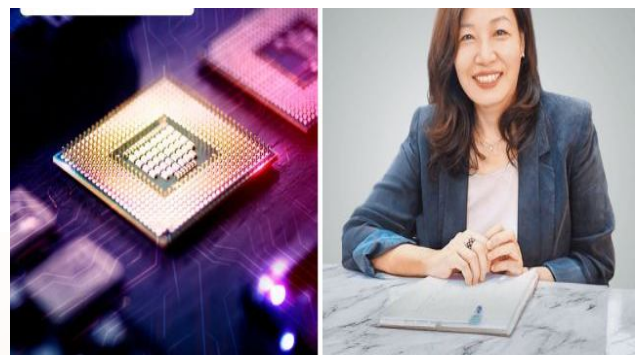
Context: semiconductor chips

Why in News?

US tariffs on Russian oil imports via India highlight the challenges of global trade uncertainty and India's strategic balancing between the West and other powers.

Introduction

- Semiconductor chips are the backbone of modern electronics, forming the core of devices ranging from smartphones to electric vehicles, AI systems, and defense hardware.
- Global geopolitical shifts and technological competition have made semiconductor self-reliance a key strategic priority for nations, including India.
- Recently, Kristy Hsu, Director of Taiwan ASEAN Studies Center, emphasized that India should adopt a pragmatic approach in domestic semiconductor manufacturing by focusing on chips that cater to the local market rather than striving to produce the world's most advanced semiconductors.



(Image Source: Indian Express)

About Semiconductors

- Semiconductors are materials whose electrical conductivity lies between conductors (like copper) and insulators (like glass).
- **Key property:** Their conductivity can be controlled by temperature, impurities (doping), or electric field, making them essential for electronic devices.
- **Common materials:** Silicon (Si), Germanium (Ge), Gallium Arsenide (GaAs).

Types of Semiconductors

1. Intrinsic Semiconductors

- Pure form of semiconductor with no impurities.
- Conductivity depends solely on the material and temperature.
- Example: Pure silicon.

2. Extrinsic Semiconductors

- Doped with impurities to increase conductivity.
- Types:
 - **N-type:** Adds electrons (negative charge carriers).
 - **P-type:** Creates holes (positive charge carriers).
- Used in diodes, transistors, and integrated circuits (ICs).

Importance and Applications

1. **Electronics:** Microchips, processors, memory devices, smartphones, and computers.
2. **Communication:** Used in 5G devices, fiber optics, and telecommunication systems.
3. **Automobiles:** Electric vehicles (EVs), hybrid vehicles, and autonomous driving systems rely heavily on semiconductors.
4. **Defense and Aerospace:** Radars, missiles, satellites, and communication

systems.

5. **Renewable Energy:** Solar panels, power electronics, and energy management systems.
 - Semiconductors are critical for economic growth, defense, and technological

India and Semiconductors

1. Current Scenario

- India imports ~90% of chips used domestically.
- Focus so far has been on chip design, assembly, testing, and packaging rather than cutting-edge fabrication.

2. India Semiconductor Mission (ISM), 2021

- Objective: Create a robust semiconductor and display manufacturing ecosystem.
- Incentives for fabrication plants (fabs), design, and allied industries.
- Focus on mid-tier chips that serve domestic consumption and local industry needs.

3. Opportunities

- Growing electronics market, EVs, solar energy, telecom, and defense sectors.
- Skilled engineering talent available for design and R&D.
- Potential for public-private partnerships and foreign investment.

Current Scenario

1. Global Semiconductor Supply Chain

- Taiwan plays a dominant role in global semiconductor production, particularly in advanced nodes (sub-5nm technologies).
- The U.S.-China trade war and geopolitical tensions have

highlighted vulnerabilities in supply chains. Nations dependent on foreign chips face risks of supply disruption.

- Asian countries, especially India, are exploring ways to participate in the value chain without engaging in ultra-high-end chip manufacturing, which is capital- and technology-intensive.

2. India's Semiconductor Initiatives

- India has launched the **India Semiconductor Mission** with incentives for manufacturing and design capabilities.
- Focus areas include assembly, testing, packaging, and design-linked manufacturing rather than cutting-edge fabrication.
- Engineering talent and a growing electronics market provide India a comparative advantage for mid-range chips serving local demand.

Key Takeaways from Kristy Hsu's Perspective

1. Pragmatism over Ambition

- Nations need not compete in the production of the most advanced chips globally.
- India can focus on chips tailored to its domestic consumption and industrial requirements, including automotive, consumer electronics, and renewable energy sectors.

2. Regional Collaboration

- Asian manufacturers should collaborate to maintain global market access while strengthening regional resilience.
- India can leverage Taiwan's expertise in semiconductor engineering and design for

technology transfer and skill development.

3. Supply Chain Resilience

- Diversification of production and sources is critical to mitigate geopolitical risks.
- A focus on mid-tier semiconductor production can reduce import dependence while ensuring economic viability.

Analytical Perspective

1. Economic Implications

- Developing a semiconductor ecosystem can boost **Make in India**, enhance domestic electronics manufacturing, and generate skilled employment.
- Targeting locally relevant chip production ensures higher ROI and faster market adoption compared to pursuing cutting-edge technologies with uncertain commercial prospects.

2. Strategic Implications

- Reduces India's dependence on global supply chains in sensitive sectors like defense and telecom.
- Aligns with global trends of **regionalization** of semiconductor manufacturing to reduce exposure to geopolitical tensions.

3. Challenges

- Capital and technological intensity of semiconductor production remains high.
- Attracting foreign investment and technology transfer requires consistent policy incentives and a stable regulatory environment.
- Scaling from design to full-scale manufacturing may take several years; India must set realistic milestones.

Way Forward / Policy Recommendations

1. **Focused Strategy**
 - Prioritize **chips with high local demand** (e.g., automotive, 5G devices, consumer electronics).
 - Gradually build capability for higher-end chip manufacturing as ecosystem maturity improves.
2. **Public-Private Partnerships:** Collaborate with global leaders like Taiwan, South Korea, and U.S. firms for technology transfer and joint ventures.
3. **Skill Development:** Develop talent in chip design, packaging, testing, and embedded systems through specialized institutes and industry-academia collaborations.
4. **Incentivization & Infrastructure:** Provide fiscal incentives, ensure land and power availability, and create semiconductor clusters with integrated logistics.
5. **Geopolitical Engagement:** Strengthen ties with key semiconductor nations to ensure India's access to critical technologies and global markets.

Recent Inflation Trends and Policy Implications for the RBI

Source: The Hindu

UPSC Relevance: GS 3 Economy

Context: Inflation Trends

Why in News?

India's retail inflation fell to a 99-month low of 1.54% in September 2025, raising concerns about demand deficiency, monetary policy calibration, and RBI forecast accuracy.

Introduction

- India's retail inflation data for September

2025, recorded at a **99-month low of 1.54%**, marks a significant turning point in the country's macroeconomic landscape.

- This figure, well below the **Reserve Bank of India's (RBI)** medium-term target of **4%**, and even close to the lower bound of its **tolerance band (2%-6%)**, signals a structural moderation in price pressures.
- While low inflation typically benefits consumers, the current situation poses complex policy challenges – particularly regarding **demand deficiency, growth revival, and monetary policy calibration**.

Context: The Current Inflation Scenario

- The **average retail inflation** during the first half of FY 2025-26 stood at **2.2%**, indicating a steady disinflation trend except for August.
- Inflation in key consumption categories such as **clothing and footwear** has dropped to **2.3%**, reflecting weakening consumer demand.
- The overall trend suggests that **supply is outstripping demand**, a situation that can suppress economic growth and private investment.
- Thus, while the RBI successfully tamed inflation after years of monetary tightening, the pendulum has arguably swung too far toward **disinflation or near-deflation**, creating new risks for the economy.

Implications for Monetary Policy

- The RBI's stated objective under its **Flexible Inflation Targeting (FIT)** framework is to maintain inflation at **4% ± 2%**.
- When inflation was persistently high, the central bank emphasized the need to restore it to the 4% midpoint. Now that

inflation is **well below the target**, the same principle of symmetry requires the RBI to stimulate inflation upward—through **monetary accommodation**.



- (Image Source: Money Control)

Inflation

- Inflation is the **sustained rise in the general price level of goods and services in an economy over a period of time**. It reflects the **decline in the purchasing power of money**, meaning that each unit of currency buys fewer goods and services than before.

Types of Inflation

1. Demand-Pull Inflation:

- Occurs when **aggregate demand exceeds aggregate supply**.
- “Too much money chasing too few goods.”
- Example: High consumer spending during festive seasons driving prices up.

2. Cost-Push Inflation:

- Caused by an **increase in the cost of production** (wages, raw materials).
- Example: Rising crude oil prices increase transportation costs, pushing up prices of goods.

3. Structural Inflation:

- Due to **structural bottlenecks in the economy**, such as shortages of key commodities or inefficient supply

chains.

4. Hyperinflation:

- Extremely rapid and uncontrolled price rise, usually exceeding **50% per month**.
- Example: Zimbabwe (2008) or Weimar Germany (1923).

5. Deflation:

- Opposite of inflation; a **sustained decline in the general price level**, often associated with economic slowdown.

Need for Rate Cuts:

- With inflation subdued, the RBI has ample room to **reduce policy rates** in its upcoming **Monetary Policy Committee (MPC)** meeting.
- Lower interest rates can stimulate **credit growth, investment, and consumption**, thereby rebalancing aggregate demand.
- **Shifting from Conservatism to Accommodation:**
- The RBI's cautious stance, shaped by past inflationary pressures, now risks constraining growth.
- Given that inflation expectations are well-anchored, it is preferable to **err on the side of stimulus** rather than restraint.
- **Coordination with Fiscal Policy:**
- The government has already pursued **fiscal measures**—such as **income tax rebates** and **GST rate cuts**—to revive demand.
- However, these have had limited success, as households used additional income to **increase savings or reduce debt** rather than consume more.
- Hence, **monetary easing** must complement fiscal actions to sustain domestic demand.

Demand Deficiency and the Role of the Private Sector

- A prolonged period of low inflation often reflects **insufficient demand relative to supply**. The Indian economy, unlike China, lacks a strong export base to absorb domestic production. Therefore, the onus of recovery lies on **domestic consumption and private investment**.
- The government's attempts to stimulate demand through **tax incentives** provided short-term relief but failed to generate a structural boost in consumption.
- **Private sector wages** have stagnated, limiting purchasing power and aggregate demand.
- Although **private investment announcements** have increased in 2025, their materialization into actual projects is essential for translating intent into growth.
- For sustainable demand recovery, a **rise in real wages**, supported by productivity and employment growth, is crucial. This can help create a **virtuous cycle** of income, consumption, and investment.

The Problem of Forecast Inaccuracy

- A key issue highlighted by the recent inflation data is the **RBI's forecasting error**.
- In **April 2025**, the RBI projected annual inflation at **4%**, consistent with its target.
- However, by **September 2025**, it revised the forecast sharply downward to **2.6%**, a significant correction within just six months.
- Such a large revision raises concerns about the **robustness of the RBI's econometric models** and its ability to anticipate shifts in inflation dynamics.

Why Accurate Forecasting Matters:

- Inflation forecasting guides **monetary policy decisions, interest rate settings, and liquidity management**.
- Errors in prediction can lead to **policy lags, miscalibrated interventions, and reduced credibility** of the central bank.
- Inaccurate forecasts also distort **market expectations** and **business planning**.
- Hence, strengthening the **analytical and modeling capacity** of the RBI, perhaps through enhanced use of **AI-driven forecasting models, real-time data analytics, and sectoral price behavior analysis**, is an urgent institutional need.

Lessons and the Way Forward

The current episode of ultra-low inflation offers several lessons for policymakers:

- **Balanced Inflation Targeting:** The RBI must treat both high and low deviations from the 4% target with equal concern, maintaining **symmetry** in its approach.
- **Monetary-Fiscal Coordination:** The government and RBI should work together to ensure **policy complementarity**—fiscal measures to boost demand, alongside accommodative monetary policy.
- **Focus on Real Economy Linkages:** Inflation management should not be seen in isolation from employment, wages, and productivity. Structural reforms to boost **income and consumption** are essential.
- **Improving Forecast Accuracy:** Upgrading forecasting tools and improving transparency in assumptions will strengthen policy credibility.
- **Encouraging Private Investment:** Timely execution of private investment projects will create jobs, raise wages, and restore the consumption momentum.

necessary for sustained growth.

Conclusion:

- Inflation control is not just about keeping prices low, but about maintaining the right balance between price stability and growth dynamism. The challenge for the RBI now lies not in taming inflation, but in reviving demand without losing credibility.

Solar Industry in India

Source: The Hindu

UPSC Relevance: GS3 Economy, Renewable Energy

Context: Solar Industry in India

Why in News?

India has become the world's third-largest solar power producer, but high domestic module costs and limited exports necessitate exploring new markets like Africa to sustain its solar manufacturing industry.



(Image Source: IBEF)

Introduction

- India's solar energy sector has emerged as one of the most dynamic and transformative components of its renewable energy landscape. Over the past decade, India has made remarkable strides in both the **generation and manufacturing** of solar power.
- However, sustaining this growth and

ensuring long-term competitiveness in the global market requires strategic interventions, particularly as the domestic market faces cost challenges and international competition.

India's Solar Energy Growth Story

- India's solar revolution began in earnest during the mid-2010s, following the sharp decline in the cost of solar power generation. Around **2017**, the **per-unit cost of solar electricity** fell below that of coal, making solar a commercially viable and environmentally sustainable option.
 - By **2024-25**, India had achieved significant milestones:
 - **Generation:** 1,08,494 GWh of solar power, surpassing Japan (96,459 GWh), making India the **third-largest solar energy producer** globally after China and the United States.
 - **Manufacturing capacity:** Solar module manufacturing capacity rose dramatically from **2 GW in 2014** to a projected **100 GW in 2025**, as per the **Ministry of New and Renewable Energy (MNRE)**.
- **Installed capacity:** As of **September 2025**, India's **installed solar capacity** reached **117 GW**, a major contribution to its renewable energy mix.
- However, the **effective production capacity** remains around **85 GW**, indicating the gap between installed capacity and actual operational output.

Climate Commitments and Future Targets

- India's ambitious climate commitments under the **Paris Agreement** and subsequent COP meetings aim to source **50% of its power requirements from non-fossil fuel sources by 2030**, roughly **500 GW** of power capacity.

- Out of this, **250–280 GW** is expected to come from **solar energy** alone.
- To achieve this, India must add **approximately 30 GW annually** till 2030.
- However, the **actual addition** in recent years has been **between 17–23 GW per year**, reflecting a considerable shortfall.

International Solar Alliance (ISA)

- The **International Solar Alliance (ISA)** is a **multilateral treaty-based organization** initiated by India and France in **2015** during the **Paris Climate Summit (COP21)**.
- It aims to promote **solar energy deployment** globally, particularly in countries lying **between the Tropic of Cancer and the Tropic of Capricorn**, which receive abundant sunlight.

Objectives

1. **Promote solar energy use** in member countries.
2. **Mobilize \$1 trillion in investments** by 2030 for solar projects in developing nations.
3. Facilitate **technology transfer** and **research & development** in solar energy.
4. Assist in **capacity building**, including training, skill development, and knowledge sharing.
5. Help member countries achieve **climate goals** and **reduce dependence on fossil fuels**.

Membership

- The ISA is open to **all UN member countries**, but primarily targets **sun-rich nations** in the tropical zone.
- As of 2025, the alliance has **over 120 member countries**.
- India is the **host country**, with the **headquarters in Gurugram, Haryana**.

Key Initiatives

1. **Solar Parks & Rooftop Solar Programs:** Facilitating large-scale solar projects and rooftop solar adoption.
2. **Solar Pumps for Agriculture:** Promoting solar-powered irrigation in rural areas, modeled after India's **PM Kusun scheme**.
3. **Financing & Investment:** Mobilizing funds through member countries, development banks, and private investors.
4. **Technology Collaboration:** Encouraging collaboration in **solar module manufacturing**, storage solutions, and innovative solar technologies.
5. **Global Outreach:** Expanding solar access in Africa, Southeast Asia, and the Pacific Islands.

Challenges in Domestic Solar Manufacturing

While India's internal capacity appears promising on paper, its solar manufacturing ecosystem faces critical structural constraints:

- **High Production Costs:**
- Indian solar modules are **1.5–2 times more expensive** than Chinese modules.
- This is due to **China's economies of scale**, **control over key raw materials** (such as polysilicon), and **superior production technology**.
- **Dependence on Imports:**
- Despite rising domestic capacity, **India imports a large share of components** – including wafers, cells, and inverters – from China and Southeast Asia.
- **Limited Export Competitiveness:**
- India managed to export **around 4 GW** of solar modules to the **U.S. in 2024**, primarily due to temporary U.S. restrictions on Chinese imports.
- In contrast, **China exported around 236**

GW in the same year—illustrating the scale gap.

- **Domestic Demand Constraints:**
- Schemes such as **PM Kusum** (for rural solar pumps) and **PM Surya Ghar** (for rooftop solar systems) have yet to achieve substantial nationwide adoption, limiting the internal demand base.

The Need for External Markets

- Given the potential **supply glut** in the coming years due to new manufacturing capacity, India's solar industry must **look outward for markets**. Without external demand, the large domestic production base could face underutilization.
- In this context, **Africa emerges as a strategic partner:**
 - Africa's **limited electrification**, especially in rural areas, presents a major opportunity for **solar-powered irrigation** and **decentralized energy systems**.
 - The **International Solar Alliance (ISA)**—jointly initiated by India and France—can serve as a diplomatic and institutional platform to **promote India as a reliable solar partner** for African nations.
- India's **PM Kusum** and **PM Surya Ghar models** could be adapted for African conditions to expand access to clean energy and irrigation, boosting both agricultural productivity and India's export prospects.

Strategic Implications

- **Energy Security and Climate Leadership:**
 - Strengthening the solar industry enhances India's **energy independence** and supports its Net

Zero by 2070 goal.

- Becoming a **solar supplier** to the Global South aligns with India's aspiration to be a **leader in climate justice** and **sustainable development**.
- **Economic and Industrial Benefits:**
 - Expanding solar exports would create **new jobs**, enhance **manufacturing competitiveness**, and generate **foreign exchange earnings**.
 - It could also attract **foreign investment** and **technology collaborations** under initiatives such as *Make in India* and *Atmanirbhar Bharat*.
- **Diplomatic Leverage:** Through the ISA and bilateral projects, India can strengthen **South-South cooperation** and **geopolitical influence**, particularly across Africa and Asia-Pacific regions.

Policy Measures Needed

- To sustain and expand its solar growth, India must adopt a mix of **domestic and international strategies:**
 - **Boost R&D and innovation** in solar cell efficiency and energy storage technologies.
 - **Provide targeted subsidies or tax incentives** to make domestic modules more competitive.
 - **Diversify raw material sources** and build domestic capacity in polysilicon, wafers, and cells.
 - **Facilitate export linkages** through the ISA, EXIM Bank financing, and diplomatic missions.
 - **Accelerate domestic adoption** by streamlining rooftop solar approvals, improving grid integration, and enhancing financing for rural and small-scale installations.

Conclusion:

- India's solar story has reached a turning point – from **adoption to leadership**, from **import dependence to export potential**. The challenge now is to translate capacity into competitiveness, and ambition into lasting sustainability.

India's first National Household Income Survey (NHIS)

Source: The Hindu

UPSC Relevance: GS3 Economy

Context: National Household Income Survey (NHIS)

Why in News?

The Ministry of Statistics and Programme Implementation (MoSPI) will conduct India's first-ever *National Household Income Survey (NHIS)* from February 2026 to directly measure household income distribution.

Introduction

- The Ministry of Statistics and Programme Implementation (MoSPI) plans to conduct India's first pan-India **National Household Income Survey (NHIS)** beginning in **February 2026**. MoSPI Secretary **Saurabh Garg** has described it as one of the most challenging surveys undertaken by the ministry.
- Income surveys are globally difficult because people often consider income-related questions sensitive. In a pre-survey test, about **95% of respondents felt uncomfortable** sharing income and tax-related details.
- Therefore, **public awareness, trust, and confidentiality** will be crucial for its success.

Why the Survey Matters

- Fills a Long-standing Data Gap:** India has relied mainly on consumption and expenditure surveys for welfare and poverty estimation. Direct income data will allow better measurement of inequality and middle-class dynamics.
- Improves Targeting and Taxation Policy:** Accurate income data will help design efficient subsidy schemes, evaluate welfare reach, and assess income-tax compliance.
- Strengthens Macroeconomic Planning:** Income data can enhance national accounts, refine poverty lines, and improve CPI and GDP calculations.

Findings from the Pre-test

- Most households found income-related questions "sensitive."
- Around 95% expressed discomfort sharing income and tax details.
- MoSPI identified **awareness generation** and **guaranteed anonymity** as essential for participation.

Methodological Challenges

- Under-reporting and Non-response:** Respondents may refuse or understate income, leading to biased estimates.
- Informal Sector Incomes:** A large informal economy and irregular incomes make accurate reporting difficult.
- Recall Errors:** Many households lack written records or pay slips to recall annual income accurately.
- Tax Evasion Concerns:** People may fear that survey data will be shared with tax authorities.
- Survey Design:** Capturing multiple income sources and high-income outliers requires complex sampling and questionnaire design.

Ethical and Institutional Aspects

- **Anonymity and Data Protection:** Ensuring respondents' privacy and preventing data misuse is essential.
- **Legal Safeguards:** MoSPI must guarantee that data will not be shared with enforcement or tax agencies.
- **Expert Involvement:** Technical Expert Groups are finalizing methodology and best practices for data collection.

Steps to Ensure Success

- **Public Awareness Campaigns:** Clearly explain the purpose and confidentiality of the survey.
- **Training Enumerators:** Enumerators should be sensitized to handle responses respectfully.
- **Modern Data Tools:** Use of digital data collection systems to reduce human error.
- **Sample Design Adjustments:** Oversampling high-income households to capture inequality.
- **Cross-verification:** Carefully combine survey data with administrative records (with consent).

Risks and Limitations

- Persistent **under-reporting** may distort income distribution estimates.
- Public suspicion about misuse could lower participation.
- **Data confidentiality breaches** may erode trust in future surveys.

Conclusion:

- The NHIS represents a milestone in India's data infrastructure, aiming to directly map household income patterns for the first time. Its success depends on **public trust, transparency, and strict data confidentiality**.

Bharat International Rice Conference (BIRC) 2025

Source: PIB

UPSC Relevance: GS3 Agriculture

Context: Bharat International Rice Conference (BIRC) 2025

Why in News?

- The Bharat International Rice Conference (BIRC) 2025 is scheduled to be held at Bharat Mandapam, Pragati Maidan, New Delhi, on 30–31 October 2025.



(Image Source: BIRC.org)

Background

- India regularly engages with private trade bodies and farmer-producer organizations to promote *participatory decision-making* in trade development.
- In this context, the Department of Commerce has extended **non-financial facilitative support** to the upcoming BIRC 2025.
- The event is organized by the **Indian Rice Exporters' Federation (IREF)** – an independent private body representing major rice exporters.
- The government clarified that it plays **no role** in IREF's internal appointments or financial management.

Significance of the Rice Sector

- **Economic weight:** Rice is India's largest

agricultural export commodity, earning US \$ 12.95 billion in FY 2024–25.

- **Global position:** India remains the **largest rice producer** and a leading exporter, catering to both **basmati** and **non-basmati** markets.
- **Livelihoods:** The sector sustains millions of small and marginal farmers and contributes significantly to **rural employment and food security**.
- **Strategic dimension:** Balancing export potential and domestic food buffer stock is vital to India's food-policy equilibrium.

About BIRC 2025

- **Venue:** Bharat Mandapam, Pragati Maidan, New Delhi
- **Dates:** 30–31 October 2025
- **Organiser:** *Indian Rice Exporters' Federation (IREF)*, a private federation of exporters and stakeholders in the rice value chain.
- **Collaborating Associations:**
 - The Rice Exporters Association, Chhattisgarh (TREA-CG)
 - The Rice Exporters Association, Kakinada
 - Other state-level associations representing **non-basmati rice** exporters.
- **Financial Model:** The entire event is **privately financed** – IREF and partners bear costs of venue, logistics, hospitality, and creative arrangements through internal funds or sponsorships.
- **Government's Role:** The **Department of Commerce** and **APEDA** provide institutional and coordination support without financial outlay.

Institutional Role – APEDA's Contribution

► Background of APEDA

- **Full Form:** *Agricultural and Processed Food*

Products Export Development Authority

- **Establishment:** Under the *APEDA Act, 1985* (operative from 13 February 1986)
- **Administrative Control:** *Department of Commerce, Ministry of Commerce & Industry*
- **Headquarters:** New Delhi

► Mandate

APEDA promotes and develops exports of **scheduled agricultural and processed food products** through:

1. Registration and financial assistance to exporters.
2. Infrastructure creation – packhouses, cold-chains, quality-testing labs.
3. Quality certification and compliance (e.g. *National Programme for Organic Production – NPOP*).
4. Branding and marketing of “Brand India” agri-products globally.
5. Support to Farmer Producer Organizations (FPOs) for export readiness.

► Role in BIRC 2025

- **Coordinator:** Facilitates inter-ministerial collaboration (Agriculture, Commerce, External Affairs, Finance) to promote a unified export strategy.
- **Facilitator:** Helps IREF align event themes with India's *Agriculture Export Policy (2018)* and *One District One Product (ODOP)* framework.
- **Non-financial Supporter:** Offers technical inputs, branding support, and international outreach through its trade networks.

Thus, APEDA's involvement ensures that BIRC 2025 strengthens **export competitiveness, quality assurance, and sustainability** in India's rice sector.

CSE's New Report Charts a Roadmap for Climate-Resilient and Sustainable Agriculture

Source: Down To earth

UPSC Relevance: GS 3 Agriculture

Context: Climate-resilient and sustainable agriculture

Why in News?

The Centre for Science and Environment (CSE) released two new reports at a national conclave in Rajasthan outlining a roadmap for making Indian agriculture more climate-resilient and sustainable.

Introduction

- Agriculture lies at the heart of India's economy, employing nearly half of the population and shaping rural livelihoods.
- Yet, it is also among the most **climate-vulnerable sectors**, facing increasing threats from rising temperatures, erratic rainfall, and land degradation. Recognising this dual challenge — that **agriculture is both a victim and a contributor to climate change** — the Centre for Science and Environment (CSE) has released a comprehensive roadmap to make Indian agriculture more **climate-resilient, sustainable, and nutrition-secure**.
- The report, launched during the **National Conclave on Sustainable Food Systems** held at Anil Agarwal Environment Training Institute (AAETI), Nimli, Rajasthan (October 27–29, 2025), highlights how transforming India's food systems is essential for long-term ecological and economic stability.

Context and Background

- In 2018, around 11% of global greenhouse gas (GHG) emissions came from food production systems — including **agriculture, livestock, and pesticide use**.
- Despite this, farmers and livestock rearers remain **among the most vulnerable to climate impacts**, facing declining productivity, soil fertility loss, and water scarcity.
- India's own agricultural landscape reflects this vulnerability:
 - **90% of rural districts** face climate-related risks.
 - **Rain-fed rice yields** may decline by **20% by 2050** and **47% by 2080** without adaptation measures.
 - Rising input costs, poor infrastructure, and extreme weather further compound farmers' distress.
- Against this backdrop, CSE's twin reports — *Sustainable Food Systems: An Agenda for Climate-Risked Times* and *Missing from the Plate: Edible Plants in Wetlands Lose Favour* — provide a policy and ecological framework for strengthening India's food systems.

Key Highlights of the Reports

1. Sustainable Food Systems: An Agenda for Climate-Risked Times

- This flagship report provides a **roadmap for climate-resilient agriculture** in India. It recommends:
- Transitioning to **low-input, ecologically sound farming practices** that reduce dependence on chemical fertilizers and pesticides.

Diversifying crops and livestock to manage risks from climatic variability.

- Promoting **nutrition-rich, locally suited, and traditional crops** such as millets and

pulses.

- Strengthening **carbon markets and soil health monitoring** as tools for sustainability.
- Encouraging **climate-conscious food consumption patterns** among citizens.

2. Missing from the Plate: Edible Plants in Wetlands Lose Favour

- This companion report documents the **diversity of edible wetland plants** across India and their role in food security, nutrition, and climate adaptation.
- It warns that these species are **disappearing from local diets**, leading to a loss of both biodiversity and nutritional value. By restoring traditional food systems, India can simultaneously **enhance resilience, reduce emissions, and preserve cultural heritage**.



(Image Source: geospatial World)

The Food-Climate-Nutrition Nexus

CSE's reports stress that the **food-climate-nutrition connection** is not limited to dietary preferences such as veganism or organic farming. Instead, it is about:

- **How food is grown** — with minimal ecological impact.
- **What we eat** — focusing on nutritional adequacy and diversity.
- **How much we consume** — avoiding waste and overproduction.
- This holistic approach aligns with the **Sustainable Development Goals**

(SDGs) — particularly **SDG 2 (Zero Hunger)**, **SDG 12 (Responsible Consumption and Production)**, and **SDG 13 (Climate Action)**.

Climate-Resilient Agriculture

- **Climate-Resilient Agriculture (CRA)** refers to an integrated approach that helps agricultural systems **prepare for, adapt to, and recover from** the adverse impacts of climate change while ensuring productivity and sustainability.
- According to the **Food and Agriculture Organization (FAO)**, CRA aims to achieve three core objectives:
 - **Sustainably increase agricultural productivity and incomes.**
 - **Adapt and build resilience** to climate change at multiple levels (farm, ecosystem, and community).
 - **Reduce greenhouse gas emissions** where possible.
- In essence, it combines **adaptation** (coping with climate impacts) and **mitigation** (reducing emissions) through improved land, water, and input management practices.

Climate Change and Indian Agriculture

- India's agriculture is highly climate-sensitive due to its **dependence on monsoon rains**, fragmented land holdings, and limited irrigation coverage.
- **90% of rural districts** face climate-related risks.
- **Rain-fed areas**, accounting for **60% of net sown area**, are particularly vulnerable.
- Government data indicate that **rain-fed rice yields** may fall by **20% by 2050** and **47% by 2080** if no adaptation measures are taken.
- Increased frequency of **heatwaves**,

floods, and cyclones disrupts cropping patterns, soil fertility, and rural livelihoods.

- These trends underscore the urgency of adopting climate-resilient strategies at both the policy and grassroots levels.

Key Components of Climate-Resilient Agriculture

Diversified Cropping Systems

- Promoting millets, pulses, and oilseeds that are drought-tolerant and nutrition-rich.
- Reducing monoculture dependency to enhance resilience.

Improved Soil and Water Management

- Conservation tillage, micro-irrigation, and watershed development.
- Organic manure and composting to restore soil carbon and fertility.

Agroforestry and Integrated Farming Systems

- Combining trees, crops, and livestock to improve productivity and ecological balance.

Use of Climate-Smart Technologies

- Weather-based crop advisories, drought-resistant seed varieties, and early warning systems.
- Digital tools for precision farming and insurance.

Institutional and Policy Support

- Strengthening crop insurance (PM Fasal Bima Yojana), soil health cards, and market access.
- Integrating CRA into rural development and national climate policies.

Challenges in Achieving Climate-Resilient Agriculture

- Despite policy initiatives like **National Mission for Sustainable Agriculture**

(NMSA) and **Paramparagat Krishi Vikas Yojana (PKVY)**, several challenges persist:

- **Fragmented policy implementation** across states.
- **Inadequate investment in soil health and irrigation infrastructure.**
- **Lack of integration between agricultural research and climate adaptation strategies.**
- **Limited awareness among farmers** about low-carbon practices.
- Without a coordinated and evidence-based approach, these structural issues may undermine progress toward resilience.

Way Forward

CSE's roadmap provides clear strategic directions:

- **Mainstream agroecological practices** into national and state agricultural policies.
- **Incentivize low-carbon farming** through green credit and carbon markets.
- **Invest in soil health restoration** and decentralized water management.
- **Promote traditional and climate-suited crops**, especially millets, pulses, and oilseeds.
- **Strengthen agricultural extension services** to spread awareness about adaptive technologies.
- **Integrate nutrition goals** into agricultural planning, ensuring dietary diversity and food security.

Conclusion:

- The CSE's reports mark a significant step toward aligning India's agricultural development with climate and nutritional imperatives. By embracing this vision, India can transition toward a

low-carbon, nutrition-sensitive, and climate-resilient agricultural system – ensuring the well-being of both farmers and consumers in an era of growing climate uncertainty.

Global Capital and India's Banking Transformation

Source: Indian Express

UPSC Relevance: GS 3 Economy

Context: Banking Sector Reforms

Why in News?

Global financial giants like Blackstone, Emirates NBD, SMBC, Zurich Insurance, and IHC are making major acquisitions in Indian banks and NBFCs

Background

- India's financial landscape is witnessing a historic transformation. Over the last two years, several global financial giants – including **Blackstone**, **Emirates NBD**, **Sumitomo Mitsui Banking Corporation (SMBC)**, **Zurich Insurance**, and **Abu Dhabi's International Holding Company (IHC)** – have made major investments in Indian banks, insurance firms, and NBFCs.
- Once perceived as over-regulated and inward-looking, India's banking sector is now emerging as one of the most attractive global investment destinations – driven by strong growth potential, regulatory reforms, and digital expansion.

Major Recent Acquisitions

- Blackstone Inc.** – 9.99% stake in *Federal Bank* for ₹6,196 crore.
- Emirates NBD (Dubai)** – \$3 billion acquisition of a 60% stake in *RBL Bank*.

- SMBC (Japan)** – \$1.6 billion investment for a 25% stake in *Yes Bank*.
- Zurich Insurance** – 70% majority stake in *Kotak General Insurance* for \$670 million.
- IHC (Abu Dhabi)** – Nearly \$1 billion investment in *Sammaan Capital* (formerly Indiabulls Housing).
- Bain Capital** – ₹4,385 crore investment for 18% stake in *Manappuram Finance*.
- Fairfax (Canada)** – Allowed majority stake in *CSB Bank* for five years – a rare RBI relaxation beyond the usual 40% foreign cap.
- These moves mark a shift in the global perception of India's financial institutions as dynamic, reform-oriented, and growth-centric.

Why India's Financial Sector is Attracting Global Investors

1. Strong Economic Fundamentals and Growth Potential

- India's economy is projected to grow at **6.8% (RBI)**, powered by strong domestic demand and digital integration.
- With **400+ million underbanked citizens**, the scope for financial expansion is enormous.
- Rising income levels and formalisation have widened the financial inclusion base.

2. Sectoral Clean-up and Improved Governance

- Post-crisis reforms (after IL&FS, DHFL, and Yes Bank collapses) have strengthened financial discipline.
- Implementation of the **Insolvency and Bankruptcy Code (IBC)**, better asset recognition, and tighter supervision have restored investor confidence.

3. Regulatory Liberalisation

- FDI cap increased to 100% in insurance and 74% in private banks** (with

approval).

- This signals a shift toward openness while maintaining regulatory sovereignty.
- **4. Attractive Valuations and Ready Infrastructure**
- Acquiring stakes gives investors immediate access to **digital platforms, retail networks, and large customer bases**.
- Compared to other emerging markets, Indian banks offer **cost-efficient entry points** with long-term growth prospects.

5. Global Context: India as a Safe Bet

- In contrast to China's tightening markets and geopolitical risks, India provides **macroeconomic stability, political continuity, and rising consumption** – making it a preferred global investment hub.

Performance and Potential of India's Banking Industry

According to McKinsey & Company (2024):

- Indian banks earned **\$46 billion in net income**, a **31% year-on-year growth**.
- India now outpaces global peers in **profitability, liquidity, and capital adequacy**.
- **Key Strengths:**
- High **capital adequacy ratio** and low external vulnerability.
- Growth driven by **secured retail lending**.
- Deepening formalisation through **GST** and **digital payments ecosystem**.

Risks and Concerns

- While foreign capital enhances capacity and innovation, it also brings structural challenges.

1. Strategic Control and Sovereignty Issues

- Majority foreign ownership could shift

decision-making power offshore, especially during crises.

- Strategic objectives may not always align with national priorities.

2. Exposure to Global Financial Shocks

- High foreign participation could make India's system more sensitive to **global interest rate changes, liquidity crunches, or trade disruptions**.

3. Unequal Playing Field

- Foreign banks may enjoy **cheaper global credit** and advanced risk management tools, potentially marginalising domestic lenders that face higher capital costs.

4. Regulatory Vigilance

- With increasing complexity in cross-border ownership, the **RBI and SEBI** need to constantly refine frameworks for **fit-and-proper norms, transparency, and capital adequacy**.



(Image Source: Indian Express)

Implications for India's Financial Future

India's vision of becoming a **\$7 trillion economy by early 2030** demands deep financial capacity and capital inflow. Foreign investments offer not only funds but also **technological expertise and governance best practices**.

- However, India must:
- Preserve **financial sovereignty**.
- Prevent **market concentration** by foreign entities.
- Maintain **inclusive financial access** for small borrowers and rural sectors.

- **For investors:** India offers scale, digital readiness, and policy stability. **For India:** The challenge lies in ensuring that global participation complements – not compromises – its developmental priorities.

Conclusion:

- The surge of global acquisitions in India's financial sector reflects **international confidence** in India's growth trajectory and regulatory maturity.
- Yet, as India integrates deeper with global finance, **calibrated liberalisation** and **robust supervision** will be critical to safeguard systemic stability.
- In essence, India stands at a **strategic crossroads** – embracing global capital to accelerate growth, while ensuring that its **financial independence**, **inclusion goals**, and **long-term resilience** remain uncompromised.

Himachal Pradesh Records Higher HDI Than National Average

Source: The Hindu

UPSC Relevance: GS3 Economy

Context: Human Development Report 2025.

Why in News?

Himachal Pradesh recorded a Human Development Index (HDI) of 0.78, higher than the national average of 0.63, according to the *Human Development Report 2025*.

Introduction

- The *Himachal Pradesh Human Development Report 2025*, released by Chief Minister **Sukhvinder Singh**

Sukhu in Chandigarh, highlights the State's remarkable progress in human development despite its challenging geographical and climatic conditions.

- The report, prepared in collaboration with the **United Nations Development Programme (UNDP)**, presents Himachal Pradesh as a model of resilience, sustainability, and inclusive growth.



(Image Source: Amar Ujala)

Key Findings of the Report

1. Human Development Index (HDI)

- The **average HDI of Himachal Pradesh** stands at **0.78**, significantly higher than the **national average of 0.63**.
- This reflects the State's success in enhancing living standards, literacy, and life expectancy – three core components of HDI.

2. Literacy and Education

- Himachal Pradesh has achieved the distinction of becoming a **fully literate state**, with a **literacy rate of 99.3%**.
- The State ranks **fifth nationally in reading and writing competencies**, a remarkable improvement from **21st position in 2021**.
- These achievements underscore effective educational investments and the expansion of school infrastructure, especially in rural and hilly regions.

3. Health and Life Expectancy

- The **infant mortality rate (IMR)** has

dropped to **21 per 1,000 live births**, indicating a robust primary healthcare system.

- **Life expectancy** has risen to **72 years**, a key indicator of improved nutrition, healthcare accessibility, and sanitation.
- Continuous investments in healthcare, women's welfare, and elderly care have strengthened the State's social infrastructure.

4. Poverty Reduction

- The **poverty rate** in the State has fallen **below 7%**, reflecting the impact of targeted welfare schemes, rural development initiatives, and self-employment programmes.
- Himachal's focus on equitable growth has ensured that development benefits reach remote and tribal areas.

Human Development Index (HDI)

The **Human Development Index (HDI)** is a **composite measure** developed by the **United Nations Development Programme (UNDP)** to assess a country's overall achievement in three basic dimensions of human development:

1. **Health** – measured by *life expectancy at birth*
2. **Education** – measured by *mean years of schooling* and *expected years of schooling*
3. **Standard of living** – measured by *Gross National Income (GNI) per capita* (PPP adjusted)

It reflects how people in a country live long, educated, and decent lives rather than focusing only on economic growth.

India's Performance (HDR 2025):

- **India's HDI:** 0.63
- **Global Rank:** 130 out of 193 countries
- **Category:** Medium Human Development
- **Top-ranked country:** Switzerland

Focus on Sustainable and Climate-Resilient Development

- Despite geographical constraints, Himachal Pradesh has maintained a strong commitment to **environment-friendly growth** and **climate resilience**.

1. Climate Change Challenges

- The State faces severe consequences of global warming, including **heavy rainfall, landslides, floods, and cloudbursts** during monsoons.
- These disasters have caused substantial **loss of lives, property, and infrastructure**, emphasizing the urgency for adaptive strategies.

2. Sustainable Development Initiatives

- Himachal Pradesh follows a **sustainable development framework** that balances ecological preservation with economic growth.
- The government has **avoided exploitative use of forests, rivers, and mountains**, ensuring long-term ecological balance.

Innovative Government Schemes for Green Growth

1. Rajiv Gandhi Self-Employment Start-up Scheme

- Launched with an **outlay of ₹680 crore**, the scheme aims to promote **green entrepreneurship** and **self-employment**.
- In its **first phase**, a **50% subsidy** is offered for the purchase of **electric taxis (e-taxis)** to promote sustainable mobility.

2. Rajiv Gandhi Self-Employment Solar Energy Scheme

- Provides **interest subsidies** for establishing **ground-mounted solar projects (100 kW–2 MW)**:
 - **5% subsidy** in **tribal areas**.
 - **4% subsidy** in **non-tribal areas**.

- This scheme encourages local energy generation and employment opportunities in renewable sectors.

3. Electric Vehicle Policy and Green Targets

- Himachal has become the **first hill state to adopt a strong electric vehicle policy**.
- The **goal is to electrify public transport by 2030**, aligning with India's national climate commitments and green mobility agenda.

Conclusion:

- Himachal Pradesh's performance in the *Human Development Report 2025* exemplifies how **socio-economic progress** and **environmental sustainability** can coexist.
- The State's **HDI of 0.78**, high literacy, low poverty, and improved health indicators position it as a **model for inclusive and climate-resilient development** in India.
- Its focus on **human-centric policies, green innovation, and sustainable livelihoods** offers valuable lessons for other Indian states striving to balance growth with ecological preservation.

Vizhinjam Port to Host India's First LNG Bunkering Hub

Source: Indian Express

UPSC Relevance: GS 3 Economy

Context: India's First LNG Bunkering Hub

Why in News?

Vizhinjam International Seaport in Kerala is set to become India's first ship-to-ship LNG bunkering facility, marking a major step toward green and sustainable maritime operations.

Background

- In a landmark development for India's

maritime and energy sectors, **Vizhinjam International Seaport** in Kerala is set to become **India's first ship-to-ship Liquefied Natural Gas (LNG) bunkering facility**.

- This initiative not only positions India as a key player in global green shipping but also aligns with international decarbonisation goals set by the **International Maritime Organization (IMO)**.
- The project represents a convergence of technological innovation, environmental responsibility, and strategic economic foresight — strengthening India's ambition to emerge as a sustainable maritime power.



(Image Source: Indian Express)

Background: The Rise of LNG as a Marine Fuel

- Traditional marine fuels such as Heavy Fuel Oil (HFO) and Marine Diesel Oil (MDO) are major sources of **carbon, sulphur, and particulate emissions**, significantly contributing to maritime pollution.
- The **IMO's 2020 Sulphur Cap Regulation** (limiting sulphur content in marine fuels to 0.5%) and its **2050 Decarbonisation Target** (reducing total greenhouse gas emissions by 50% compared to 2008 levels) have pushed nations and shipping companies to adopt cleaner alternatives.

- **LNG (Liquefied Natural Gas)** has emerged as a viable transition fuel – producing **up to 25% less CO₂, 90% less NO_x, and virtually zero SO_x** compared to conventional fuels.
- Establishing an LNG bunkering hub, therefore, is critical for India's transition towards **low-carbon maritime operations**.

About the Project

- The LNG bunkering hub at Vizhinjam is being developed through a **strategic partnership between Adani Vizhinjam Port Private Limited (AVPPL) and Bharat Petroleum Corporation Limited (BPCL)**.
- An MoU was signed during **India Maritime Week 2025 in Mumbai**, formalizing the collaboration. The key stakeholders included senior officials from BPCL and Adani Ports and Special Economic Zone (APSEZ).

Key Features of the Project:

- **Ship-to-Ship LNG Bunkering:** Vizhinjam will enable direct transfer of LNG fuel from one ship to another at sea – a facility previously unavailable in India.
- **Strategic Location:** Located just **10 nautical miles from the East-West international shipping corridor**, Vizhinjam enjoys unparalleled access to one of the busiest maritime trade routes connecting **Europe, the Middle East, and Southeast Asia**.
- **Sustainable Refuelling Infrastructure:** The facility will cater to **international vessels transitioning to LNG fuel**, significantly reducing emissions from ocean-going traffic in the Indian Ocean region.
- **Advanced Operational Standards:**

BPCL will bring its **technical and operational expertise** to ensure **reliability, safety, and efficiency** in line with global benchmarks.

Strategic and Economic Significance

1. Strengthening India's Maritime Competitiveness

- By positioning Vizhinjam as a **global LNG refuelling and transshipment hub**, India enhances its competitiveness within the **Indian Ocean maritime network**. The port's proximity to major sea lanes offers logistical advantages for global shipping operators.

2. Boosting Kerala's Economic Prospects

- The project elevates Kerala's profile as a maritime investment destination. It will generate **high-skilled employment**, attract **foreign vessels and trade**, and promote **ancillary industries** such as ship repair, marine engineering, and logistics.

3. Supporting India's Energy Transition

- The initiative aligns with India's **National Green Hydrogen Mission** and **Panchamrit commitments** under COP26, reinforcing the country's long-term vision for **carbon-neutral energy systems**.

4. Enhancing Strategic Maritime Presence

- Vizhinjam's location at India's southern tip offers access to both **Arabian Sea and Bay of Bengal routes**, reinforcing the nation's **strategic maritime footprint** in the Indo-Pacific region.

Alignment with Global Decarbonisation Goals

- The LNG bunkering facility directly supports the IMO's **Green Shipping Agenda** by:
 - Reducing carbon and particulate

emissions.

- Promoting the use of cleaner fuels among global fleets.
- Setting the stage for future integration with **ammonia** or **hydrogen-based marine fuels**.
- This marks a **paradigm shift** in India's maritime energy strategy – from fossil-fuel dependency to cleaner and sustainable alternatives.

Institutional Collaboration: Adani Ports and BPCL

- **Adani Ports and SEZ (APSEZ):** Through this project, APSEZ reinforces its commitment to developing **next-generation, environmentally responsible ports**. It also underscores the company's vision to create **green, future-ready maritime infrastructure**.
- **Bharat Petroleum Corporation Limited (BPCL):** BPCL contributes its **technical expertise in LNG handling and distribution**, ensuring world-class standards of operational safety and reliability. This partnership also highlights BPCL's role in **India's clean energy transition**.

Future Prospects

- The Vizhinjam port is expected to enter its **next phase of development by November 2025**, which will further expand its **logistics, energy, and bunkering capabilities**. In the coming decade, Vizhinjam could evolve into:
 - A **multi-fuel energy hub** integrating LNG, biofuels, and hydrogen.
 - A **transshipment and green logistics centre** linking India with global trade routes.
 - A **model port** under India's "**Blue Economy Vision**" – balancing economic growth with ecological

sustainability.

Koyla Shakti - Smart Coal Analytics Dashboard

Source: PIB

UPSC Relevance: GS3 Economy

Context: "Koyla Shakti" - Smart Coal Analytics Dashboard (SCAD)

Why in News?

The Ministry of Coal is set to launch "**Koyla Shakti**" - **Smart Coal Analytics Dashboard (SCAD)** to enable real-time, data-driven monitoring and transparency in the coal sector under the Digital India Mission.



.(Image Source: The Samikhsya)

Introduction

- In a landmark move towards digital transformation and data-driven governance, the **Ministry of Coal** is set to launch "**Koyla Shakti**" - **Smart Coal Analytics Dashboard (SCAD)** on **29th October 2025**.
- This initiative marks a crucial step in modernizing India's coal sector through technology-enabled monitoring, transparency, and decision-making.
- The dashboard reflects the government's commitment to integrating **Digital India principles** into resource management and industrial governance.

Background: Coal and the Need for

Digital Reform

- Coal remains the **backbone of India's energy economy**, accounting for around **55-60% of the country's total energy supply** and nearly **70% of electricity generation**. Despite its critical role, the sector has long been challenged by issues such as:
 - Data fragmentation across agencies
 - Delays in logistics and dispatch coordination
 - Lack of real-time monitoring of production and supply
 - Manual reporting errors and inefficiencies
 - Limited transparency in coal allocation and pricing
- The Ministry of Coal has, over the past few years, undertaken several digital initiatives—such as **Uttam App for quality monitoring**, **Mines Surveillance System**, and **Coal Allocation Monitoring System (CAMS)**. The **launch of Koyla Shakti** represents the next major leap—an integrated, analytical platform that will unify all coal-related operations into a **single digital ecosystem**.

About Koyla Shakti – Smart Coal Analytics Dashboard (SCAD)

- Koyla Shakti** is a centralized **digital intelligence platform** designed to collect, integrate, and analyze real-time data from multiple stakeholders in the coal value chain. It aims to create a **unified and transparent operational interface** to monitor production, dispatch, transportation, and supply efficiency.
- Stakeholders Integrated**
 - The dashboard aggregates information from:
 - Coal producing companies** (CIL,

SCCL, and private miners)

- Central Ministries & Departments** – Coal, Railways, Power, Finance, Ports, Shipping & Waterways, and Road Transport & Highways
- State Departments** managing mineral production through **E-khanij** platforms
- Power generation companies** and industrial coal consumers
- Port authorities** and **private coal-handling terminals**
- This integrated framework enables **end-to-end visibility** of the coal supply chain—from mine to end user.

Objectives of Koyla Shakti

- The primary objective of **Koyla Shakti** is to **strengthen operational efficiency, promote transparency, and enable coordination** across the entire coal ecosystem.
- The initiative aligns with the broader goals of **Digital India** and **Atmanirbhar Bharat**, ensuring efficient resource management through digital empowerment.

Key Features of the Dashboard

- Unified Visibility** – Brings all data from diverse sources into a single interactive interface, breaking silos between agencies.
- Real-Time Monitoring** – Enables continuous, live tracking of coal production, dispatch, and logistics.
- Data-Driven Decision Making** – Provides analytical tools for evidence-based policy planning and management.
- Incident Response System** – Issues timely alerts for operational bottlenecks or logistics delays.
- Standardization** – Introduces uniform metrics and formats across departments

for consistent reporting.

- **Operational Efficiency** - Reduces manual processes and human errors through automation.
- **Scalability** - Designed to integrate future datasets and digital platforms.
- **Transparency & Accountability** - Ensures public and inter-departmental visibility of key performance indicators.
- **Policy Planning & Forecasting** - Offers data analytics for demand forecasting, supply planning, and strategic resource allocation.

Significance for Governance and Policy

- **Enhancing Efficiency and Coordination:** The coal supply chain involves multiple actors—miners, railways, ports, and power producers. Koyla Shakti enables **real-time synchronization** among these entities, minimizing delays and improving overall coordination.
- **Data-Driven Governance:** The platform embodies the shift from reactive to **predictive governance**. Policy decisions on production targets, imports, and logistics can now be based on analytical insights rather than retrospective reports.
- **Strengthening Transparency and Accountability:** By providing open access to operational data across departments, the system **reduces information asymmetry** and enhances public trust in coal management.
- **Supporting Energy Security:** Efficient monitoring and dispatch planning ensure steady coal supply to power plants—crucial for India's **energy security** and **industrial stability**.
- **Facilitating Environmental Oversight:** Data integration can eventually extend to **environmental performance metrics**, supporting sustainable mining practices and ESG (Environmental, Social, Governance) compliance.

Alignment with National Missions

1. Digital India Mission

- Koyla Shakti directly contributes to the **Digital India vision** of transforming governance through technology by:
- Enabling digital platforms for transparency
- Promoting inter-agency data integration
- Strengthening accountability through digital reporting

2. Atmanirbhar Bharat

- By modernizing domestic coal governance, India reduces dependence on coal imports, supporting **self-reliance in energy**.

3. Ease of Doing Business

- A seamless digital interface simplifies compliance and reduces delays for both public and private coal operators.

4. Sustainable Development Goals (SDGs)

- The initiative advances SDG 7 (**Affordable and Clean Energy**) and SDG 9 (**Industry, Innovation and Infrastructure**) by enhancing efficiency and sustainability in energy resource management.

Conclusion:

- The **Koyla Shakti Smart Coal Analytics Dashboard** represents a paradigm shift in India's approach to managing its most critical energy resource.
- By fusing **technology, transparency, and efficiency**, the Ministry of Coal aims to establish a **real-time, data-integrated governance model**.

Bridging the Employability Gap through Academia-Industry Partnership in India

Source: The Hindu

UPSC Relevance: GS 3 Economy

Context: Employability gap

Why in News?

India's graduate employability rate remains low at around 42.6%, highlighting a widening gap between academic training and industry requirements

Background

- India today stands at the intersection of two compelling realities: a rapidly expanding pool of educated youth and an economy that is evolving faster than its workforce preparation systems.
- Despite producing millions of graduates each year, only **42.6% of them are considered employable**, according to national employability surveys.
- This statistic is more than a number — it is a mirror reflecting a deep **structural disconnection between higher education and labour market requirements**. If India's demographic dividend is to become a true economic advantage, bridging the gap between academia and industry must be a national priority.

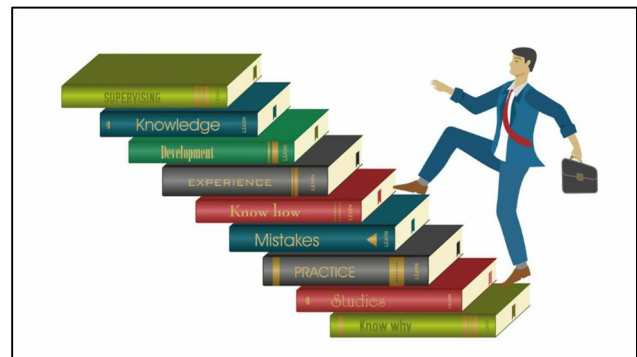
Understanding Employability

- Employability goes beyond mere employment. It refers to the **capability of an individual to gain and maintain meaningful work** — a blend of:
 - Knowledge** (academic and technical),
 - Skills** (practical, interpersonal, analytical), and

- Mindset** (adaptability, resilience, ethics, and curiosity).
- A graduate is employable when they can **learn, unlearn, and relearn**, and when organizations perceive value in their contributions beyond academic credentials.

The Employability Paradox

- India produces over **12 million graduates annually**, yet industries across sectors — from technology to manufacturing — often report a shortage of “job-ready” talent. This paradox arises because **academia and industry function on parallel tracks**.
- The education system focuses on credentialing, while industry demands competency. The result: young professionals start their careers unprepared, underconfident, and underproductive.



(Image Source: The Hindu)

Roots of the Divide

A. Academic Challenges

- Outdated Curriculum:** Many institutions continue to teach as if the workplace remains static. The curriculum rarely keeps pace with rapid transformations in technology, sustainability, and digital business models.
- Theory-based Learning:** Classrooms

emphasize lectures, rote assessments, and standardized examinations, with limited exposure to real-world problem-solving or interdisciplinary collaboration.

- **Inadequate Soft-skill Training:** Communication, teamwork, leadership, and adaptability – crucial for employability – receive minimal attention in academic programs.
- **Faculty and Infrastructure Limitations:** Faculty often lack contemporary industry experience, and laboratories or innovation hubs remain underdeveloped in most institutions.

B. Industry-side Gaps

- **Expectation Mismatch:** Employers expect “job-ready” graduates but are unwilling to invest sufficiently in early-career mentoring and skilling.
- **Rapid Technological Change:** Skills become obsolete quickly; industries need agile learners, but academia rarely trains for adaptability.
- **Limited Collaboration:** Many firms treat engagement with universities as peripheral, not strategic, missing opportunities to co-create talent pipelines.

What Academia Can Learn from Industry

- **Integrate Real-world Relevance:** Embedding live business projects, simulations, and case studies into the curriculum fosters problem-solving and decision-making skills.
- **Prioritize Adaptability Over Grades:** The future workforce must navigate ambiguity. Interdisciplinary projects and experiential learning cultivate flexibility and resilience.
- **Continuous Faculty-Industry Exchange:** Short sabbaticals, consulting stints, and internships for faculty ensure

they remain updated on emerging technologies and workplace practices.

- **Redefine Internships:** Structured internships with mentors, defined objectives, and reflection sessions enhance professional maturity and confidence.
- **Transform Placement Cells:** From “job boards” to “career bridges” – placement offices should track alumni progress, analyze industry trends, and adapt student training modules accordingly.

What Industry Can Learn from Academia

- **Invest in Early-career Development:** Rather than expecting perfection, organizations must design structured onboarding, mentoring, and rotational programs that help new hires integrate and grow.
- **Co-design Courses and Curriculum:** Industry leaders should participate in syllabus design, lead workshops, and share insights on emerging skill demands.
- **Create Collaborative Learning Ecosystems:** Sponsored laboratories, innovation challenges, and co-branded certificate programs can make education more responsive to market realities.
- **Strengthen Internal Feedback Loops:** Recruitment, training, and HR teams must share performance insights with academia to ensure that feedback is continuous and actionable.

The Intersection: Where Change Happens

- Real transformation requires **joint ownership** of outcomes. Academia and industry can build sustainable bridges through:
- **Joint Curriculum Reviews:** Regular workshops to align academic content with emerging job profiles.

- **Apprenticeship and Work-integrated Learning:** Models such as the German *dual system* or India's *NAPS* (National Apprenticeship Promotion Scheme) can combine classroom learning with on-ground experience.
- **Outcome-based Evaluation:** Universities should track alumni performance and job satisfaction six to twelve months post-placement.
- **Regional Collaborations:** Context-specific solutions are essential — regional industries can partner with local colleges to design tailored skilling programs.
- **Micro-credentials and Modular Learning:** Industry-certified short courses in AI, data analytics, sustainability, and communication can supplement degrees with practical skills.
- **Soft-skill and Mindset Labs:** Jointly managed spaces focusing on emotional intelligence, ethics, and collaboration prepare students for professional environments.

Pitfalls to Avoid

- **Avoid Symbolic Partnerships:** Industry lectures and MoUs should not be ceremonial; they must integrate into the academic calendar.
- **Don't Teach Technology in Isolation:** Courses on AI or blockchain without ethics or critical thinking are hollow.
- **Reject One-size-fits-all Models:** Rural and urban institutions require differentiated strategies.
- **Don't Equate Employability with Salary:** True employability includes growth potential, adaptability, and professional ethics.

What Can Be Done Immediately

- **For Academia:** Conduct a "skills audit"

with local employers — ask what competencies they expect in the first 90 days of employment and redesign one course accordingly.

- **For Industry: Adopt a college** — mentor faculty, design projects, and interact with students regularly.
- **For Policymakers:** Incentivize **academia-industry partnerships** through grants, tax benefits, and performance-linked funding for institutions.
- **For Students:** Cultivate **lifelong learning habits** through MOOCs, peer projects, and internships beyond formal degree requirements.

Why This Matters

- India's **demographic dividend** can either power its global rise or become a demographic burden. The employability gap not only hampers GDP growth but also erodes youth confidence, contributes to underemployment, and widens inequality.
- However, when academia and industry collaborate meaningfully, they create a **virtuous cycle of talent, innovation, and productivity**. The goal is not just to produce employees — but **purpose-driven professionals** equipped for an uncertain future.

Conclusion:

- Bridging the employability gap is not about perfection, but progress — **one classroom, one internship, one collaborative workshop at a time**.

India's Services Sector: The Growth Engine Facing a Reality Check

Source: Times of India

UPSC Relevance: GS3 Economy

Context: India's Services Sector

Why in News?

According to NITI Aayog's report "India's Services Sector: Insights from Employment Trends and State-Level Dynamics" (2025), India's services sector contributes over half of the national output but employs less than one-third of the workforce.

Introduction

- For decades, India's services sector has been hailed as the engine of economic growth — driving GDP expansion, exports, and innovation.
- However, a new report by **NITI Aayog** titled "*India's Services Sector: Insights from Employment Trends and State-Level Dynamics*" brings a nuanced perspective to this narrative.
- It reveals that while the services sector contributes **over 55% to India's Gross Value Added (GVA)**, it employs **less than one-third of the workforce**, exposing a deep **structural imbalance** in the country's development trajectory.



(Image Source: Times of India)

The Structural Paradox: Growth Without Enough Jobs

- The report underscores a familiar paradox in India's growth story — **high output growth with limited employment generation**.
- Between **2011-12 and 2023-24**, the share of employment in services rose modestly from **26.9% to 29.7%**, adding around **40 million jobs**. Yet, this remains well below the **global average of 50%**, reflecting a **slower structural transition** from agriculture and manufacturing to services.
- While modern services such as **information technology, finance, and professional services** have propelled India's GDP growth, their employment absorption remains low. Conversely, the bulk of new jobs have emerged in **low-value, informal segments** like **retail trade, transport, and personal services** — sectors that sustain livelihoods but offer little upward mobility.
- This "**disconnect between growth and employment**", as highlighted by NITI Aayog, defines the central challenge of India's services-led development model — a phenomenon often described as "**jobless growth**."

Uneven Transitions: Geography and Gender Divide

- India's services transformation has been uneven across regions and demographic groups.
- Urban-Rural Divide:**
 - Over **60% of urban workers** are engaged in services compared to **less than 20% in rural areas**. Rural employment continues to rely heavily on agriculture and traditional sectors, limiting

productivity and income growth.

- **Gender Gaps:**
 - Only **10.5% of rural women** are employed in the services sector, against **60% in urban areas**. Moreover, most women workers remain concentrated in **informal, low-value roles** such as domestic work, education, and retail.
 - The report attributes these disparities to **barriers in education, mobility, and digital access**, along with persistent **socio-cultural constraints** that hinder women's participation in modern services.
- **Skill Mismatch:**
 - Despite rising education levels, the **quality of available jobs** has not kept pace with the aspirations and skills of the labour force. The Aayog points to a **"growing mismatch"** between education and employability, suggesting that **skilling programmes are not aligned** with the evolving needs of digital and green economies.

Regional Disparities: Leaders and Laggards

- India's services sector growth has been **regionally concentrated**.
- **Leading States:** Karnataka, Maharashtra, Tamil Nadu, and Telangana have built strong service ecosystems through robust **digital infrastructure, institutional capacity, and linkages with manufacturing**. These states attract investment, talent, and innovation, creating **high-value output hubs** such as Bengaluru, Hyderabad, Pune, and Chennai.
- **Lagging States:** States such as Bihar, Madhya Pradesh, Uttar Pradesh, and Odisha remain dependent on low-

productivity traditional sectors, lacking adequate infrastructure and skilled manpower. The widening gap between advanced and lagging regions, if left unaddressed, could **deepen inequality and slow India's shift toward high-value employment**.

- However, a companion report – *"India's Services Sector: Insights from GVA Trends and State-Level Dynamics"* – notes some positive signs of **catch-up among lagging states**, indicating **early convergence** through improved connectivity and digital access.

The Policy Path Ahead

- To bridge these gaps and make the services transformation more inclusive, NITI Aayog outlines a **four-part policy framework**:
- **Formalisation and Social Protection:** Extend coverage to **gig workers, self-employed individuals, and MSME employees**, ensuring social security, health insurance, and pension benefits under schemes like e-Shram and EPFO.
- **Targeted Skilling and Digital Inclusion:** Focus on **women and rural youth**, aligning training with emerging sectors like **AI, green tech, logistics, and health services**. Bridging the **digital divide** is key to expanding access to new service opportunities.
- **Regional Diversification:** Promote **new service hubs in Tier-2 and Tier-3 cities**, enabling **balanced regional growth** beyond metros. This would also **decongest urban centers** and stimulate local economies.
- **Investment in Emerging Sectors:** Encourage public and private investments in **green, digital, and creative industries**, which hold potential for both **high-value output and**

sustainable employment.

Towards an Inclusive Transformation

- While India's services sector remains the backbone of economic expansion, it faces a crucial test — **how to translate growth into decent work**.
- NITI Aayog's findings emphasize that future success will depend not only on **how much the sector contributes to GDP**, but **how effectively it creates secure, high-quality livelihoods** for millions.
- For policymakers, the challenge lies in ensuring that the services-led growth story becomes **broad-based, gender-inclusive, regionally balanced, and future-ready**.
- As India aspires to become a **\$5 trillion economy**, strengthening the services sector through **formalisation, skill enhancement, and digital inclusion** will be essential to achieving **inclusive and sustainable development**.

Conclusion:

- The services sector embodies both **India's progress and its paradox** — a symbol of economic dynamism yet a reminder of persistent inequality.

Centre's Gene-Edited Rice Claims Under Scrutiny

Source: Down To Earth

UPSC Relevance: GS 3 Economy-Agriculture

Context: gene-edited rice varieties

Why in News?

ICAR's own trial data showed no consistent yield or early maturity advantage for the government-promoted gene-edited rice varieties — DRR Rice 100 (Kamala) and Pusa

DST Rice 1 — challenging official claims.

Introduction

- Recently the Union Ministry of Agriculture and Farmers' Welfare announced the release of two genome-edited rice varieties—**DRR Rice 100 (Kamala)** and **Pusa DST Rice 1**—with the promise of higher yield, early maturity, and improved tolerance to drought and salinity.
- Developed using the **CRISPR-Cas9 gene-editing technology** by public research institutes under the **Indian Council of Agricultural Research (ICAR)**, the initiative was hailed as a landmark step toward sustainable and climate-resilient agriculture.
- However, a **recent analysis of ICAR's trial data (2023-24)** by the **Coalition for a GM-Free India**, a network of scientists, farmers, and activists, has raised significant questions about the veracity of the government's claims.
- The findings reveal inconsistencies between ICAR's internal data and the claims made during the varieties' release, prompting demands for an independent review.



(image Source: Down To earth)

Background: The Government's Claims

- The Union Government introduced the two genome-edited rice varieties as part of its efforts to modernize Indian

agriculture through science and technology.

- **DRR Rice 100 (Kamala)** was developed by the **ICAR-Indian Institute of Rice Research (ICAR-IIRR)**, Hyderabad, based on the popular variety **Samba Mahsuri (BPT-5204)**.
- **Pusa DST Rice 1** was developed by the **ICAR-Indian Agricultural Research Institute (IARI)**, New Delhi, derived from **Cotton Dora Sannalu (MTU 1010)**.
- The government claimed that both varieties:
 - Offer **17-30% higher yield** than their parent varieties.
 - Exhibit **early maturity**, saving up to **20 days**, thereby conserving water and fertilizers.
 - Possess **enhanced drought and salinity tolerance**.
 - Are **environmentally sustainable**, potentially reducing greenhouse gas emissions.
 - Are **non-transgenic**, as **no foreign DNA** has been inserted during genome editing.
- These claims positioned the varieties as “revolutionary innovations” in Indian rice breeding, signaling a shift toward **new plant breeding techniques (NBTs)** such as CRISPR.

Findings from ICAR's Trial Data (2023-24)

- The **Coalition for a GM-Free India**, after analyzing data from ICAR's **All India Coordinated Rice Improvement Project (AICRIP)** annual reports, found that the performance of both varieties **did not substantiate the government's claims**.

1. Pusa DST Rice 1

- In 2023 trials, **no data** was available for drought or salinity tolerance due to **limited seed quantity**, contradicting claims of superior stress tolerance.

- In 12 out of 20 trial locations, **yields were equal to or lower** than the parent variety, **MTU 1010**.
- The overall mean yield was **4.8% lower** in several sites.
- In 2024, trials in saline and alkaline soils showed **no significant advantage**, with only a **1.6% marginal gain** in alkaline conditions.
- Despite this, ICAR's reports highlighted a “**30% yield improvement**”, allegedly by **selectively reporting** data from a limited set of locations.
- The analysis concluded that the government's claims of “superior yield and salinity tolerance” were **not supported by comprehensive field data**.

2. DRR Rice 100 (Kamala)

- Derived from **BPT-5204 (Samba Mahsuri)**, Kamala was promoted as **yielding 17% more** and **maturing 20 days earlier**.
- In 2023, Kamala **underperformed in 8 of 19 locations**.
- In Eastern and Central zones, yields were **significantly lower** than the parent variety.
- The **overall mean yield** was **4% less**, and **no data supported claims** of early maturity.
- The **Days to 50% Flowering (DFF)** showed minimal differences—Kamala averaged **101 days** versus **104 days** for the parent, with variations of only **2-7 days earlier** in some zones and **up to 9 days later** in others.
- This indicated **inconsistency and lack of reproducibility**, fundamental parameters for varietal validation.

Gene Editing

- **Gene editing** is a set of scientific techniques used to **precisely alter the**

DNA sequence of an organism.

- Unlike traditional genetic modification (which introduces foreign genes), gene editing **modifies the organism's own genes** to achieve desired traits such as higher yield, disease resistance, or stress tolerance.
 - **Key Technique: CRISPR-Cas9**
 - **CRISPR** stands for **Clustered Regularly Interspaced Short Palindromic Repeats**, and **Cas9** is a specialized enzyme that cuts DNA at targeted sites.
 - It works like **molecular scissors**: scientists program Cas9 to identify a specific DNA sequence and make a cut; the cell's natural repair mechanism then alters the gene in the desired way.
 - It is **faster, cheaper, and more precise** than earlier techniques such as **Zinc Finger Nucleases (ZFNs)** or **TALENs**.
 - **Types of Genome Editing in Agriculture**
1. **Site-Directed Mutagenesis:** Creating small insertions or deletions to knock out or modify gene function.
 2. **Gene Correction:** Repairing or improving a specific defective gene.
 3. **Trait Enhancement:** Altering existing genes to improve yield, drought, or salinity tolerance.

Difference between Gene Editing and Genetic Modification (GMOs)

Feature	Gene Editing	Genetic Modification (GMOs)
DNA Source	Uses organism's own DNA	Introduces foreign DNA from another species
Regulation	Less	Strict biosafety

in India	stringent (if no foreign DNA added)	clearance required
Example	DRR Rice 100 (Kamala), Pusa DST Rice 1	Bt Cotton, GM Mustard

Regulation in India

- Governed by **Department of Biotechnology (DBT)** guidelines (2022).
- Gene-edited crops **without foreign DNA** are **not treated as GMOs**, meaning they face **simpler approval procedures**.

Oversight provided by **Review Committee on Genetic Manipulation (RCGM)** and **Genetic Engineering Appraisal Committee (GEAC)**.

Concerns Raised by Experts and Civil Society

- The **Coalition for a GM-Free India** characterized the government's promotion as a **"hasty endorsement of underperforming varieties"**, aimed at **bypassing public scrutiny and resistance** to genetically modified (GM) technologies.
- Key concerns include:
 - **Lack of transparency:** Trial data and methodology were not fully disclosed for independent verification.
 - **Scientific inconsistency:** Performance results lacked uniformity across zones and seasons.
 - **Regulatory oversight:** Genome-edited crops, though claimed to be non-transgenic, still involve **genomic alterations** that warrant strict

biosafety assessments.

- **Seed sovereignty risks:** Dependence on CRISPR technology, largely developed and patented abroad, could **increase reliance on multinational corporations (MNCs)** for seed technologies.
- Agricultural activist **Kavitha Kuruganti** warned that “bad science in agriculture, especially from the public sector, directly affects farmers’ livelihoods,” urging greater scientific rigor and public accountability.

Broader Implications

1. Scientific and Policy Integrity

- The controversy underscores the need for **robust, evidence-based validation** before the public release of gene-edited crops. Scientific credibility of public institutions like ICAR depends on **transparent data sharing** and **independent peer review**.

2. Biosafety and Regulatory Oversight

- India’s **2022 genome-editing guidelines** classify gene-edited crops without foreign DNA as **non-GM**, exempting them from stringent biosafety regulation. The current episode calls for a **reassessment of this regulatory distinction**, as even minimal edits can have unforeseen effects on plant metabolism and ecology.

3. Public Trust in Agri-Biotechnology

- Premature promotion of unverified technologies risks **undermining public confidence** in legitimate scientific innovations. India’s experience with **Bt brinjal** and **GM mustard debates** shows that public trust hinges on **transparency and participatory decision-making**.

4. Farmer Welfare and Seed Sovereignty

- If gene-editing technologies are commercialized without due diligence, farmers could face **economic vulnerabilities**, including **dependency on patented seed technologies** and **loss of traditional varietal diversity**.

Conclusion:

- The controversy over DRR Rice 100 (Kamala) and Pusa DST Rice 1 highlights a crucial lesson for India’s agricultural policy: **scientific innovation must be backed by transparent evidence, not narrative enthusiasm**.
- While gene-editing holds promise for climate-resilient and sustainable agriculture, its adoption must follow **rigorous evaluation, ethical oversight, and democratic accountability**.



ENVIRONMENT & ECOLOGY

Dugong Conservation in India

Source: The Hindu

UPSC Relevance: GS3 Environment and Ecology

Context: Dugong Conservation in India

Why in News?

Dugong populations in India, once widespread, are now critically low, prompting the establishment of the Palk Bay Dugong Conservation Reserve in 2022



(Image Source: Nature Conservation Foundation)

Introduction

- The **dugong** (*Dugong dugon*), often referred to as the 'sea cow', is a marine herbivore that once thrived along the Indian coastline, particularly in the **Gulf of Mannar, Palk Bay, Gulf of Kutch, and the Andaman and Nicobar Islands**.
- Over the decades, its population has drastically declined, reduced to just a few hundred individuals in Indian waters. Several anthropogenic pressures have contributed to this decline, including **poaching, accidental by-catch**

in fishing nets, habitat degradation due to seagrass loss, pollution from agriculture and industry, and the slow reproductive rate of the species.

- The dwindling population raised fears of extinction two decades ago, prompting both state and central authorities to initiate targeted conservation measures.

Palk Bay Dugong Conservation Reserve: A Milestone

- A significant step in dugong conservation came in **2022 with the establishment of the Dugong Conservation Reserve in Palk Bay under the Wildlife (Protection) Act, 1972**.
- Covering **over 12,000 hectares of seagrass meadows**, this reserve is the first dedicated dugong conservation area in India. The initiative exemplifies **integrated marine conservation**, combining **scientific input from the Wildlife Institute of India (WII)** with **active engagement of local fishing communities**.
- This partnership has yielded tangible results:
 - **Poaching has been curtailed** through stricter monitoring and awareness campaigns.
 - Fishers now **release dugongs accidentally caught in nets**, reducing by-catch mortality.
 - The **dugong population in the reserve has risen to over 200 individuals**, as per WII surveys—a fragile but encouraging recovery.
 - The Palk Bay model has also

incorporated **modern technologies**, including **drones for aerial surveys**, **acoustic sensors**, and **satellite-based mapping of seagrass beds**, demonstrating how innovation can complement traditional ecological knowledge.

- In recognition of these efforts, the **International Union for Conservation of Nature (IUCN)** has hailed the reserve as an **exemplar for marine conservation**, highlighting its **ecological significance** and **innovative restoration techniques**.

Challenges in Dugong Conservation

Despite these achievements, several challenges remain:

- **Habitat threats** persist even within the reserve, including mechanised fishing, port construction, dredging, and coastal pollution.
- Dugongs continue to face **by-catch mortality in fishing nets**, limiting population recovery.
- **Climate-related threats** such as rising sea temperatures, ocean acidification, and increasing storms threaten both seagrass meadows and dugong survival.
- Populations in **Gujarat and the Andaman Islands** are smaller and less protected, demonstrating that **conservation success is currently regional rather than nationwide**.
- Experts also emphasise the **need for cross-border collaboration**, particularly with **Sri Lanka**, as dugongs traverse the narrow Palk Strait. Without coordinated protection measures across borders, the species' recovery risks being **localised and unsustainable**.
- Furthermore, **long-term funding remains inconsistent**. While allocations from the **Compensatory Afforestation Fund (CAMPA)** have supported

restoration and monitoring, the **slow reproductive cycle of dugongs** requires **sustained financial investment over decades**, underscoring the importance of predictable and steady funding for meaningful conservation outcomes.

Lessons for Broader Marine Conservation

The Palk Bay experience offers critical insights for marine conservation in India:

- **Community Engagement:** Treating fishers as **partners rather than adversaries** mitigates by-catch and creates local constituencies that actively participate in conservation.
- **Science-Policy Integration:** Blending **traditional ecological knowledge with modern technology**, such as drones and acoustic mapping, bridges the gap between local practices and scientific innovation.
- **International Recognition:** IUCN endorsement not only **legitimises domestic conservation efforts** but also fosters **knowledge exchange and potential funding support**.
- **Sustained and Coordinated Efforts:** Protection must be **long-term, well-funded, and include cross-border collaboration**, highlighting the importance of ecosystem-level planning rather than isolated interventions.

Conclusion:

- The **Palk Bay Dugong Conservation Reserve** stands as a **model for integrated, science-driven, and community-led marine conservation in India**.

The Cost of Convenience: E-Waste and Public Health Hazards in India

Source: The Hindu

UPSC Relevance: GS3 Environment and Ecology

Context: E-waste in India

Why in News?

India generated 2.2 million MT of e-waste in 2025, with informal recycling exposing workers and communities to severe health hazards.



(Image Source: The Hindu)

Introduction

- India's digital revolution-marked by the rapid spread of smartphones, laptops, home appliances, and other electronic gadgets-has brought unprecedented convenience to communication, commerce, education, and governance. However, this technological leap has a hidden cost: **electronic waste (e-waste)**.
- E-waste is now the **fastest-growing solid waste stream worldwide**, and India is at the center of this crisis.
- The health hazards arising from improper e-waste management underscore the paradox of modern convenience-progress accompanied by toxicity.

India's E-Waste Burden

- Third-largest e-waste generator:** India

produced **2.2 million metric tonnes (MT)** of e-waste in 2025, behind only China and the United States.

- Rapid growth:** This reflects a **150% rise** from **0.71 million MT** in 2017-18.
- At the current pace, India's e-waste volume is projected to **double by 2030**.
- Urban Hotspots**
 - More than **60% of e-waste** originates from just **65 cities**.
 - Major hotspots: **Seelampur and Mustafabad (Delhi)**, **Moradabad (Uttar Pradesh)**, **Bhiwandi (Maharashtra)**.
 - Despite **322 registered formal recycling units** with a combined capacity of **2.2 million MT annually**, **over half** of the e-waste is **processed informally or dumped**.

Informal Recycling and Its Hazards

The informal sector, dominated by **Kabadiwalas, scrap dealers, and slum-based workshops**, uses crude and unscientific methods such as:

- Open-air burning of wires and circuit boards**
- Acid leaching** to extract precious metals
- Manual dismantling without protective gear**
- These practices **release more than 1,000 toxic substances**, including:
 - Heavy metals:** Lead, cadmium, mercury, chromium
 - Persistent organic pollutants (POPs):** Dioxins, furans, brominated flame retardants
 - Particulate matter:** PM_{2.5} and PM₁₀
 - Scientific data:** PM_{2.5} levels in recycling zones like Seelampur often **exceed 300 µg/m³**, which is **12 times higher** than the WHO 24-hour safety limit of **25 µg/m³**.

E-Waste and Human Health

1. Respiratory Illnesses

- Informal recycling releases **toxic gases and fine particulate matter** that penetrate deep into lungs.
- A study in **Benin, West Africa**, found **33.1% of e-waste workers** suffered respiratory issues (vs. 21.6% in control groups).
- A **2025 Indian study (MDPI Applied Sciences)** reported that **76–80% of informal e-waste workers** experienced chronic bronchitis, asthma, and persistent cough.

2. Neurological Damage and Developmental Delays

- **Lead, mercury, and cadmium** exposure harms the nervous system.
- **Children** are particularly vulnerable: even **blood lead levels below 5 µg/dL** can reduce IQ, impair cognition, and trigger behavioral disorders.
- A **2023 systematic review (Frontiers in Public Health)** highlighted widespread elevated blood lead levels in children in e-waste recycling hubs.

3. Skin and Ocular Disorders

- Direct contact with CRT screens, circuit boards, and acids causes **rashes, chemical burns, dermatitis, and eye irritation**.
- A **2024 review** found **skin disorders affected nearly 100%** of informal recyclers in several clusters.
- In **Guiyu, China**, chronic exposure was linked to **miscarriages, preterm births, and persistent gastritis** due to soil contamination with lead and chromium.

4. Genetic and Systemic Impacts

- **DNA damage, epigenetic changes, and oxidative stress** were documented in exposed populations.
- **Children** show increased markers of inflammation, reduced immunity, and impaired lung function.

Intersection of Pollution and Poverty

- The health effects of e-waste worsen existing vulnerabilities—**poverty, malnutrition, lack of healthcare, and unsafe housing**—creating a “**syndemic**” where multiple risks amplify each other.
- Globally, **18 million children and 13 million women** live or work in informal waste zones (WHO). In India, children often dismantle gadgets alongside parents, facing **irreversible long-term health damage**.

Policy Framework in India

- **E-Waste (Management) Rules, 2022**
 - **Extended Producer Responsibility (EPR):** Manufacturers are responsible for collecting and recycling e-waste.
 - **Mandatory registration** for recyclers and dismantlers.
 - Incentives to **formalise informal workers** and promote **scientific disposal**.
- **Implementation Gaps**
 - As of **2023–24**, **only 43%** of e-waste was processed formally.
 - **Capping of EPR credit prices** has led to disputes between manufacturers and regulators.
 - Weak enforcement and lack of public awareness hinder progress.

The Way Forward

1. Formalising the Informal

Integrate informal workers into the regulated sector through:

- Skill certification
- Provision of PPE (gloves, masks)
- Safe recycling infrastructure
- Access to healthcare and social security

2. Strengthening Enforcement

- Empower **pollution control boards**

- Introduce **digital e-waste tracking** and **environmental audits**

3. Expanding Medical Surveillance

- **Health camps** in hotspots
- **Long-term studies** on children and workers in affected areas

4. Fostering Innovation

- Invest in **R&D for affordable local recycling technologies**
- Promote **decentralised treatment hubs**

5. Raising Awareness

- Launch **mass awareness campaigns**
- Include **e-waste education** in school curricula

Challenges

- **Fragmented informal sector** resistant to regulation
- **Limited consumer awareness** about safe disposal
- **Inadequate infrastructure** in smaller towns and rural areas
- **Economic constraints** for scaling scientific recycling solutions

Conclusion:

- India stands at a **toxic crossroads**. The digital boom that fuels its economy cannot come at the cost of **public health and environmental integrity**.

Investment in Clean Indoor Air: A Vital Pillar for Pandemic Preparedness and Climate Resilience

Source: Down To Earth

UPSC Relevance: GS3 Environment and Ecology

Context: Investment in Clean Indoor Air

Why in News?

Investment in clean indoor air is crucial for preventing respiratory infections, improving productivity, and preparing for future pandemics and climate emergencies.



(Image Source: Down To earth)

Introduction

- India's Air is fundamental to life, yet its quality – particularly **indoor air quality (IAQ)** – remains overlooked in public health and climate policies.
- The **COVID-19 pandemic** exposed how indoor spaces can accelerate the spread of infectious diseases, while worsening air pollution and climate-driven disasters like **wildfires** have made clean indoor air a pressing need.
- A landmark step in this direction was taken at the **80th UN General Assembly (2025)**, where indoor air experts, led by the **Australian Academy of Science** and the **Burnet Institute**, launched the **Global Pledge for Healthy Indoor Air**.
- Recognising clean indoor air as a universal health protection – akin to clean drinking water-
 - This pledge underscores the urgent need for strategic investment in IAQ as a cornerstone of **pandemic preparedness, climate adaptation, and human productivity**.

Importance of Clean Indoor Air

- **Human Health and Productivity**
 - We breathe more than **7,000 litres of air every day**, most of it indoors—at home, workplaces, schools, and hospitals.
 - Poor IAQ contributes to **respiratory infections (influenza, COVID-19), asthma, cancers, cardiovascular diseases, and cognitive fatigue**.
 - Evidence shows that better ventilation and filtration improve **alertness, concentration, and productivity** at workplaces and schools.
- **Economic Impact of Inaction**
 - The **annual economic burden of influenza** in the US alone is estimated at **US\$11.2 billion**, while other respiratory infections cost **US\$40 billion**.
 - Lost working days due to illness lower national productivity, amplifying economic vulnerabilities—especially during pandemics.
- **Pandemic Preparedness**
 - Future pandemics are **highly likely to be airborne**.
 - Clean indoor air acts as a **non-pharmaceutical intervention**, reducing transmission in public spaces like hospitals, classrooms, and offices.
 - Every **COVID wave and seasonal flu surge** highlights our continued vulnerability to unclean indoor air.
- **Climate Change Linkages**
 - **Wildfires, rising temperatures, and urban air pollution** increasingly degrade outdoor air quality, pushing populations indoors.
 - Without robust IAQ systems, indoor spaces fail to serve as refuges during

climate-related air crises.

- Hence, IAQ investment is also part of **climate adaptation strategies**.

Lessons from History: Clean Air as Clean Water

Public health history offers a compelling analogy:

- In the **19th century**, cholera epidemics plagued major cities like London.
- The solution lay in **separating drinking water from wastewater**, a reform that made waterborne epidemics nearly extinct in high-income nations.
- Similarly, investing in **ventilation, filtration, and IAQ standards** today could make **airborne epidemics preventable** in the future.
- This historical parallel highlights that **air quality management should be viewed as basic public health infrastructure** rather than an optional luxury.

Strategic Pathways for Action

The authors outline **three principles** to operationalise evidence into policy and practice:

1. Government-led Strategic Approach

- **Prioritisation:** Begin with high-density, high-risk spaces such as **schools, workplaces, hospitals, and public transport hubs**.
- **Planning and Investment:** Allocate resources with **clear timelines and measurable targets** to ensure sustained IAQ improvements.

2. Recognition as a Human Right

- IAQ must be enshrined as a **human right and population-level health protection**, not merely an advisory guideline.
- Establish **mandatory indoor air standards** for ventilation, filtration, humidity, and pollutant thresholds in buildings.

- Create **dedicated national IAQ agencies** for enforcement, monitoring, and research.

3. Community and Institutional Leadership

- Empower **schools, workplaces, and local communities** as frontline actors in clean air initiatives.
- Promote **citizen science projects** to monitor IAQ at the grassroots level.
- Encourage **“clean air champions”**, particularly among youth, to drive awareness and behavioural change.

Global Pledge for Healthy Indoor Air: A Landmark Initiative

- Over **150 organisations worldwide** have endorsed this pledge to push for **global IAQ standards**.
- It reflects the **shift from reactive health responses to preventive infrastructure investment**.
- Countries like **Australia** are leading by example, while others such as **New Zealand** still lack national IAQ strategies or agencies—revealing the uneven global preparedness landscape.

Challenges to Implementation

- Despite growing recognition, several barriers persist:
- **Financial Constraints:** Upfront costs of installing or upgrading IAQ systems often deter investment, despite long-term savings.
- **Lack of Awareness:** Public and political understanding of IAQ's role in preventing disease remains limited.
- **Weak Governance:** Absence of **mandatory standards, monitoring mechanisms, and accountability** slows progress.
- **Equity Concerns:** Vulnerable populations in low-income regions face

disproportionately high exposure to poor IAQ due to substandard housing and infrastructure.

Way Forward

To mainstream IAQ investment as part of **pandemic preparedness and climate resilience**, countries must:

- Integrate IAQ targets into **National Pandemic Preparedness Plans** and **Climate Adaptation Strategies**.
- Foster **public-private partnerships** for cost-effective technology deployment in ventilation, filtration, and sensor-based monitoring.
- Incentivise **green building standards** that prioritise IAQ alongside energy efficiency.
- Enhance **international cooperation** to share best practices, research, and financing models.

Conclusion:

- Clean indoor air is no longer a matter of comfort—it is a non-negotiable determinant of health, economic stability, and social resilience.
- The lesson from history is clear: just as 19th-century investment in clean water eradicated cholera, 21st-century investment in clean indoor air can protect humanity from future airborne pandemics and climate emergencies.

Biodiversity of Lucknow's Kukrail Forest and the Development Dilemma

Source: Down to Earth

UPSC Relevance: GS3 Environment and Ecology

Context: Kukrail Forest biodiversity issue

Why in News?

Kukrail Reserve Forest in Lucknow, UP, is an urban biodiversity hotspot with 39 species of amphibians and reptiles, including seven endangered species, currently threatened by proposed urban development.

Introduction

- The Kukrail Reserve Forest in Lucknow, Uttar Pradesh, often called “*Awadh's hidden Eden*”, has emerged as a significant **urban biodiversity hotspot**.
- A recent research paper by **Jon Hakim** and **Shaariq Ashar** highlights the rich **herpetofaunal diversity** – amphibians and reptiles – found in this forest despite it being surrounded by bustling urban areas.
- This finding comes at a crucial time when the **Uttar Pradesh government's plan to develop 295 hectares of the forest for a zoo, safari, and tourism infrastructure** poses ecological threats to the reserve.

Kukrail Forest:

- **Location:** Lucknow, the capital of Uttar Pradesh.
- **Type:** Urban forest / reserve forest.
- **Significance:** Acts as a **green lung** for the city, helping mitigate urban heat, reduce pollution, and control stormwater runoff.
- **Biodiversity**
 - **Herpetofaunal diversity:** 39 species of frogs, lizards, snakes, turtles, and crocodiles, making it the **second-highest herpetofaunal diversity in UP**.
 - **New regional sightings:**
 - **Slender Blind Snake** – first sighting in Uttar Pradesh.

- **White-snouted Pug-nose Frog** – first sighting in Uttar Pradesh.
- **Endangered species:**
 - Red Sand Boa
 - Yellow Monitor Lizard
 - Ganges Soft-shelled Turtle

Key Findings of the Study

Species Diversity:

- The study recorded **39 species of frogs, lizards, snakes, turtles, and crocodiles** in Kukrail.
- This is the **second-highest herpetological diversity ever recorded in Uttar Pradesh**.

New Regional Sightings:

- First-ever sightings in Uttar Pradesh of:
- **Slender Blind Snake** (*Indotyphlops braminus*)
- **White-snouted Pug-nose Frog**
- **Endangered Species:** Seven species in Kukrail are listed as **Endangered on the IUCN Red List**, including:
 - Red Sand Boa (*Eryx johnii*)
 - Yellow Monitor Lizard (*Varanus flavescens*)
 - Ganges Soft-shelled Turtle (*Nilssonia gangetica*)
- **Ecological Services Provided by Kukrail's Fauna:**
 - **Control of insect and rodent populations**
 - **Nutrient cycling** and cleaning of underwater carcasses
 - **Flood mitigation** and **stormwater management**
 - **Air and noise pollution reduction**
- **Microclimate regulation** – reducing urban heat island effects
- **Mental and physical health benefits** for city residents



(Image Source: Down To Earth)

Ecological Significance of Urban Forests

Urban forests like Kukrail are critical in maintaining **ecological balance** within cities. They serve as:

- **Green lungs** to improve air quality
- **Carbon sinks** mitigating climate change
- **Buffers against floods and soil erosion**
- **Habitat corridors** for wildlife
- **Biodiversity hotspots** even in urbanised regions

Threats to Kukrail's Biodiversity

(a) Proposed Development Plan

The **Uttar Pradesh government** plans to develop 730 acres (295 ha) of Kukrail Reserve Forest to build:

- A zoo
- Animal safari
- Other tourist attractions

(b) Direct and Indirect Impacts

- **Loss of native forest habitat** due to construction
- **Road expansion** fragmenting habitats and increasing wildlife mortality
- **Pollution from tourist inflow** (noise, waste dumping, and vehicular emissions)
- **Construction overflow** damaging areas beyond the proposed 295 hectares
- **Disturbance to water bodies** crucial for amphibians and reptiles
- **Risk of invasive species** introduction via landscaping and tourism activities

- Uttar Pradesh already suffers from **low forest cover (6%)**, making the conservation of existing forests even more critical.

Recommendations by Researchers

The study proposed a **balanced development approach** to protect Kukrail's ecological integrity:

- **Minimise loss of native forest habitat** during any developmental activity.
- **Implement habitat restoration programs** focusing on:
 - Native vegetation
 - Preservation of mature trees
 - Protection of water bodies
- **Limit the length and width of new roads** within the forest.
- **Install wildlife crossings and underpasses** to reduce roadkill.
- **Strict regulation of tourism activities** to avoid overburdening the ecosystem.

Broader Environmental and Policy Context

- India's **National Forest Policy (1988)** aims for **33% forest cover**, but Uttar Pradesh has only **6%**, far below the target.
- The project highlights the **conflict between development and conservation**, a recurring theme in urbanising regions.
- It also ties into India's commitments under:
 - Convention on Biological Diversity (CBD)
 - UN Convention to Combat Desertification (UNCCD)
 - SDG 15: Life on Land

Way Forward

To strike a balance between **urban development**

and biodiversity conservation, the following steps are necessary:

- **Environmental Impact Assessment (EIA)** with a focus on cumulative and indirect impacts.
- **Community participation** in planning and monitoring development projects.
- Establishing **Urban Biodiversity Registers** under the **Biological Diversity Act, 2002**.
- Strengthening **State Biodiversity Boards** and ensuring proper funding for restoration.
- Promoting **eco-tourism** over intensive safari-style tourism to reduce habitat destruction.
- Regular **biodiversity monitoring** to detect population changes in sensitive species.

Conclusion:

- Kukrail Reserve Forest exemplifies how **urban forests can act as biodiversity strongholds**, offering crucial ecosystem services amid rapidly growing cities.
- However, **unregulated development threatens to irreversibly damage this natural heritage**.

Dharwad Botanists Discover Four New Plant Species in the Western Ghats

Source: The Hindu

UPSC Relevance: GS3- Environment and Ecology

Context: New Plant Species

Why in News?

Botanists from Karnatak Science College, Dharwad, discovered four new plant species in the Western Ghats of Karnataka during 2024-25 floristic surveys.

Introduction

- A team of botanists from Karnatak Science College, Dharwad, led by Prof. K. Kotresha, has discovered four new plant species in the Western Ghats of Karnataka.
- The discoveries were made during floristic explorations carried out in 2024-25 and have been published in internationally recognized journals.

Details of the Discovery:

The discoveries form a part of a larger floristic survey being conducted across Karnataka. So far, surveys in eight districts have been completed, with work continuing in the remaining districts. The newly discovered species are:

- **Oberonia marnkuliensis Shreyas & Kotresha** – Found in **Marnkuli Hill, Shivamogga district**, this species has been named after the village of its collection. Published in *Richardiana* international journal, it represents the diversity of Central Western Ghats flora.
- **Zeuxine seetharamii (Betageri & Kotresha)** – Discovered in **Kali Tiger Reserve, Uttara Kannada district**, this species honors Prof. Y.N. Seetharam, a noted taxonomist from Gulbarga University. Its discovery was published in the *Asian Journal of Research in Botany*.
- **Parasopubia gorensis (Patgar, Betageri & Kotresha)** – Collected from **Goregudda, Hindgaon, Kumta taluk, Uttara Kannada district**, this species is named after the Goddess Goreshwara temple on the lateritic plateau. Published in *Phytotaxa*, it highlights the rich biodiversity of the Uttara Kannada region.
- **Utricularia kumtensis (Kanoj, Patgar, Betageri & Kotresha)** – Found near

Mirjan Fort, Kumta taluk, Uttara Kannada district, the species' name reflects its geographical origin. Its discovery was also published in *Phytotaxa*.

Significance of the Discoveries:

- **Biodiversity Documentation:** With an estimated 30 lakh plant species globally, only 2.5 lakh have been documented. The discovery of four new species emphasizes that a vast majority of global flora remains unexplored.
- **Conservation Importance:** Western Ghats is a recognized biodiversity hotspot. Documenting new species aids in conservation planning, especially for endemic or potentially endangered species.
- **Scientific Recognition:** The publication of these discoveries in international journals enhances India's contribution to global botanical research and taxonomy.
- **Regional Development:** These discoveries highlight the ecological richness of districts like Uttara Kannada and Shivamogga, which can be leveraged for eco-tourism, biodiversity education, and local conservation efforts.



(Image Source: The Hindu)

About Western Ghats (Sahyadri Hills)

Location & Geography:

- The Western Ghats, also called the **Sahyadri Hills**, run parallel to India's

western coast.

- Stretch from **Maharashtra** in the north to **Kerala** and **Tamil Nadu** in the south (~1,600 km).
- Passes through **Maharashtra, Goa, Karnataka, Kerala, and Tamil Nadu**.
- Average elevation: 1,200–1,500 m, with the highest peak being **Anamudi (2,695 m) in Kerala**.
- Rivers originating: Godavari, Krishna, Kaveri, Periyar – vital for peninsular India.

Ecological Significance:

- One of the 8 “**hottest hotspots**” of **biodiversity** in the world.
- Dense forests with **evergreen, semi-evergreen, moist deciduous, and montane shola forests**.
- Rich in **endemic species** of flora and fauna.
- Important for **monsoon precipitation** and river flow regulation.

Biodiversity:

- Flora: ~7,400 species of plants; ~30% are endemic. Examples: *Zeuxine seetharamii*, *Oberonia marnkuliensis*.
- Fauna: Home to tigers, elephants, lion-tailed macaques, Malabar civet, and over 500 bird species.
- Known for **medicinal plants**, orchids, and unique montane ecosystems.

Conservation Status:

- **UNESCO World Heritage Site** (1987).
- Many **protected areas**: national parks, wildlife sanctuaries, and biosphere reserves (e.g., Nilgiri, Agasthyamalai, and Kudremukh).
- Threats: deforestation, mining, hydroelectric projects, urbanization, invasive species, and climate change.

Conclusion:

- The discovery of these four new plant species underscores the need for sustained floristic surveys and biodiversity conservation.
- It also reinforces India's position as a global centre for botanical research while emphasizing the critical role of local ecosystems in supporting diverse flora.

WTI Report Highlights Crucial Role of India's Forest Protectors

Source: The Hindu

UPSC Relevance: GS 3 Environment and Ecology

Context: India's Forest Protectors

Why in News?

A recent report by the Wildlife Trust of India (WTI) highlighted the critical role of India's forest protectors, focusing on 540 rangers killed or injured in the line of duty.

Introduction

- India's ecological wealth, encompassing vast forests and diverse wildlife, owes much of its protection to the silent dedication of frontline forest staff.
- A recent report by the **Wildlife Trust of India (WTI)** titled "*Guardians of the Wild: Supporting India's Frontline Forest Staff*" sheds light on the immense contributions, challenges, and sacrifices made by these unsung heroes — the *Van Rakshaks* (forest rangers).
- Released in Abu Dhabi during the **IUCN-WCPA International Ranger Award Ceremony** at the **IUCN World Conservation Congress 2025**, the report underscores the indispensable role of India's forest protectors in safeguarding biodiversity under perilous conditions.

Background and Context

- India is home to **over 1,100 protected areas**, covering more than 5% of its geographical area. These include national parks, wildlife sanctuaries, conservation reserves, and community reserves.
- However, increasing human pressure, poaching, deforestation, and climate change have intensified threats to wildlife and forest ecosystems.
- In this context, forest guards and rangers form the **first line of defense** against environmental degradation and wildlife crimes.
- The WTI, in collaboration with the **International Fund for Animal Welfare (IFAW)**, initiated the **Van Rakshak Project (VRP)** in 2000 to strengthen, equip, and empower these frontline personnel across India.



(Image Source: The Hindu)

Key Highlights of the Report

Scope and Recognition

- The report documents **540 cases of rangers killed or injured** in the line of duty, accompanied by personal narratives from the field.
- It serves as a tribute to the courage and sacrifice of India's forest staff, many of whom operate under hazardous and isolated conditions.

Launch and Global Context

- The report was released by **Kirti Vardhan Singh**, Union Minister of State for Environment, Forest, and Climate Change, alongside WTI Executive Director **Vivek Menon**, IFAW CEO **Azzedine Downes**, IUCN-WPCA Chair **Madhu Rao**, and Abu Dhabi Environment Agency Secretary General **Shaikha Salem al Dhaheri**.
- The event highlighted India's leadership in forest protection within the global conservation discourse.

Van Rakshak Project (VRP) Achievements

- Since its inception in 2000, the VRP has supported **over 21,000 personnel** across India.
- Initiatives include:
 - Training in **wildlife crime prevention** and **human-wildlife conflict mitigation**.
 - Workshops on **basic wildlife rescue techniques**.
 - Provision of **essential field gear** for patrolling and safety.
 - **Supplementary Accident Assurance Scheme**
 - Provides immediate financial relief to frontline forest workers or their families in case of injury or death during service.
- Since 2001, aid has been extended to **367 forest staff or their families**, with **74% cases involving fatalities**.
- During the COVID-19 pandemic, WTI's **Conservation Heroes COVID Casualty Fund** supported **173 families** who lost members to the crisis.

Challenges Faced by Frontline Forest Staff

- **Occupational Hazards:** Rangers face threats from poachers, wild animals, and harsh weather, often with minimal safety gear.
- **Limited Resources:** Many operate with

outdated equipment and inadequate communication systems.

- **Low Recognition and Compensation:** Despite their critical role, forest staff often remain underpaid and underappreciated.
- **Isolation and Mental Stress:** Extended deployment in remote areas with little social or medical support impacts morale and mental health.
- These challenges amplify the urgency for systemic reforms and better welfare measures.

Significance for India's Environmental Governance

- The report reinforces the idea that **effective conservation is people-driven**, especially from the ground level.
- The Van Rakshaks embody the principle of "*Conservation through Commitment*" – ensuring that wildlife protection extends beyond policy frameworks into everyday field realities.
- The WTI initiative aligns with India's broader commitments under:
 - Convention on Biological Diversity (CBD)
 - IUCN's Global Ranger Framework
 - UN Sustainable Development Goals (SDGs) – particularly SDG 13 (Climate Action) and SDG 15 (Life on Land)
- By empowering local protectors, India strengthens both its ecological and social resilience.

Analytical Perspective

The *Guardians of the Wild* report goes beyond mere documentation – it is a **moral and policy appeal**. It calls for:

- Institutionalizing **occupational safety standards** for forest staff.

- Creating a **national-level welfare fund** for rangers.
- Integrating **mental health and family welfare programmes**.
- Enhancing **training, surveillance technology, and protective equipment**.
- Recognizing Van Rakshaks through **national awards and service medals**, similar to police or defense honors.
- Such measures would not only reduce vulnerability but also **professionalize India's forest protection services**, ensuring sustainable biodiversity management.

Conclusion:

- India's forest rangers — the Van Rakshaks — are the invisible guardians of its ecological future. The WTI's *Guardians of the Wild* report is both a tribute and a reminder: conservation success depends as much on those who patrol the forests as on those who make policies.

Kaziranga Director Becomes First Indian to Receive IUCN Award for Innovation in National Parks

Source: The Hindu

UPSC Relevance: GS 3 Environment and Ecology

Context: IUCN Award for Innovation in National Parks

Why in News?

Kaziranga Director becomes first Indian to receive IUCN award for innovation in national parks.

Introduction

- In a landmark achievement for India's conservation community, **Dr. Sonali**

Ghosh, Director of **Kaziranga National Park and Tiger Reserve**, has become the **first Indian** to be conferred the prestigious **Kenton R. Miller Award for Innovation in National Parks and Protected Area Sustainability**.

- The award, presented by the **World Commission on Protected Areas (WCPA)** under the **International Union for Conservation of Nature (IUCN)**, recognizes individuals or teams demonstrating exceptional innovation in the management and sustainability of protected areas.
- Dr. Ghosh received the award alongside **Roque Simón Sevilla Larrea** of Ecuador at a ceremony held in **Abu Dhabi** on **October 10, 2025**.

About the IUCN and WCPA

- The **International Union for Conservation of Nature (IUCN)**, established in **1948**, is a global authority on the status of the natural world and the measures needed to safeguard it. It brings together governments, civil society organizations, and experts to advance sustainable development and biodiversity conservation.
- Within the IUCN, the **World Commission on Protected Areas (WCPA)** is one of six technical commissions.
- It focuses on **protected area governance, management, and policy**, supporting efforts to create, expand, and effectively manage **national parks, wildlife sanctuaries, biosphere reserves, and marine protected areas** across the globe.

About the Kenton R. Miller Award

The **Kenton R. Miller Award**, instituted in **2006** by IUCN-WCPA, is presented **biennially** to individuals or groups who have demonstrated

outstanding innovation in managing protected areas. Named after **Dr. Kenton R. Miller**, a former Director General of IUCN and a pioneer in conservation planning, the award recognizes:

- **Innovations in planning, governance, management, and finance** of protected areas
- **Integration of traditional and modern conservation methods**
- **Capacity building, communication, and monitoring mechanisms**
- **Tangible conservation outcomes** achieved under challenging socio-ecological contexts
- Past recipients have included:
- **Burung Indonesia**, for integrating local knowledge in bird conservation;
- **Nizar Youssef Hani** (Lebanon), for post-conflict ecosystem restoration and community empowerment in the Shouf Biosphere Reserve;
- **Maria Del Carmen Garcia Rivas** (Mexico), for advancing collaborative governance in marine protected areas.

Kaziranga National Park

1. Location and Geography:

- **State:** Assam, India
- **Districts Covered:** Golaghat, Nagaon, and Karbi Anglong
- **Area:** Approximately **430 sq. km** (core area), with a buffer zone of 1,526 sq. km
- **Coordinates:** 26°30'–26°45' N latitude, 93°08'–93°36' E longitude
- **Landscape:** Alluvial floodplains of the **Brahmaputra River**, including grasslands, wetlands, and tropical moist forests

2. Establishment and History:

- **Declared as Reserve Forest:** 1905
- **Declared as National Park:** 1974
- **UNESCO World Heritage Site:** 1985
- Named "**Kaziranga**" after the **Karbi**

word '**Kazzi**', meaning 'goat' or 'hog deer'.

3. Flora and Fauna:

a) Fauna:

- **One-Horned Rhinoceros:** Kaziranga harbours about **two-thirds of the world population**, making it the flagship species.
- **Other Mammals:**
 - Bengal tiger
 - Asian elephant
 - Swamp deer (Barasingha)
 - Wild water buffalo
 - Leopard, sloth bear, hog deer
- **Birds:** Over 450 species including migratory birds such as storks, pelicans, and geese
- **Insects and Spiders:** Rich diversity due to wetlands and grasslands

b) Flora:

- Tropical moist deciduous forests, reed beds, and tall elephant grass
- Floodplain grasslands vital for rhinos and swamp deer

4. Significance:

- **Biodiversity Hotspot:** Part of the **Indo-Burma biodiversity hotspot**
- **Conservation Success:**
 - Population of one-horned rhinoceros has increased from **less than 200 in early 20th century** to over 2,500 today
 - Model of **community-based conservation**
- **Research and Education:** Supports ecological studies, wildlife management research, and environmental awareness programs

Significance of the Award for India

- Dr. Sonali Ghosh's recognition marks a milestone for India's **protected area**

governance model, highlighting the country's transition from traditional fortress-style conservation to **inclusive, community-based environmental stewardship**.

- The IUCN's citation praised her for pioneering a **model of conservation rooted in community engagement, awareness-building, and the fusion of traditional ecological knowledge with scientific expertise**—particularly across the **biodiverse landscapes of Manas and Kaziranga** in Assam.
- This approach aligns with India's broader conservation paradigm under initiatives such as:
 - Project Tiger and Project Elephant
 - Eco-sensitive zone management
 - Community-based ecotourism and livelihood generation
 - Landscape-level conservation planning

Kaziranga National Park: A Global Conservation Icon

- Located in Assam, **Kaziranga National Park** is a **UNESCO World Heritage Site**, renowned for housing two-thirds of the world's **one-horned rhinoceros population**. Beyond the rhino, the park sustains a rich variety of biodiversity, including **tigers, elephants, wild buffaloes, swamp deer, migratory birds, and rare insect and spider species**.
- As the **first woman Director of Kaziranga**, Dr. Ghosh has emphasized:
 - **Human-wildlife coexistence** through local participation
 - **Technology-driven monitoring**, including drone surveillance and digital mapping
 - **Habitat restoration** in flood-prone and erosion-affected zones

- **Community awareness and education** to reduce poaching and promote ecotourism
- Her leadership has strengthened the park's reputation as a **model of adaptive management**, balancing conservation imperatives with livelihood security for surrounding communities.

Global Context and Comparative Significance

- Dr. Ghosh's recognition alongside **Roque Simón Sevilla Larrea** of Ecuador underscores the global relevance of **sustainable conservation economics**—where environmental protection aligns with community welfare and responsible business practices.
- While Larrea's contribution lies in integrating sustainability into **private enterprise and policy**, Dr. Ghosh's innovation demonstrates how **grassroots participation, scientific rigor, and gender-inclusive leadership** can transform biodiversity hotspots into living laboratories of resilience and sustainability.



(Image Source: Kaziranga National Park)

Broader Implications

This achievement carries multiple implications for India and global conservation efforts:

- **Recognition of India's Conservation Ethos:** Reinforces India's standing as a leader in community-based conservation

and wildlife management.

- **Inspiration for Women in Conservation:** As the first woman Director of Kaziranga and first Indian recipient of the award, Dr. Ghosh's success inspires greater gender representation in environmental leadership.
- **Validation of Traditional Knowledge Systems:** Demonstrates that indigenous wisdom, when integrated with modern science, can enhance ecological sustainability.
- **Strengthening India's Global Voice:** Enhances India's soft power and credibility in international climate and biodiversity negotiations, including frameworks like the **Kunming-Montreal Global Biodiversity Framework (2022)**.

Conclusion:

- Dr. Sonali Ghosh's recognition with the **IUCN Kenton R. Miller Award** is more than an individual accolade—it represents a **paradigm shift** in conservation thought and practice in India.
- By intertwining **science, community, and sustainability**, her work exemplifies how protected area management can evolve beyond preservation to become a **dynamic, participatory, and resilient system**.

DNA-based census of wild elephants in India

Source: The Hindu

UPSC Relevance: GS 3 Environment and Ecology

Context: DNA-based elephant census (2025)

Why in News?

India's first DNA-based elephant census (2025) shows an 18% population decline, setting a new scientific baseline for conservation.

Introduction

- India's first-ever **DNA-based census of wild elephants**, conducted under the **All-India Synchronous Elephant Estimation (SAIEE) 2025**, has revealed a sharp **18% decline** in the country's elephant population since 2017.
- The new scientific exercise marks a significant shift from traditional counting methods to **genetic identification**, providing a more accurate and evidence-based understanding of elephant numbers and distribution.

Key Findings

- **Estimated Population (2025):** 22,446 elephants
- **2017 Estimate:** 27,312 elephants
- **Decline:** ~18%
- **Range Estimate (Confidence Interval):** 18,255 – 26,645
- **Survey Period:** Began in 2021; report released in October 2025

Regional Distribution

- The study provides a detailed regional picture of elephant populations across India's four major landscapes:

Region	Estimated Elephants (2025)	Key States
Western Ghats	11,934	Karnataka, Kerala, Tamil Nadu
North Eastern Hills & Brahmaputra Floodplains	6,559	Assam, Arunachal Pradesh, Meghalaya,

		Nagaland, Tripura
Shivalik Hills & Gangetic Plains	2,062	Uttarakhand, Uttar Pradesh
Central India & Eastern Ghats	1,891	Odisha, Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra

- **State-wise Highlights:**
 - **Karnataka:** 6,013 (largest population)
 - **Assam:** 4,159
 - **Tamil Nadu:** 3,136
 - **Kerala:** 2,785
 - **Uttarakhand:** 1,792
 - **Odisha:** 912
 - **Madhya Pradesh:** 97; **Maharashtra:** 63 (tiny, fragmented herds)

Methodology: A Scientific Breakthrough

- The 2025 exercise represents a methodological leap from earlier visual counts to **DNA fingerprinting**, integrating technology and field science.
- **Three-Phase Process**
 - **Field Surveys (Ground-Based):**
 - Conducted using the **M-Stripes app** for systematic data recording.
 - Covered **6.7 lakh km of forest trails** and recorded **3.1 lakh dung plots**.
 - **Habitat Mapping (Satellite Analysis):**
- Used satellite imagery to assess vegetation quality, human footprint, and habitat fragmentation.
- **Genetic Analysis (DNA Fingerprinting):**
 - Collected **21,056 dung samples** across landscapes.
 - Extracted DNA to identify **4,065 unique elephants**.
 - Applied the **mark-recapture model**

to estimate the total population.

- This integrated approach minimized **double-counting** and ensured scientific accuracy, making it the **most reliable elephant census** in India's history.

Reasons for the Decline

The 18% population drop reflects multiple ecological and anthropogenic pressures:

- **Habitat Loss and Fragmentation:** Expansion of agriculture, urbanization, and infrastructure (roads, railways, dams) have disrupted elephant corridors.
- **Human-Elephant Conflict:** Increasing encroachment into elephant habitats has led to crop depredation, property damage, and retaliatory killings.
- **Poaching and Illegal Capture:** Though less frequent, tusk poaching and illegal trade continue to threaten isolated populations.
- **Climate and Ecological Stress:** Changes in rainfall patterns and forest degradation reduce food and water availability.
- **Genetic Isolation:** Fragmented herds (especially in Central India) face inbreeding risks and reduced reproductive success.

Significance of the DNA-Based Count

- **Scientific Accuracy:** Moves away from subjective visual estimation to genetic evidence.
- **New Baseline for Monitoring:** Establishes 2025 as a reference year for future elephant conservation efforts.
- **Policy Implications:** Enables targeted interventions in states and regions showing population decline.
- **Global Benchmark:** Positions India as a pioneer in using **molecular ecology** for

large mammal population studies.

DNA and Its Role in Wildlife Monitoring

- **Deoxyribonucleic acid (DNA)** is the hereditary material present in almost all living organisms. It carries the genetic information that determines an individual's unique traits.
- In wildlife monitoring, DNA is a **powerful tool for identifying individual animals**, assessing their genetic diversity, and understanding genetic health.

Advantages of DNA-Based Wildlife Monitoring

- **Scientific Precision:** Reduces errors from visual counting or indirect signs.
- **Non-Invasive:** Only dung or hair samples are needed; no direct contact with animals.
- **Long-Term Monitoring:** Establishes a **baseline** for future population and genetic studies.
- **Conservation Impact:** Helps in planning corridors, anti-poaching strategies, and habitat restoration.

Global and Ecological Context

- The **Asian elephant (*Elephas maximus*)** is listed as **Endangered** under the **IUCN Red List** and **Schedule I** of India's **Wildlife Protection Act, 1972**.
- India's success or failure in conserving its elephants directly affects the species' **global survival prospects**.
- The 2025 findings **echo similar challenges across South and Southeast Asia**, where elephant ranges are **shrinking amid rapid human expansion**.

Conservation and Policy Implications

- India hosts over **60% of the world's remaining Asian elephants**, making conservation efforts crucial for global biodiversity. The 2025 estimation underscores the need for **revamped conservation strategies** under **Project Elephant (1992)** and allied programmes.

Key Policy Recommendations

- **Strengthen Elephant Corridors:** Prioritize the protection of **101 identified elephant corridors** through eco-sensitive zoning and community participation.
- **Integrate Landscape-Level Planning:** Balance infrastructure development with ecological connectivity using tools like **Wildlife Passage Plans**.
- **Enhance Conflict Mitigation:** Expand **early-warning systems**, crop insurance, and community-based compensation models.
- **Promote Genetic Health:** Facilitate translocation and corridor connectivity to prevent inbreeding.
- **Community and Tribal Involvement:** Engage local communities in conservation, especially in regions like Odisha, Assam, and Karnataka.
- **Use of Technology:** Expand use of **AI-based monitoring, camera traps, and satellite telemetry** for real-time tracking.

Conclusion:

- The 2025 DNA-based elephant census marks a **turning point in India's wildlife monitoring framework**. While the decline in numbers is a warning signal, the adoption of cutting-edge genetic technology offers hope for a more accurate, data-driven conservation policy. To secure the future of India's elephants — symbols of ecological wisdom and cultural heritage — policymakers must now **translate science into sustained conservation action**.

IUCN Lists Western Ghats, Manas and Sundarbans National Parks under 'Significant Concern' Category

Source: The Hindu

UPSC Relevance: GS3 Environment and Ecology

Context: IUCN Lists Western Ghats

Why in News?

The IUCN World Heritage Outlook 2025 has downgraded the conservation status of India's Western Ghats, Manas, and Sundarbans National Parks.



(Image Source: The Hindu)

Introduction

- The International Union for Conservation of Nature (IUCN) has placed India's Western Ghats, Manas National Park (Assam), and Sundarbans National Park (West Bengal) under the category of "Significant Concern" in its latest World Heritage Outlook 4 report (2025).
- This assessment highlights increasing environmental stress and management challenges faced by several of India's natural UNESCO World Heritage Sites.

About the IUCN World Heritage Outlook

- The IUCN World Heritage Outlook is a global assessment of the conservation status of all natural World Heritage sites.
- It evaluates each site based on three key parameters:
- **Values** – the natural significance of the site;
- **Threats** – pressures impacting the site;
- **Management** – effectiveness of protection and management efforts.
- The fourth edition (2025) assessed 63 natural World Heritage sites across Asia (excluding Arab countries).

Conservation Outlook Categories

Category	Meaning	Percentage of Sites

(Asia)		
Good	Site values are well preserved and maintained.	17%
Good with some concerns	Site is generally well managed, but some threats exist.	51%
Significant concern	Site faces serious threats that could deteriorate its values.	30%
Critical	Site values are severely threatened and may be irreversibly lost.	2%

- Notably, the Tropical Rainforest Heritage of Sumatra (Indonesia) is the only Asian site rated "Critical" in 2025.

Indian Sites under Each Category

1. 'Good'

- Khangchendzonga National Park (Sikkim) – Only Indian site rated "good", and among 11 in Asia.
- Recognized for strong conservation measures, limited human disturbance, and community participation in eco-tourism.

2. 'Good with Some Concerns'

- Great Himalayan National Park Conservation Area (Himachal Pradesh)
- Kaziranga National Park (Assam)
- Keoladeo National Park (Rajasthan)
- Nanda Devi and Valley of Flowers National Parks (Uttarakhand)

3. 'Significant Concern'

- Western Ghats
- Manas National Park (Assam)
- Sundarbans National Park (West Bengal)

Reasons for “Significant Concern” Status

1. Western Ghats

- **Loss of Evergreen Forest Cover:** Recent analyses show a **5% decline** in evergreen forest area.
- **Threats:** Encroachment, infrastructure development (roads, railways), mining, and hydropower projects.
- **Biodiversity Impact:** Habitat fragmentation threatens endemic species like the lion-tailed macaque and Malabar civet.

2. Manas National Park (Assam)

- **Transboundary Ecosystem:** Extends into Bhutan (Royal Manas National Park).
- **Challenges:** Poaching, encroachment, invasive species, and developmental pressures in buffer zones.
- **Recovery:** Although the park has shown signs of improvement after past disturbances, long-term sustainability remains uncertain.

3. Sundarbans National Park (West Bengal)

- **Transboundary Region:** Shared with Bangladesh’s Sundarbans Reserve Forest.
- **Major Threats:**
- **Rising sea levels and salinity** due to **climate change**.
- **Mangrove degradation** from human settlements and shrimp farming.
- **Cyclones and coastal erosion** causing habitat loss for species like the Bengal tiger.

Major Findings of the 2025 Outlook

1. Increasing Threats

- **Climate change** has replaced **hunting** as the **most prevalent threat** in 2025.
- **Tourism pressure** remains the **second biggest threat**, while **invasive alien species** have emerged as the **third**, replacing other older concerns.

- **Infrastructure expansion** (roads and railways) is now among the **top five threats**, reflecting urban and agricultural encroachment.

2. Drivers of Habitat Loss

- **Rapid land use change** for agriculture and urban expansion.
- **Deforestation, roadkill, waste dumping, illegal logging, and forest fires** even within protected zones.
- **Tourism-linked pressures** increasing in fragile ecosystems.

3. Declining Management Effectiveness

Management Effectiveness (Asia)	2020	2025
Highly effective	5%	3%
Mostly effective	48%	46%
Some concern	43%	49%
Serious concern	4%	2%

- While the number of sites under “*serious concern*” has slightly declined, those under “*some concern*” have **increased by 6%**, indicating growing challenges in site management.

Positive Practices Highlighted

The report cites examples of **community engagement and youth involvement** in conservation from:

- **Mount Wuyi (China)** – education-based eco-awareness programmes.
- **Sinharaja Forest Reserve (Sri Lanka)** – integrating local communities in forest protection.
- Such models are recommended for replication in South Asian World Heritage sites.

India’s Broader Conservation Challenge

- India, with **seven natural World Heritage sites**, faces mounting ecological pressures due to:
- **Population density** near protected zones,
- **Developmental activities** like mining, roads, and tourism, and
- **Climate-induced events** (floods, cyclones, forest fires).
- These highlight the urgent need for **better inter-state coordination, community-based conservation, and ecologically sensitive tourism policies.**

Conclusion:

- The IUCN's *World Heritage Outlook 2025* serves as a **critical environmental warning** for India. While the country continues to perform well in protecting some natural sites such as **Khangchendzonga**, others like the **Western Ghats, Manas, and Sundarbans** demand **urgent and targeted conservation interventions.**

Sundarbans Aquaculture Model Wins FAO Global Recognition

Source: The Hindu

UPSC Relevance: GS 3 Environment and Ecology

Context: Sundarbans

Why in News?

The Sustainable Aquaculture in Mangrove Ecosystems (SAIME) model developed by the Nature Environment and Wildlife Society (NEWS) in West Bengal's Sundarbans received Global Technical Recognition from the Food and Agriculture Organization (FAO).

Introduction

- In a landmark recognition of India's innovative approach to sustainable

development, the **Food and Agriculture Organization (FAO)** of the United Nations has conferred **Global Technical Recognition** upon the **Sustainable Aquaculture in Mangrove Ecosystems (SAIME)** model developed by the **Nature Environment and Wildlife Society (NEWS).**

- The award was presented on **October 15, 2025**, during the FAO's **80th Anniversary Celebrations and World Food Forum** in Rome, Italy.
- This recognition highlights India's commitment to **climate-resilient livelihoods, mangrove conservation, and sustainable aquaculture**—particularly in ecologically fragile regions like the Sundarbans.



(Image Source: The Hindu)

About the SAIME Model

- The **Sustainable Aquaculture in Mangrove Ecosystems (SAIME)** model was conceptualized and implemented by the **Nature Environment and Wildlife Society (NEWS)**, a Kolkata-based non-governmental organisation (NGO), in the **Sundarbans delta of West Bengal.**

Core Concept:

- SAIME integrates **aquaculture** (particularly shrimp farming) with **mangrove restoration** to create a **win-win model** for both ecology and economy. It seeks to:
- Conserve mangroves,

- Ensure sustainable fish/shrimp production, and
- Strengthen coastal community livelihoods in the face of **climate change-induced sea-level rise**.

Key Features of the SAIME Model

Mangrove-Linked Aquaculture Design

- Each aquaculture pond under the SAIME model maintains **5%-30% mangrove coverage**.
- Mangroves are planted around pond dykes and shallow zones.
- Their roots stabilize soil, reduce erosion, and improve water quality.
- The mangrove litter (leaves and organic matter) serves as **natural fodder**, reducing dependence on chemical feed.

Community-Based Implementation

- The project covers **29.84 hectares** of farm area involving **42 fish farmers** across **Chaital (North 24 Parganas)** and **Madhabpur (South 24 Parganas)** districts.
- The approach is **participatory**, involving local fishers and communities in decision-making and monitoring.
- Training is provided on **Good Aquaculture Practices (GAPs)** and **ecosystem-based management**.

Economic and Ecological Outcomes

- **Farmers' net profits increased by over 100%**, largely due to reduced feed and chemical costs.
- The model supports **chemical-free shrimp farming**, particularly of **Black Tiger Shrimp (*Penaeus monodon*)**.
- It enhances **carbon sequestration, biodiversity, and coastal resilience** against cyclones and saline intrusion.

Significance of the Model

1. Climate Adaptation and Resilience

- The Sundarbans, a UNESCO World Heritage Site, faces severe threats from **rising sea levels, coastal erosion, and frequent cyclones**. By integrating mangroves with aquaculture:
- The SAIME model helps **stabilize coastlines**,
- Acts as a **natural barrier** against storm surges, and
- Mitigates the impacts of **climate change**.

2. Sustainable Livelihoods

- Traditional shrimp monoculture is **input-intensive and environmentally degrading**. SAIME provides an **eco-friendly alternative**, reducing input costs and providing **stable income** to marginal farmers.

3. Biodiversity Conservation

- Mangroves act as **nurseries for fish, crabs, and shrimps**, enhancing local biodiversity. They also store "**blue carbon**" – carbon captured by oceanic and coastal ecosystems – contributing to India's **Nationally Determined Contributions (NDCs)** under the **Paris Agreement**.

4. Replicable and Scalable Model

- Experts consider SAIME a **replicable model** for other tropical deltaic regions like **Andhra Pradesh, Odisha, and Southeast Asia**, where aquaculture and mangroves coexist.

FAO's Global Technical Recognition

The FAO's recognition validates SAIME as a **global best practice** in:

- **Ecosystem-based aquaculture,**
- **Community participation,** and
- **Sustainable coastal management.**
- It aligns with FAO's global agenda on:
- **Blue Transformation Initiative** – promoting sustainable aquaculture,
- **Climate-Smart Agriculture,** and

- **Sustainable Development Goals (SDGs)**, particularly:
 - **SDG 13:** Climate Action
 - **SDG 14:** Life Below Water
 - **SDG 15:** Life on Land
 - **SDG 1 & 2:** No Poverty and Zero Hunger

Policy Relevance for India

The success of SAIME holds important lessons for India's **Blue Economy Vision 2047** and **National Fisheries Policy**:

- Encourages **nature-based solutions (NbS)** for livelihood security.
- Strengthens India's role in **sustainable aquaculture** and **mangrove conservation**.
- Can be integrated into **coastal zone management plans**, **Fisheries and Aquaculture Infrastructure Development Fund (FIDF)**, and **MANGROVE Initiative for Shoreline Habitats & Tangible Incomes (MISHTI)** launched under the Union Budget 2023-24.

Challenges and the Way Forward

- Despite its success, scaling up the model faces certain challenges:
- Need for **larger institutional support** and **financial incentives**.
- **Monitoring and enforcement** to prevent land-use changes due to unsustainable shrimp farming.
- Strengthening **community capacity building** and ensuring **market access** for sustainably farmed shrimp.
- **Way Forward:**
 - Integrate SAIME principles into **national coastal development schemes**.
 - Promote **carbon credit mechanisms** for mangrove-linked aquaculture.
 - Establish **public-private**

partnerships (PPP) for large-scale replication.

- Encourage **research and innovation** in climate-resilient aquaculture.

Conclusion:

- The FAO's global recognition of the **SAIME model** reaffirms India's capability to harmonize **economic development** with **ecological conservation**.

Alarming Surge in CO₂ and Greenhouse Gases Highlights Deepening Climate Crisis

Source: Down To Earth

UPSC Relevance: GS3 Environment and Ecology

Context: Rise in Greenhouse Gases

Why in News?

The WMO 2024 report highlights record increases in CO₂, methane, and nitrous oxide levels, driven by human activities, wildfires, and reduced carbon sink efficiency.

Background

- **World Meteorological Organization (WMO)** released its **Greenhouse Gas Bulletin** on October 16, 2025, revealing that **carbon dioxide (CO₂)** and **other warming gases** reached record levels in 2024.
- This signals an **accelerating climate crisis**, driven by human activities, wildfires, and reduced efficiency of natural carbon sinks. The report comes just ahead of the **30th Conference of Parties (COP30)** to the **UN Framework Convention on Climate Change (UNFCCC)** in Belem, Brazil, highlighting

the urgent need for **policy action at the global level.**



(Image Source: Down To Earth)

Carbon Dioxide (CO₂) and Climate Change

- Carbon dioxide (CO₂) is a naturally occurring **greenhouse gas** in the Earth's atmosphere that plays a critical role in regulating the planet's temperature by trapping heat — a phenomenon known as the **greenhouse effect**.
- While natural processes maintain a balance, **human activities have dramatically increased CO₂ concentrations**, leading to global warming and climate change.
- **Sources of CO₂**
 - a) **Natural Sources:**
 - Respiration of plants and animals
 - Volcanic eruptions
 - Decomposition of organic matter
 - Ocean-atmosphere exchange
 - b) **Anthropogenic Sources:**
 - **Fossil fuel combustion** (coal, oil, natural gas) for electricity, transport, and industry
 - **Deforestation**, which reduces CO₂ absorption by forests
 - Industrial processes (cement, steel production)
 - Biomass burning
- **CO₂ and Global Warming**
 - CO₂ traps **infrared radiation** emitted from Earth's surface, preventing it from escaping into

space.

- Increased CO₂ levels intensify the **greenhouse effect**, leading to a rise in **global average temperatures**.
- According to the **WMO 2024 Greenhouse Gas Bulletin**, CO₂ concentrations reached **423.9 ppm**, a record high, signaling accelerated warming.

Key Findings of the WMO Report

CO₂ Levels Surged:

- Global CO₂ concentration reached **423.9 ppm** in 2024, up from **377.1 ppm** in 2004, marking a **12.5% rise in 20 years**.
- The **annual increase from 2023 to 2024 was 3.5 ppm**, the **largest jump since modern measurements began in 1957**.
- Since the 1960s, the **CO₂ growth rate has tripled**, from **0.8 ppm/year** to **2.4 ppm/year** during 2011–2020.

Causes of Record Increase:

- **Human emissions:** Fossil fuel combustion, industrial activity, and deforestation continue to contribute significantly to atmospheric CO₂.
- **Wildfires:** Large-scale fires in **Amazon and southern Africa** in 2024 released substantial amounts of CO₂.
- **Reduced carbon sink efficiency:** **Land and ocean carbon sinks** absorbed less CO₂ due to **droughts, dry vegetation, and warming temperatures**, exacerbated by **El Niño**, which makes vegetation less effective at sequestering carbon.

Other Greenhouse Gases Rising:

- **Methane (CH₄):** Accounts for **~16%** of the warming effect. About **60% of methane emissions** are anthropogenic, including cattle, rice farming, fossil fuel use, landfills, and biomass burning; **40%** is from natural sources like wetlands.

- **Nitrous oxide (N₂O):** The global average reached 338 ppb in 2024, a **25% increase over pre-industrial levels**. Nitrous oxide has a **long atmospheric lifetime** and contributes significantly to the **greenhouse effect**.

Impact of El Niño on Greenhouse Gas Emissions

- **El Niño events** reduce the efficiency of terrestrial carbon sinks, leading to higher CO₂ concentrations.
- The **2024 El Niño** contributed to **exceptional warming, drought, and wildfires**, further elevating greenhouse gas levels.
- These phenomena create a **“vicious climate cycle”**, where higher greenhouse gases intensify warming, triggering **more extreme weather events** such as heatwaves, floods, and cyclones.

Implications for Climate Change and Policy

Global Warming:

- Rising greenhouse gas concentrations **trap heat in the atmosphere**, causing **temperature rise, altered precipitation patterns, and extreme weather events**.
- Long-term climate impacts include **sea-level rise, glacial retreat, biodiversity loss, and threats to agriculture and water security**.

Economic and Social Consequences:

- Extreme weather events can **disrupt agriculture, infrastructure, and livelihoods**, posing risks to **food security and economic stability**.
- Climate change disproportionately affects **vulnerable communities**, requiring both **mitigation and adaptation strategies**.

Urgent Need for Action:

- The WMO report emphasizes the **critical need to reduce greenhouse gas emissions globally**, particularly from industrialized nations.
- Strengthening **greenhouse gas monitoring**, expanding **renewable energy adoption**, and improving **land-use and forestry practices** are essential measures.

Role of International Conferences:

- The report provides **authoritative scientific evidence** ahead of COP30, guiding policymakers toward actionable climate strategies.
- Effective policies must **address both emissions reduction and enhancement of carbon sinks**, including oceans and forests.

Conclusion:

- The WMO report underscores that the world is **on an accelerated path of climate warming** due to unprecedented rises in CO₂ and other greenhouse gases.

Punjab's Stubble Burning: Fewer Fires, But Larger Burnt Areas Reveal Hidden Challenge

Source: The Hindu

UPSC Relevance: GS 3 Environment and Ecology, Air pollution

Context: Stubble burning issue

Why in News?

Punjab reports fewer stubble-burning incidents, but total burnt area remains large, highlighting limitations of satellite detection and continued environmental risk.

Background

- Every year, post-harvest stubble burning in Punjab emerges as a significant

environmental issue, contributing to severe air pollution in northern India, including Delhi-NCR.

- Paddy harvesting leaves behind crop residue that farmers often burn to prepare fields for the next wheat crop.
- The short window of approximately three weeks between paddy harvesting and wheat sowing makes stubble burning a prevalent practice despite awareness of its environmental impact.

Current Scenario

- In 2025, the number of reported stubble-burning incidents in Punjab appears relatively lower than previous years. This reduction is partly attributed to **severe floods**, which left large portions of farmland submerged. The government has claimed a substantial decline in incidents due to measures such as stricter enforcement of burning bans and provision of subsidized machinery for crop residue management.

Data Discrepancy

- Punjab government data, aggregated from satellites, indicates 10,909 farm fire cases in 2024, compared to 36,663 in 2023, marking a 70 percent decline. However, the total area affected by residue burning has largely remained constant, with 19.17 lakh hectares burned in 2024 compared to 19.14 lakh hectares in 2023.
- Earlier years, 2021 and 2022, recorded approximately 15.60 lakh and 15.40 lakh hectares, respectively.
- This discrepancy suggests that while the **number of fires has reduced**, the **total burnt area has not decreased**, implying larger or more intense burns in certain locations or underreporting of small-scale burns.

Challenges in Data Accuracy

- Satellite-based fire detection relies on **thermal imaging** to identify heat signatures. However, several limitations exist:
- Satellites like **MODIS** and **VIIRS** pass over the region only a few times a day, potentially missing late afternoon or evening fires.
- Weather conditions such as **clouds and haze** can obstruct detection.
- Small and fragmented landholdings lead to short-duration or partial fires, which are difficult to detect.
- Farmers may intentionally time or cover fires to avoid detection.
- Advancements in **remote sensing**, including **optical sensors like Sentinel-2**, allow for the identification of post-fire discoloration and burn scars, providing more accurate estimates of the total burnt area. Experts recommend integrating **thermal and optical satellite data** with **systematic ground verification** to improve assessment accuracy.

Environmental Implications

- A higher burnt area does not automatically translate to increased pollution. Many of the burns are **low-intensity and partial**, releasing less particulate matter and gaseous emissions than large-scale fires.
- Accurate evaluation of emissions should consider **fire intensity, fuel load, and duration**, rather than relying solely on the area affected.

Root Causes of Stubble Burning

Farmers continue to burn crop residue due to:

- **Time constraints** between paddy harvesting and wheat sowing.
- **High cost and limited access** to crop

residue management machinery.

- **Labour shortages** during the peak harvest season.
- **Fragmented landholdings**, making mechanized solutions challenging.
- Limited **economic incentives** for sustainable residue management or biofuel conversion.



(Image Source: The Hindu)

Government Initiatives

Efforts to curb stubble burning include:

- Provision of subsidized machinery like the **Happy Seeder** and **Super Straw Management System**.
- Financial incentives for adopting **in-situ management** practices.
- Awareness campaigns and stricter enforcement of burning bans.
- Promotion of ex-situ usage of crop residue in bioenergy plants, composting units, and other industries.

Technological Measures to Reduce Stubble Burning

- **Happy Seeder:** Tractor-mounted device that sows wheat directly into paddy fields while cutting straw, avoiding burning, saving time, lowering costs, and improving soil health.
- **Pusa Decomposer:** Microbial formulation that breaks down paddy stubble into compost, enhancing soil fertility and reducing the need to burn residues.

- **Crop Residue Pelletization:** Converts residues into biomass pellets for energy, reducing burning and providing extra income to farmers.
- **Biochar Production:** Pyrolysis of crop residues produces biochar, improving soil fertility, water retention, microbial activity, and aiding carbon sequestration.

Way Forward

- **Improved Monitoring:** Combine thermal and optical satellite observations with systematic ground verification for accurate fire and burnt-area assessment.
- **Sustainable Agriculture Practices:** Promote crop diversification, direct-seeded rice, and alternate wetting and drying methods to reduce paddy area and residue.
- **Economic Incentives:** Provide market linkages for crop residue, carbon credits, or subsidies to encourage adoption of non-burning practices.
- **Machinery Accessibility:** Strengthen last-mile delivery through custom hiring centres for small and marginal farmers.
- **Regional Cooperation:** Coordinate with neighboring states to implement joint action plans and share real-time data to tackle cross-border air pollution.

Conclusion:

- Although the **number of stubble-burning incidents** in Punjab has decreased, the **total burnt area remains significant**, indicating that the problem persists. Satellite limitations and ground realities suggest that official data may **underestimate the true extent**.
- Addressing the issue requires a combination of **accurate monitoring, economic support for farmers, and sustainable agricultural transformation**.

to reduce environmental and health impacts in northern India.

Air Pollution and Disease Burden in India – SoGA 2025 Report

Source: The Hindu

UPSC Relevance: GS3 Environment and Ecology

Context: Air Pollution

Why in News?

SoGA 2025 reports that air pollution in India caused 2 million deaths in 2023, largely from NCDs, with emerging evidence linking it to dementia.

Introduction

- The Air pollution has long been recognised as a major environmental hazard, but the **State of Global Air (SoGA) 2025** report by the Health Effects Institute (HEI) and the Institute for Health Metrics and Evaluation (IHME), USA, highlights its increasingly alarming impact on **public health in India**.

The report reveals that nearly **two million deaths in India in 2023** were attributable to air pollution-related diseases, marking a **43% increase** from 1.4 million in 2000. A significant proportion of these deaths – **almost 90%** – are linked to **non-communicable diseases (NCDs)** such as heart disease, lung cancer, diabetes, and **dementia**.

- This signals a paradigm shift: while infectious diseases once dominated India's health burden, **chronic and degenerative diseases driven by environmental factors** are now emerging as the primary threat.

Magnitude of Air Pollution's Impact in India

Comparison with high-income countries

- India's air pollution-related death rate stands at **186 per 100,000 people**, over **10 times higher** than high-income countries (17 per 100,000).
- States most affected include **Maharashtra, Uttar Pradesh, Rajasthan, Bihar, and West Bengal**, each reporting over 100,000 deaths in 2023.

Air pollution and non-communicable diseases

- 89% of air pollution deaths** in India are attributable to NCDs.
- Air pollution contributes to:
 - 70% of COPD deaths
 - 33% of lung cancer deaths
 - >25% of heart disease deaths
 - ~20% of diabetes deaths
- This indicates a **rising risk for India's ageing population**, with long-term exposure to PM2.5 significantly affecting cardiovascular and respiratory systems.

Global context

- Worldwide, air pollution causes **8 million deaths annually**; 4.9 million from outdoor pollution, 2.8 million from household pollution, and the rest from ozone exposure.
- Deaths from air pollution-related NCDs in adults over 60 account for **95% globally**, highlighting the **vulnerability of the elderly**.
- Household vs ambient pollution**
- Deaths from **household air pollution** (solid fuel use for cooking) have declined in India.
- However, deaths from **ambient PM2.5 and ozone pollution** have **increased**, with **75% of India's population exposed** to PM2.5 levels above the WHO Air Quality Interim Target of 35 µg/m³.

Air Pollution and Dementia: A New Front in Public Health

- **Global evidence**
- SoGA 2025 highlights a **direct link between air pollution and dementia**, with **626,000 global deaths** and **40 million healthy life years lost** due to long-term exposure to fine particulate matter (PM_{2.5}).
- Studies suggest that **PM_{2.5} may damage brain tissue**, accelerate cognitive decline, and increase susceptibility to degenerative brain diseases.

India's situation

- Dementia-related deaths linked to air pollution reached **54,000 in 2024**.
- **Women** are disproportionately affected — both as caregivers and in terms of higher risk for developing dementia.
- With **rising life expectancy** and **underdeveloped elderly care systems**, dementia poses a growing burden on healthcare infrastructure and families.

Regional and Socio-Economic Imperatives

Vulnerability of LMICs

- Low- and middle-income countries (LMICs), including India, face heightened risk due to **rapid industrialisation, industrial emissions, urbanisation, and limited healthcare access**.
- South Asia, particularly India, remains **the worst-affected region globally**.

Policy recognition

- The **UN High-Level Meeting on NCDs (2018)** recognised air pollution as a major risk factor alongside **tobacco, unhealthy diets, physical inactivity, and harmful alcohol consumption**.
- The **World Health Assembly** integrated air pollution into the global NCD framework.

- Despite this, progress in India has been **uneven**, and **SDG 3.4** — to reduce premature NCD deaths by one-third by 2030 — may remain out of reach without **strong air pollution control measures**.



(Image Source: Down To Earth)

Integrated Action Needed

Health and environment synergy

- Controlling air pollution presents a **dual opportunity**:
- Reduces NCD and dementia risk
- Supports **climate mitigation, energy efficiency, and productivity gains**

Policy measures

- Coordinated efforts across **health, environment, transport, and energy sectors** are critical.
- Interventions may include:
- Phasing out coal and promoting **clean energy**
- Reducing vehicular and industrial emissions
- Expanding **green urban infrastructure**
- Integrating **air quality monitoring with public health planning**

Public awareness and preventive care

- Public campaigns to reduce exposure to **PM_{2.5} and ozone**
- Early screening for NCDs and cognitive decline in high-risk populations
- Community-based support for elderly care and caregivers

Conclusion:

- The SoGA 2025 report underscores that **air pollution is no longer just an environmental issue; it is a critical public health emergency** in India. Chronic exposure to pollutants is **worsening NCDs** and emerging as a significant risk factor for **dementia**, particularly among the elderly. With **75% of the population exposed to harmful PM2.5 levels**, the need for **urgent, integrated, and sustained policy action** is clear.

India at the Epicentre of Global Air Pollution Deaths: Lancet Countdown 2025 Report

Source: New Indian Express

UPSC Relevance: GS 3 Environment and Ecology

Context: Lancet Countdown 2025 Report

Why in News?

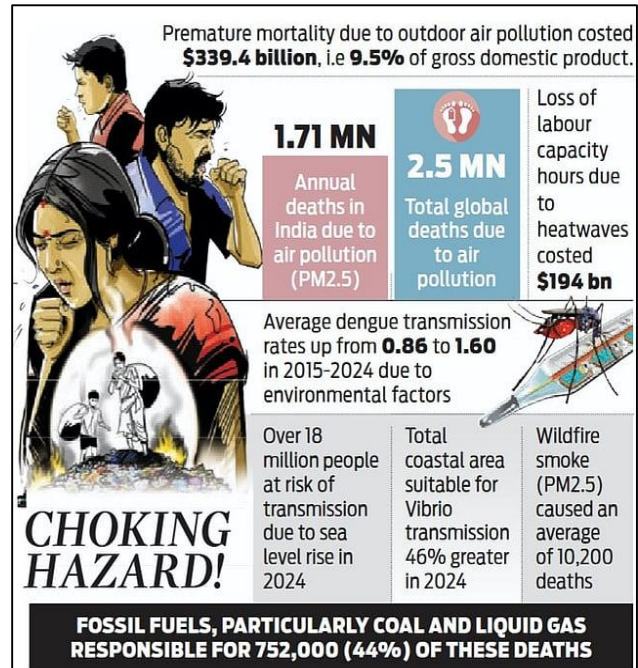
According to the Lancet Countdown 2025 Report, India accounts for around 70% of global air-pollution-related deaths

Introduction

- The 2025 *Global Report of the Lancet Countdown on Health and Climate Change*, prepared by **University College London** in partnership with the **World Health Organization (WHO)**, has sounded a grave warning for India.
- It states that India alone accounts for **around 70% of global deaths** caused by air pollution, marking the country as the epicentre of a global public health and environmental crisis.
- This alarming statistic not only reflects the deteriorating air quality but also underlines the intersection of public

health, energy dependence, and climate vulnerability.

- The report urges urgent, multi-sectoral interventions in fossil fuel usage, urban governance, and climate resilience policies.



(Image Source: New Indian Express)

Scale and Magnitude of Air Pollution in India

- According to the report, **India witnesses 1.72 million deaths annually** due to anthropogenic (human-caused) air pollution — primarily from **fine particulate matter (PM2.5)**.
- This represents a **38% increase since 2010**, while the **global total stands at 2.5 million deaths per year**.
- PM2.5 refers to particulate matter smaller than 2.5 microns, which penetrates deep into the lungs and bloodstream, leading to cardiovascular, respiratory, and neurological disorders.

Fossil Fuels as the Core Cause

- The *Lancet Countdown 2025* attributes **44% of air pollution-related deaths (7.52**

lakh annually) to fossil fuel combustion, breaking it down as follows:

- **Coal** → 394,000 deaths
- Of which, **298,000 deaths** are linked directly to **coal-based power generation**.
- **Petrol and Diesel** → 269,000 deaths
- Mainly from **road transportation** and vehicular emissions.
- **Liquid gas and other fuels** → Remaining share of deaths.
- The heavy reliance on **coal-based power plants**, especially in northern and eastern India, continues to make air pollution a structural issue embedded in India's energy economy.

The Rising Threat from Wildfire Smoke and Household Pollution

Beyond fossil fuels, **wildfire smoke** and **household fuels** have emerged as significant contributors:

- **Wildfire smoke (PM2.5)** caused an average of **10,200 deaths annually** from 2020–2024 – a **28% increase** from the previous decade (2003–2012).
- **Household air pollution** led to an average of **113 deaths per 100,000 people** in 2022.
- Rural mortality rate: **125 per 100,000**
- Urban mortality rate: **99 per 100,000**
- This indicates the **urban-rural divide** in access to clean cooking fuels, despite initiatives such as the *Pradhan Mantri Ujjwala Yojana (PMUY)*.

Economic Burden of Air Pollution

- The report estimates that **premature mortality due to outdoor air pollution** cost India **\$339.4 billion in 2022**, equivalent to **9.5% of GDP**.
- Such a massive economic burden reflects:

- Loss of productivity and labour hours.
- Increased healthcare costs.
- Reduced agricultural output due to pollution-induced soil degradation.
- This makes air pollution not just a health issue, but a **macroeconomic and developmental challenge**.

Climate Change Interlinkages: Heatwaves, Drought, and Disease Spread

The *Lancet Countdown 2025* goes beyond pollution to show **climate-health interconnections**:

(a) Rising Heatwaves and Labour Productivity Loss

- Indians experienced **50% more heatwave days in 2024**, with **366 extra hours** of exposure per person.
- This resulted in **419 lost labour hours per person annually**, which is **124% higher** than in 1990–1999.
- The resultant **income loss** was **\$194 billion in 2024**, particularly in agriculture and construction sectors.

(b) Drought and Ecological Stress

- Areas experiencing **at least one month of extreme drought** each year rose by **138%**, from **14.1% (1951–1960)** to **2015–2024**.
- This intensifies **water stress**, **crop failures**, and **migration pressures**.

(c) Vector- and Water-Borne Disease Surge

- **Dengue transmission potential** from *Aedes albopictus* mosquitoes has **doubled** over the last seven decades.
- **Coastal bacterial diseases** like *Vibrio* infections are **46% higher** than the 1982–2010 baseline.
- Thus, climate-induced air pollution is not only a respiratory threat but also a **driver of infectious disease vulnerability**.

Policy Dimensions and Challenges

a. Gaps in Air Quality Governance

- Despite the **National Clean Air Programme (NCAP)** launched in 2019, India struggles with:
- Weak enforcement of emission standards.
- Poor coordination among Centre, States, and Urban Local Bodies.
- Limited real-time data coverage beyond metro cities.

b. Energy Transition Dilemmas

- While India has committed to **net-zero by 2070**, **coal continues to dominate** energy generation, meeting over 70% of power needs.
- Transitioning to renewables requires large-scale investment and just-transition planning for coal-dependent regions.

c. Public Health Preparedness

- The integration of **climate-health data** into healthcare planning remains limited.
- The *Lancet Countdown* urges **synergising health and environmental policies**, including early warning systems for air quality and heat stress.

The Way Forward

Policy Recommendations

- **Strengthen the NCAP** by introducing legally binding air quality standards.
- **Accelerate renewable energy deployment** while ensuring a **just transition** for fossil-fuel workers.
- **Expand clean cooking initiatives** and ensure equitable energy access in rural India.
- **Integrate climate-health data** into national health missions.
- **Invest in urban green infrastructure** and public transport to cut vehicular

emissions.

- **Enhance inter-sectoral coordination** among energy, environment, and health ministries.

Conclusion:

- The *Lancet Countdown 2025* underscores a stark truth: **India is at the heart of the global air pollution crisis**. The nexus between fossil fuel dependence, climate change, and public health has reached a critical tipping point.

European Union's Proposed Ethanol Ban: Implications and Concerns

Source: New Indian Express

UPSC Relevance: GS3 Environment and Ecology

Context: EU Ethanol Ban

Why in News?

The European Union is considering a de-facto ban on ethanol-based products after the European Chemical Agency raised carcinogenic concerns.



(Image Source: New Indian Exoress)

Introduction

- The European Union (EU) is reportedly considering a **de-facto ban on ethanol-based products** following concerns raised by the **European Chemical Agency (ECHA)** over the potential

carcinogenic risks associated with ethanol exposure.

- The proposal has triggered widespread debate not only in Europe but also in countries like **India**, where ethanol is increasingly used in fuel blending and consumer products such as sanitizers.

Background

- Ethanol (ethyl alcohol) is a **volatile, flammable, and colorless liquid** widely used in industries and daily life. Common applications include:
 - **Hand sanitizers** and disinfectants (especially after the COVID-19 pandemic),
 - **Beverages** (as alcohol content),
 - **Fuel blending** in petrol (to reduce carbon emissions),
 - **Pharmaceutical and cosmetic** manufacturing.

Ethanol Blending

- Ethanol blending refers to the process of **mixing ethanol (ethyl alcohol)**, which is a biofuel produced mainly from **sugarcane, maize, or other biomass**, with **petrol (gasoline)** to create a blended fuel that can be used in vehicles.
- **Purpose:**
 - To **reduce dependence on fossil fuels**,
 - **Cut carbon emissions**, and
 - **Promote renewable energy** and rural income through biofuel production.
- **Example:** An **E20 blend** means **20% ethanol** mixed with **80% petrol**.
- **In India:** Under the **Ethanol Blended Petrol (EBP) Programme**, the government aims to achieve **20% ethanol blending by 2025** to enhance energy security and reduce import

bills. India, through its **Ethanol Blending Programme (EBP)**, aims to achieve **20% ethanol blending in petrol by 2025**, as part of its efforts to reduce fossil fuel dependence and greenhouse gas emissions.

The EU's Concern

- According to reports, the **ECHA** has identified potential **carcinogenic effects** linked to ethanol exposure, primarily citing risks from **acetaldehyde and formaldehyde** – by-products released during the burning of ethanol-blended fuels. These compounds are associated with cancer risk when exposure is **prolonged or at high concentrations**.
- However, the **International Association for Soaps, Detergents and Maintenance Products (AISE)** clarified that the data underpinning these concerns largely come from **oral intake studies** – focusing on **excessive consumption of alcoholic beverages**, not from normal environmental or occupational exposure to ethanol in sanitizers or fuels.

Ethanol in Fuels: The Double-Edged Sword

- The debate becomes more complex in the context of **ethanol-blended fuels**. While ethanol is promoted as a **cleaner and renewable alternative** to fossil fuels, its combustion can lead to:
- **Increased emissions of acetaldehyde and formaldehyde**, both recognized as **carcinogenic compounds**.
- However, ethanol blending also **reduces other toxic emissions**, such as **carbon monoxide (CO)** and certain **hydrocarbons**, thereby potentially improving **overall air quality**.
- Thus, the net environmental and health impact of ethanol fuel depends on the

balance of pollutants produced, the engine technology, and the urban air quality context.

India's Ethanol Policy and its Stakes

- India's ethanol programme is closely tied to:
 - Energy security** – reducing crude oil imports.
 - Environmental sustainability** – promoting biofuels and lowering carbon emissions.
 - Rural economy** – generating demand for sugarcane, maize, and other biofuel crops.
- Any global regulatory shift against ethanol could affect:
 - India's fuel blending goals (E20 by 2025),**
 - Investments in bio-refineries and green energy infrastructure,** and
 - Farmers dependent on ethanol-linked agro-industries.**

Scientific and Regulatory Balance

- While the EU's precautionary stance underscores the importance of **health and safety**, experts warn against **blanket bans** without contextual scientific evidence. Instead, a **risk-based approach** is recommended:
 - Continuous monitoring of emissions and exposure levels,**
 - Technological improvements** in combustion and emission control,
 - Public awareness** on safe handling and usage of ethanol-based products.

Conclusion:

- The proposed EU ethanol ban highlights the **tension between environmental innovation and health safety**. For India, the focus must remain on **evidence-**

based policy decisions, sustainable biofuel development, and ongoing scientific evaluation of risks.

- Ethanol, when used responsibly and regulated effectively, remains a **key transitional fuel** in India's journey toward cleaner energy and sustainable growth.

Rise in Oil & Gas Production, Inadequate Climate Finance

Source: New Indian Express

UPSC Relevance: GS 3 Environment and Ecology

Context: Report on Paris Agreement goals

Why in News?

The Oil Change International (OCI) report "Planet Wreckers: Global North Countries Fueling the Fire Since the Paris Agreement" reveals that developed nations like the US, Australia, Canada, and Norway have expanded fossil fuel production despite their climate pledges.



(Image Source: New Indian Express)

Introduction

- Nearly a decade after the **Paris Agreement (2015)**, which aimed to limit global temperature rise to **1.5°C above pre-industrial levels**, the world is drifting away from this goal.
- A new analysis by the advocacy group **Oil Change International (OCI)**, titled

"Planet Wreckers: Global North Countries Fueling the Fire Since the Paris Agreement", exposes how major developed countries continue to expand fossil fuel production while neglecting their climate finance commitments.

mockery of justice and equity", highlighting that these nations are worsening global warming while the developing world bears its consequences.

Key Findings of the Report

- **Countries Identified:** Australia, Canada, Norway, and the United States.
- **Increase in Production:** These four nations collectively increased their **oil and gas production by 14 million barrels of oil equivalent per day (boe/d)** between 2015 and 2024 – a **40% rise** since the Paris Agreement.
 - **Contribution to Global Increase:**
 - The **United States** alone accounts for **over 90%** of the net global increase in oil and gas extraction during this period, with production up by **11 million boe/d**.
 - **Australia's** production rose by **77%**, the highest growth rate among the top 15 global producers.
 - Meanwhile, production in the **rest of the world** actually **fell by 2% cumulatively** over the same period.

Contradiction with Global Commitments

- At COP28 (Dubai, 2023), countries had agreed to **"transition away from the fossil fuel era" by 2030**.
- However, these four nations – often seen as champions of climate action – have continued expanding oil and gas extraction, contradicting both:
 - The **scientific consensus** on the need for rapid decarbonisation.
 - Their **moral and legal obligations** under the Paris Agreement.
- Romain Ioualalen, Global Policy Lead at OCI, termed this expansion a **"blatant**

The Climate Finance Deficit

Under the Paris Agreement, **developed nations (Global North)** are legally bound to provide **climate finance** to **developing countries (Global South)** to:

- Support their **transition to low-carbon economies**, and
- Help them **adapt to climate impacts** and manage **loss and damage**.
- However:
- Since 2015, the Global North has paid **only \$280 billion**, far below the required **\$1-5 trillion annually**.
- In contrast, they provided **\$465 billion** in **fossil fuel subsidies** for production and distribution infrastructure (pipelines, etc.).
- Oil and gas companies headquartered in the Global North earned profits **five times higher** than the total climate finance paid.
- **Six oil majors** – ExxonMobil, Chevron, Shell, TotalEnergies, BP, and Eni – made **over \$580 billion** in profits since 2015, **double the total climate finance provided**.
- This financial imbalance underscores a **double standard** – while the Global North demands emission cuts from developing nations, it continues subsidising and profiting from fossil fuels.

Environmental and Climatic Repercussions

- The relentless fossil fuel expansion by the Global North has **shrunk the global**

carbon budget – the maximum CO₂ that can be emitted while keeping warming below 1.5°C.

- **Current Status:**
- Scientists warn that at the **current rate of emissions**, the **1.5°C carbon budget** could be **exhausted within two years**.
- Breaching this threshold would trigger severe climatic disruptions.
- **Expected Consequences:**
- According to the **Intergovernmental Panel on Climate Change (IPCC)**:
 - Increase in **frequency and intensity of extreme weather events**, including floods and droughts.
 - **Warmer oceans**, leading to stronger and faster-forming hurricanes.
 - **More intense wildfires** and accelerated **polar ice melt**, contributing to **sea-level rise**.
- Many of these effects are already visible globally, from record-breaking heatwaves to catastrophic floods and wildfires.

Implications for the Global South

- Developing countries, already vulnerable to climate impacts, **require substantial financial and technological support** to transition to clean energy systems.
- Without adequate **climate finance**, the **loss and damage** from extreme events will further deepen inequality and developmental challenges.
- Failure of the Global North to meet financial and emission-cut commitments risks **breaching the 1.5°C target**, making adaptation costlier and more difficult.

The Equity Dimension

The crisis exposes the **inequity in global climate governance**:

- The **Global North**, which historically

contributed most to emissions, continues extracting and profiting from fossil fuels.

- The **Global South**, least responsible for emissions, faces the brunt of climate disasters with minimal support.
- This undermines the **principle of Common but Differentiated Responsibilities (CBDR)**, a foundational pillar of international climate agreements.

Way Forward

- **Phase-out Fossil Fuels:** Developed countries must **lead** the global transition by halting new oil and gas projects and setting timelines for a **complete phase-out**.
- **Fulfil Climate Finance Commitments:** Ensure **transparent, adequate, and predictable** financial transfers to developing nations – moving towards the **\$1–5 trillion annual requirement**.
- **Redirect Fossil Subsidies:** Redirect subsidies and tax breaks from fossil fuels to **renewable energy, green infrastructure, and climate resilience programs**.
- **Accountability Mechanisms:** Strengthen international mechanisms to **monitor and enforce** commitments under the Paris Agreement.
- **Support Just Transition:** Climate finance should also fund **just transition programs** for workers and communities dependent on fossil fuel industries.

Conclusion:

- The OCI report underscores a grim paradox: while nations of the Global South are urged to curb emissions, the **Global North continues to expand fossil fuel extraction and underfund climate commitments**.
- If this trend persists, the world risks

crossing the **1.5°C threshold**, leading to irreversible climate breakdowns. To restore faith in global climate justice, **wealthy nations must align their actions with their words**, honouring both **emission reduction** and **finance obligations** to ensure a sustainable and equitable future.

Kunming Biodiversity Fund: Supporting Nature-Friendly Agriculture in Developing Countries

Source: Down To Earth

UPSC Relevance: GS3 Environment and Ecology

Context: Kunming-Montreal Global Biodiversity Framework (KMGBF)

Why in News?

Seven countries — Cook Islands, Madagascar, Mexico, Nepal, Sri Lanka, Turkey, and Uganda — have received \$5.8 million from the Kunming Biodiversity Fund (KBF) to promote nature-friendly agriculture under the Kunming-Montreal Global Biodiversity Framework (KMGBF).



(Image Source: Down To Earth)

Introduction

- In a significant step toward integrating biodiversity conservation with food systems, **seven countries** — Cook Islands, Madagascar, Mexico, Nepal, Sri

Lanka, Turkey, and Uganda — have secured **\$5.8 million** in grants from the **Kunming Biodiversity Fund (KBF)**.

- Facilitated by the **Food and Agriculture Organization (FAO)**, this initiative seeks to promote **nature-positive agricultural practices**, community empowerment, and effective management of invasive species.
- This development aligns with the global commitments under the **Kunming-Montreal Global Biodiversity Framework (KMGBF)**, which aims to halt and reverse biodiversity loss by 2030 and restore ecological balance by 2050.

Background: The Kunming Biodiversity Fund (KBF)

- The **Kunming Biodiversity Fund** was established in **2021** by **China's Ministry of Ecology and Environment**, in collaboration with the **UN Environment Programme (UNEP)** and other partners.
- Initial Contribution:** 1.5 billion yuan (approximately **\$200 million**) pledged by China.
- Objective:** To support developing countries in implementing biodiversity-friendly projects and fulfilling the goals of the **KMGBF**.
- Launch Context:** The fund was announced during **Part I of the 15th Conference of the Parties (COP15)** to the **Convention on Biological Diversity (CBD)**.
- The fund reflects China's growing role in **global environmental governance**, emphasizing **South-South cooperation** and financial support for **developing nations** to meet biodiversity and sustainable agriculture goals.

The Kunming-Montreal Global Biodiversity Framework (KMGBF)

- Adopted in **2022** by 196 countries under the **CBD**, the **KMGBF** serves as a global roadmap to halt and reverse biodiversity loss.
- Key Goals (for 2050):**
 - Maintain and restore ecosystems** and halt species extinction.
 - Sustainably use biodiversity** for the benefit of people and nature.
 - Equitably share benefits** from genetic resources and associated data.
 - Mobilize financial and technical resources** for biodiversity protection.
- Targets for 2030:**
 - The framework sets **23 measurable targets**, including restoring degraded ecosystems, reducing the spread of invasive alien species, and promoting sustainable food systems.
 - A key financial target (**Target 19**) aims to **mobilize at least \$200 billion annually** from all sources by 2030, with **\$30 billion in international finance** directed to developing countries.
 - However, the **biodiversity finance gap** remains vast – estimated at around **\$700 billion per year**. Funds like the KBF are thus crucial to closing this gap.

New and Complementary Funding Mechanisms

- The Kunming Biodiversity Fund is part of a wider trend of **innovative biodiversity finance**.
- For instance, the **Cali Fund**, launched in **2025**, channels resources from companies using **digital sequencing information (DSI)** on genetic resources.

- At least **50% of its proceeds** are directed to **Indigenous Peoples and local communities**, recognizing their pivotal role in conserving biodiversity.
- This initiative also represents a major step toward **fair benefit-sharing** from the commercial use of genetic materials and associated data.

Focus Areas of the \$5.8 Million KBF Support

- The seven KBF-supported projects will focus on **mainstreaming biodiversity into agricultural systems, empowering local communities, and managing invasive alien species**.

1. Mainstreaming Biodiversity into Agrifood Systems

- (*Madagascar, Uganda, Mexico*)
- Aligning national biodiversity strategies and action plans with agricultural policies.
- Enhancing institutional capacity and policy frameworks.
- Promoting incentives for biodiversity-friendly farming.
- Facilitating knowledge exchange and farmer training on sustainable practices.

2. Empowering Communities

- (*Cook Islands*)
- Building ecosystem and biodiversity data systems.
- Promoting **agroecology** based on traditional and indigenous knowledge.
- Focusing on **women and youth participation** in sustainable farming initiatives.

3. Managing Invasive Alien Species

- (*Nepal*)
- Implementing community-based participatory methods to identify and eradicate invasive species.
- Protecting biodiversity and local

livelihoods threatened by invasive flora and fauna.

4. Preventing and Controlling Invasive Species

- (Sri Lanka)
- Strengthening border biosecurity measures.
- Training frontline teams in detection and management.
- Raising public awareness and mobilizing community engagement for early response.

5. Strengthening Ecosystem Resilience around Lake Eğirdir

- (Turkey)
- Promoting water-efficient and biodiversity-friendly agriculture.
- Encouraging sustainable livelihoods compatible with ecosystem conservation.
- Conducting awareness campaigns for ecosystem and biodiversity protection.

FAO's Role and Perspective

- The FAO, which played a central role in mobilizing and implementing these projects, views the initiative as a model of **integrated action** linking food security, biodiversity conservation, and climate resilience.
- FAO Director-General **QU Dongyu** emphasized that the funding will:
 - Help developing countries **achieve biodiversity goals** through sustainable agriculture.
 - Strengthen **food diversity** and **ecosystem resilience**.
 -

Support **climate change mitigation** by promoting nature-based solutions.

Significance for Global Environmental Governance

- The KBF initiative underscores a broader shift in **global environmental policy** – from isolated conservation efforts to **holistic, cross-sectoral approaches** that integrate **agriculture, biodiversity, and community well-being**.
- It also strengthens the **implementation of KMGBF targets** by:
 - Addressing the **biodiversity finance deficit**,
 - Promoting **South-South cooperation**, and
 - Building **institutional and community capacity** in developing countries.

Conclusion:

- The \$5.8 million allocation under the **Kunming Biodiversity Fund** is a small but symbolically powerful step toward **mainstreaming biodiversity in agriculture**.
- It reflects the growing global consensus that **food systems and ecological systems are interdependent**, and sustainable agriculture must lie at the heart of biodiversity protection.



SOCIAL JUSTICE

Indian Knowledge Systems Need to be Inclusive to Live up to the Constitution's Spirit

Source: New Indian Express

UPSC Relevance: GS1 Social Justice

Context: Indian Knowledge Systems

Why in News?

UGC's draft curriculum on Indian Knowledge Systems has sparked debate for prioritising Vedic traditions, risking marginalisation of non-Hindu and tribal knowledge and undermining scientific temper envisaged by the Constitution.



(image Source: New Indian Express)

Introduction

- The recent **draft Learning Outcome-based Curriculum Framework (LOCF)** released by the **University Grants Commission (UGC)** has reignited discussions around the integration of **Indian Knowledge Systems (IKS)** in higher education.
- The framework proposes embedding '*Bharatiya philosophy*' across disciplines – from including **Kautilya's Arthashastra in commerce** to integrating ancient

conceptions of *paramanu* (atom) in chemistry.

- While this move seeks to '**decolonise**' and '**indigenise**' education in line with the National Education Policy (NEP) 2020's emphasis on IKS, it is drawing **scholarly criticism**. Critics argue that the framework:
 - Undermines the **multidisciplinary and holistic vision** of NEP by prioritising **single-major pathways**.
 - Risks **diluting scientific enquiry** by privileging certain traditions as universally valid.
 - **Marginalises non-Hindu, tribal, and other heterodox traditions** central to India's plural knowledge heritage.

Historical Context: Colonial Legacy and Hindu Exceptionalism

- The **roots of IKS as Hindu exceptionalism** trace back nearly two centuries. Scholars like **Meera Nanda** note that Hinduism came to be portrayed as a "*religion of science*" during colonial times, with the **Vedic tradition exalted for its "non-dogmatic rationalism"** and "*supersensory empiricism*."
- Figures such as **Swami Vivekananda**, notably in his 1893 Chicago address, linked **modern science to Hindu tradition**, portraying it as a natural ally rather than an external construct. This narrative gained momentum during British rule as part of the **tussle between rationalism and nationalism, reform and revival**.
- However, post-Independence, this approach led to the **Sanskritisation of**

science, aiming to validate Hindu epistemic claims rather than fostering a **citizen-centric, pluralistic scientific culture** envisioned in the Constitution. This shift sidelined critical traditions like **Charvaka materialism, Buddhist rationalism, Jain logic, and contributions of Islamic scholars**, thus restricting the diverse philosophical underpinnings of Indian civilisation.

Constitutional Vision vs. Monolithic Narratives

- The **Constitution of India**, though not explicitly codifying science in its fundamental rights, upholds **scientific enquiry as a normative democratic ideal**—reflected in **Article 51A(h)**, which obligates citizens to *“develop the scientific temper, humanism, and the spirit of enquiry and reform.”*
- Leaders like **Jawaharlal Nehru** viewed science as a tool for **nation-building and civic empowerment**, envisioning it as a **vehicle for reform, dialogue, and dissent**. However, this vision faltered due to political inertia and the failure to create enabling social conditions.
- The UGC’s current approach, while claiming to decolonise education, risks **substituting colonial hierarchies with new ideological ones**. By **universalising upper-caste Vedic-Sanskritic traditions**, it sidelines India’s **heterogeneous epistemic traditions** and potentially undermines **constitutional commitments to inclusivity and scientific temper**.

Need for Inclusivity: Tribal and Indigenous Pedagogies

- A critical shortcoming of the proposed framework is its **limited engagement with indigenous and tribal knowledge**

systems. True decolonisation requires embracing **living traditions and plural pedagogies**—from **tribal ecological wisdom and oral traditions** to **regional linguistic philosophies**—rather than projecting a **static, selective image of ancient India**.

- Failure to integrate these diverse epistemologies risks **replacing one form of intellectual hegemony with another**, thereby alienating marginalised communities and reinforcing cultural homogenisation.

Tension with NEP’s Multidisciplinary Ethos

- The **NEP 2020** advocates a **multidisciplinary and holistic approach** to higher education, allowing students to explore subjects beyond narrow specialisations. However, the LOCF’s focus on **discipline-specific credits** limits this flexibility, thereby **contradicting NEP’s vision**.
- Moreover, by embedding IKS in a prescriptive manner—without open academic debate—the framework risks **stifling critical thinking** and fostering **rote adherence to a singular historical narrative**.

Way Forward: Democratic Engagement and Plural Knowledge

To uphold the **spirit of the Constitution** and realise the promise of **inclusive decolonisation**, the following steps are imperative:

- **Pluralising IKS**: Integrate **Buddhist, Jain, Charvaka, Sufi, and tribal traditions** alongside Vedic thought.
- **Safeguarding Scientific Temper**: Ensure that **science and philosophy remain in the crucible of open debate, dissent, and scrutiny**, avoiding dogma.
- **Aligning** with **NEP’s**

Multidisciplinary: Provide flexibility for **cross-disciplinary exploration** while incorporating IKS.

- **Strengthening Civic Participation:** Engage scholars, educators, and communities—especially **tribal groups and minorities**—in curriculum development.
- **Contextualising Heritage:** Present ancient contributions historically and critically, highlighting their **limitations and evolution** over time.

Conclusion:

- India's quest to **decolonise education** must not devolve into **ideological indoctrination**. The true essence of IKS lies in celebrating **pluralism, critical enquiry, and living traditions**—values aligned with both the NEP 2020 and the Constitution's directive for scientific temper and humanism.

NCRB Report 2023 and issue of Rise in Suicides

Source: Down To Earth

UPSC Relevance: GS 1 Social Justice

Context: NCRB Report 2023

Why in News?

The NCRB 2023 report shows a rise in suicides due to illnesses, sudden deaths from heart attacks, and abortion-related fatalities, highlighting emerging public health and mental health concerns in India.

Introduction

- The **National Crime Records Bureau (NCRB) Report 2023** has highlighted worrying trends in public health-related deaths in India.
- The data shows a **3.2% rise in suicides**

due to illnesses, a 10% increase in sudden deaths from heart attacks, and a 59% spike in abortion-related fatalities, underlining the need for integrated health, mental-wellbeing, and maternal care interventions.



(Image Source: Down To Earth)

Suicides Linked to Illnesses:

- Suicides due to illnesses accounted for **19% of all suicides in 2023**, making it the **second leading cause after family problems (32%)**. The number increased from **31,484 in 2022 to 32,503 in 2023**.
- The most affected age group was **30-45 years (8,964 deaths)**, followed by **45-60 years (7,938)** and **18-30 years (7,386)**.
- **Men were disproportionately affected**, with **22,987 deaths**, compared to **9,501 among women and 15 among transgender individuals**.
- Mental illnesses remained a leading factor, causing **13,978 suicides**, though showing a **4% decline from 2022**. Conversely, **cancer-related suicides rose by 14% (1,251 in 2022 to 1,427 in 2023)**, and suicides due to **"Other Prolonged Illness"** increased by **11%**.
- **Regional concentration:** Tamil Nadu reported the highest share (**21%**) of suicides due to illness, followed by **Maharashtra (12%)** and **Karnataka (10%)**.
- A **2024 longitudinal study (1995-2021)** cited by NCRB shows that suicides

linked to illness have surged over time. Among males, the share rose from **19% (2011–2015) to 45% (2016–2021)**, highlighting the growing health burden on mental resilience.

Sudden Deaths: Escalation in Heart-Attack-Related Fatalities

- The report also flagged a surge in **“sudden deaths”** – defined as **unexpected deaths occurring instantaneously or within minutes due to causes other than violence**.
 - Sudden deaths increased by **13%**, from **56,450 in 2022 to 63,643 in 2023**.
 - **Heart attacks** contributed to a large share, rising **10%** from **32,457 in 2022 to 35,715 in 2023**.
 - Deaths due to **other sudden causes** (such as brain haemorrhage) increased **16.4%**, from **23,993 in 2022 to 27,928 in 2023**.
- Age-wise data indicates that **people aged 45-60 years were most affected (34% of sudden deaths)**, followed by the **30-45 years group (31%)**.
- Among heart-attack deaths specifically, **38% occurred in the 45-60 years group**, highlighting the burden of lifestyle-related non-communicable diseases.
- In contrast, **younger groups (0-18 years)** accounted for relatively few heart-attack deaths; however, **92% of sudden deaths in children (0-14 years) and 80% among adolescents (14-18 years)** were caused by factors **other than heart attack**, pointing towards different health risks in younger populations.

Maternal Mortality and Abortion-Linked Deaths:

- The NCRB data also raises alarms on **maternal deaths during pregnancy**, which rose by **5.4%**, from **1,073 deaths in**

2022 to 1,131 in 2023.

- Particularly striking was the **59% surge in abortion-related deaths**, from **80 in 2022 to 127 in 2023**. Unsafe abortions remain a critical public health concern despite the legal framework provided by the **Medical Termination of Pregnancy (MTP) Act**.
- A **2019 study** underscores this challenge, reporting that out of **89,447 abortions among 1.87 million pregnant women (2007–2011)**, **65% (58,266)** were classified as **unsafe**, often associated with **rural residence, Scheduled Tribe groups, and younger maternal age (15–19 years)**.
- The same study linked **253 maternal deaths** to unsafe abortion practices, reflecting systemic gaps in access to safe reproductive healthcare.

Interlinkages

- The rising **suicides due to illnesses, sudden cardiac deaths, and abortion-linked fatalities** reveal a common thread of **inadequate healthcare access, insufficient mental-health support, and persisting inequities in rural and vulnerable groups**.
- **Chronic diseases and prolonged illnesses** not only cause physical suffering but also drive mental distress leading to suicides.
- **Cardiovascular mortality** highlights the urgent need for preventive healthcare strategies focusing on hypertension, diabetes, and stress-related disorders.
- **Abortion-related fatalities** point to **gaps in safe maternal healthcare services** despite existing legislation.
- The data collectively underscores the **interdependence of physical health, mental wellbeing, and social determinants** such as **poverty, gender, and rural access to care**.

Way Forward

- **Mental Health Integration:** Expand mental-health services at primary healthcare levels under the **National Mental Health Programme**.
- **Chronic Disease Management:** Strengthen early screening and treatment of non-communicable diseases under **Ayushman Bharat - Health and Wellness Centres**.
- **Cardiac Health Awareness:** Promote lifestyle interventions and emergency response infrastructure for heart-attack cases.
- **Safe Maternal & Abortion Care:** Improve access to safe abortion facilities and skilled medical personnel, especially in rural and tribal areas.
- **Data-Driven Interventions:** Utilize NCRB data to identify high-risk regions and vulnerable populations for targeted interventions.

Conclusion:

- The **NCRB Report 2023** serves as a crucial reminder that **public health challenges extend beyond hospitals to socio-economic, mental, and gendered dimensions**.

Draft Labour Policy Proposes Integration of All Social Security Schemes

Source: The Hindu

UPSC Relevance: GS2 Social Justice

Context: Draft National Labour and Employment Policy 2025

Why in News?

THE DRAFT SHRAM SHAKTI NITI 2025 AIMS TO CREATE UNIVERSAL, PORTABLE SOCIAL SECURITY

ACCOUNTS, ENHANCE WOMEN'S LABOUR PARTICIPATION, AND MODERNISE INDIA'S WORKFORCE THROUGH DIGITAL COMPLIANCE AND SKILL INTEGRATION.

Introduction

- The Union Labour Ministry released the draft **National Labour and Employment Policy (Shram Shakti Niti 2025)** for public consultation.
- The policy is a landmark initiative aiming to unify India's fragmented social security landscape, enhance workforce participation, and create a future-ready labour ecosystem aligned with India's vision of a developed nation by 2047.

Key Features of the Draft Policy

- **Universal and Portable Social Security**
A cornerstone of the policy is the creation of **universal, portable social security accounts** for all workers. By integrating schemes such as:
 - Employees Provident Fund Organisation (EPFO)
 - Employees State Insurance Corporation (ESIC)
 - Pradhan Mantri Jan Arogya Yojana (PMJAY)
 - e-SHRAM
 - State welfare boards
- The policy seeks to ensure that a worker's social security benefits are **comprehensive, seamless, and transferable across sectors and states**, reducing informality and promoting long-term welfare.
- **Women's Labour Participation** The draft policy aims to **raise female labour-force participation to 35% by 2030**, addressing historical gender disparities. Measures include gender-sensitive standards in occupational safety, targeted skilling programs, and career

guidance initiatives.

- **Single-Window Digital Compliance for MSMEs** Recognising the crucial role of Micro, Small and Medium Enterprises (MSMEs), the policy proposes **digital self-certification and simplified compliance**, promoting formalisation while reducing bureaucratic burdens.
- **Occupational Safety and Skills Integration** Implementation of the Occupational Safety and Health Code with **risk-based inspections** and AI-enabled safety systems is proposed. Convergence of skill development schemes aims to create a **future-ready workforce**, equipped for emerging sectors, including green jobs.
- **Green and Decent Jobs** In line with sustainable development goals, the policy promotes **green jobs**, emphasizing environmental responsibility alongside economic growth.

Expected Outcomes

The draft policy envisages transformative outcomes for India's workforce:

- **Universal worker registration and social security portability**
- **Near-zero workplace fatalities**
- **Reduction in informal employment** via digital compliance
- **AI-driven labour governance** across states
- **Creation of millions of green and decent jobs**
- **A unified 'One Nation Integrated Workforce' ecosystem** enabling inter-ministerial coherence and transparent monitoring



(Image Source: The Hindu)

Implementation Phases

The policy proposes a **three-phase rollout**:

- **Phase I (2025-27):** Institutional setup, social security integration, and pilot initiatives.
- **Phase II (2027-30):** Nationwide rollout of universal social security accounts, skill-credit systems, and district-level Employment Facilitation Cells.
- **Phase III (Beyond 2030):** Paperless governance, predictive analytics, continuous policy review, and refinement based on real-time data.
- **Monitoring and Accountability:** Progress will be tracked through:
- **Labour & Employment Policy Evaluation Index (LPEI)** benchmarking states
- **Annual National Labour Report to Parliament**
- **Independent third-party reviews** for transparency

Implications for India

- **Economic Formalisation:** By integrating social security and promoting digital compliance, the policy encourages formalisation, potentially increasing tax revenues, and enabling better labour market regulation.
- **Gender Inclusion:** Raising female workforce participation addresses gender inequities, boosts household

incomes, and supports broader economic growth.

- **Youth Employment and Skill Development:** Integration of skill schemes and career guidance programs can enhance employability in emerging sectors, particularly in technology-driven and green industries.
- **Governance and Technology Integration:** AI-driven inspections and predictive analytics can improve regulatory efficiency, reduce workplace hazards, and modernise labour governance.
- **Sustainability and Just Transition:** Emphasis on green jobs ensures alignment with climate goals, while “just-transition pathways” safeguard workers from displacement due to industrial shifts.

Challenges Ahead

- **Digital Divide:** Successful implementation depends on digital literacy and infrastructure, particularly in rural areas.
- **Inter-Ministerial Coordination:** Integrating multiple social security schemes requires robust cooperation across ministries and states.
- **Compliance Enforcement:** Ensuring adherence by informal sector workers and small enterprises will remain a challenge.
- **Gender Barriers:** Social and cultural barriers may limit women’s participation, despite policy provisions.

Conclusion:

- The **Shram Shakti Niti 2025** represents a **comprehensive vision for India’s labour market**, combining social security, safety, skills, and technology.

The Need to Address Caste-Based Atrocities

Source: The Hindu

UPSC Relevance: GS2 Social Justice

Context: Caste-Based Atrocities

Why in News?

Despite constitutional safeguards, caste-based atrocities against Scheduled Castes (SCs) and Scheduled Tribes (STs) persist in India, highlighting gaps in law enforcement, social reform, and political will.



(Image Source: The Hindu)

Introduction

- Despite over seven decades of constitutional democracy, caste continues to remain a major fault line in Indian society. The *National Crime Records Bureau (NCRB) 2023 report* revealed alarming statistics:
 - **57,789 cases** of atrocities were registered against *Scheduled Castes (SCs)* – a **0.4% rise** from 2022.
 - **12,960 cases** of atrocities were registered against *Scheduled Tribes (STs)* – a **28.8% increase** from 2022.
- These figures expose the persistence of caste-based violence and exclusion – from physical assaults in rural areas to subtle but systemic discrimination in urban spaces such as housing, employment, and education.

Caste Hierarchies: A Persistent Social Reality

- Despite India's constitutional vision of equality (Articles 14-17), caste hierarchies continue to shape social relations. Reformers such as **Mahatma Phule, B.R. Ambedkar, Periyar, and Mahatma Gandhi** led movements to dismantle Brahmanical dominance.
- The **Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act, 1989** (PoA Act) was a landmark legislative safeguard designed to deter caste violence.
- However, the persistence of acts such as public humiliation, social boycott, or physical violence against Dalits and Adivasis reflects that *legal reform has not translated into moral reform*. The social belief in caste-based superiority remains internalised, and violence often serves as a means to reinforce social hierarchies.
- Sociologically, this aligns with **Louis Dumont's** notion of "*hierarchy and purity-pollution*" – where caste is not merely an occupational division but a moral order that legitimises inequality.

State Response and Political Limitations

- While Dalits and Adivasis are occasionally included in cultural or religious events, these acts often lack substantive policy backing.
- The *Hindutva* discourse, the author argues, tends to portray demands for caste justice as divisive or "Hinduphobic." This delegitimises the struggles of marginalised communities and limits the space for their political articulation.
- Furthermore, **implementation gaps** in social justice policies, especially in

reservation benefits, reflect a lack of political will. Dominant castes continue to occupy key administrative, academic, and economic positions, perpetuating structural inequality.

Erosion of Anti-Caste Movements and Civil Society Response

- Historically, movements such as the **Dalit Panthers (1970s)** and the **Bahujan Samaj Party (BSP)** redefined the discourse on caste, demanding dignity, power, and representation for Bahujans (SCs, STs, and OBCs). They represented a counter-hegemonic force to upper-caste dominance in politics and culture.
- Today, however, such movements are fragmented.
- Dalit-Bahujan cultural assertions – through literature, cinema, and art – are marginalised or censored (e.g., the controversy surrounding the film *Phule*).
- Civil society, media, and academia show declining engagement with caste issues, shifting focus to broader populist or nationalist themes.
- This decline of organised anti-caste resistance has weakened collective bargaining for equality and allowed the persistence of everyday discrimination.

Institutional and Legal Shortcomings

- The existence of progressive laws like the **PoA Act, 1989** is undermined by weak enforcement.
- According to a **2023 study by the National Campaign on Dalit Human Rights**, over **60% of cases under the Act remain pending in courts**.
- Conviction rates are low, and victims often face threats, social ostracism, or lack of legal aid.
- Police bias and delayed investigations further dilute justice delivery.

- This points to what sociologist **Gunnar Myrdal** termed the “*soft state syndrome*” – where social norms overpower formal institutions, making rule of law ineffective against entrenched power structures.

The Way Forward: A Multi-Pronged Approach

- To address caste-based atrocities effectively, a **multi-layered strategy** is essential – combining **legal, political, educational, and cultural** interventions.

1. Strengthening Law Enforcement

- Ensure **speedy investigation** and **special courts** for atrocity cases.
- Mandate **police sensitisation** and **community monitoring mechanisms**.
- Introduce **victim compensation and rehabilitation** schemes with transparency.

2. Political and Educational Reforms

- Launch a **national campaign** promoting inter-caste fraternity, drawing on the spirit of Article 51A(e) (the duty to renounce practices derogatory to women or any section of society).
- Integrate anti-caste education into school curricula and teacher training programmes.
- Encourage political parties to ensure **diverse representation** in leadership.

3. Revitalising Civil Society and Media

- Religious, cultural, and academic institutions must foster inter-community dialogue and highlight caste injustices.
- Media and cinema should be leveraged to **normalize narratives of equality**, not stereotypes.
- Strengthen Dalit-Bahujan cultural platforms and protect artistic freedom.

4. Effective Affirmative Action

- Implement **reservation policies**

rigorously in education, employment, and promotions.

- Ensure **data transparency** and periodic audits of reservation compliance.
- Focus on **economic empowerment** through targeted schemes for entrepreneurship and land redistribution.

5. Reinvigorating Social Movements

- Rebuilding coalitions among SC, ST, OBC, and minority groups can renew the **Bahujan solidarity** of the past.
- Encourage **grassroots leadership** and **collective mobilisation** around dignity, equality, and justice.

Conclusion:

- India’s constitutional democracy rests on the ideals of **justice, liberty, equality, and fraternity**. Yet, the continued prevalence of caste atrocities challenges this moral foundation.
- The struggle against caste cannot be left to legislation alone; it demands **ethical, cultural, and political transformation**.

Number of Births Declines; Deaths Rise Slightly: CRS Report 2023

Source: The Hindu

UPSC Relevance: GS2 Social Justice

Context: Births rate Decline

Why in News?

The Vital Statistics of India based on Civil Registration System (CRS) Report 2023 highlights a decline in births, a slight rise in deaths, and near-universal birth registration across India.

Background

- The “*Vital Statistics of India based on Civil*”

Registration System (CRS) Report 2023", released by the **Registrar General of India (RGI)** on **October 13, 2025**, provides key insights into the demographic trends of the country.

- The report reveals a **decline in the number of births** and a **marginal rise in deaths** compared to the previous year, highlighting India's gradual demographic transition.

Birth Statistics: Decline in Total Births

- Total Births in 2023:** 2.52 crore
- Decline from 2022:** 2.32 lakh fewer births
- This marks a small but significant decline in the birth rate, suggesting ongoing demographic changes such as urbanization, rising education levels, delayed marriages, and increased access to family planning.
- Registration Coverage**
 - Overall Birth Registration:** 98.4% (nationwide)
 - Institutional Births:** 74.7% of total registered births
- Note:* Data from Sikkim was not included in the report.
- The near-universal coverage of birth registration reflects a substantial improvement in the functioning of the **Civil Registration System (CRS)** across the country.

2. Death Statistics: Marginal Increase

- Total Deaths in 2023:** 86.6 lakh
 - Deaths in 2022:** 86.5 lakh
 - Deaths in 2021:** 102.2 lakh (a spike during the pandemic's second wave)
 - Deaths in 2020:** 81.2 lakh
- The slight increase in deaths from 2022 to 2023 contrasts sharply with the **21 lakh excess deaths recorded in 2021**, a year severely affected by the second wave of COVID-19.
- Despite over **5.33 lakh** officially

recorded COVID-19 deaths (as per the Ministry of Health dashboard till May 2025), the CRS data indicates that **mortality levels have since stabilized**, suggesting a return to pre-pandemic patterns.



(Image Source: The Hindu)

Sex Ratio at Birth: Persistent Regional Imbalances

- The **sex ratio at birth (SRB)** – the number of female births per 1,000 male births – continues to reflect deep-rooted gender disparities in several states.
- Lowest SRB States (2023):**

State	Sex Ratio at Birth
Jharkhand	899
Bihar	900
Telangana	906
Maharashtra	909
Gujarat	910
Haryana	911
Mizoram	911

- Bihar** has consistently recorded the **lowest sex ratio since 2020**, pointing to continued gender bias in prenatal and postnatal care.
- Highest SRB States (2023):**

State / UT	Sex Ratio at Birth
Arunachal Pradesh	1,085
Nagaland	1,007

Goa	973
Ladakh	972
Tripura	972
Kerala	967

- The wide variation in SRB underscores **regional socio-cultural differences** and the **need for targeted interventions** to promote gender equity.

Timeliness and Quality of Registration

- The CRS report also highlights significant improvements in the **timeliness of registration** within the legal window of 21 days.
- States/UTs with Over 90% Timely Registration:**
 - Gujarat, Puducherry, Chandigarh, Dadra & Nagar Haveli and Daman & Diu
 - Tamil Nadu, Lakshadweep, Andaman & Nicobar Islands
 - Haryana, Himachal Pradesh, Goa, Punjab
- States with 80–90% Timely Registration:**
 - Odisha, Mizoram, Maharashtra, Chhattisgarh, Andhra Pradesh
- States with 50–80% Timely Registration:**
 - Assam, Delhi, Madhya Pradesh, Tripura, Telangana, Kerala, Karnataka, Bihar, Rajasthan, J&K, Jharkhand, West Bengal, Meghalaya, Uttar Pradesh
 - This classification shows that while overall registration is high, **timely registration remains uneven**, particularly in larger and less developed states such as **Bihar, Uttar Pradesh, and Jharkhand**.

Significance of the CRS and Policy Implications

- The **Civil Registration System (CRS)** serves as the **foundation for India's demographic statistics**, enabling accurate estimation of population trends and vital rates like birth rate, death rate, and infant mortality rate.

Policy Implications:

- The decline in births points toward **demographic stabilization**, aligning with India's projected trajectory toward **population plateauing** by the mid-21st century.
- The improved registration rates highlight the **strengthening of administrative systems and digital governance frameworks**.
- Persistent gender imbalances in SRB emphasize the need for **social awareness campaigns** and stricter enforcement of the **Pre-Conception and Pre-Natal Diagnostic Techniques (PCPNDT) Act**.

Need for a Law to Protect Domestic Workers

Source: The Hindu

UPSC Relevance: GS2 Social Justice

Context: Protect Domestic Workers

Why in News?

The Supreme Court has directed the Union government to enact a comprehensive law protecting domestic workers, highlighting their vulnerability and lack of social security.

Introduction

- The Domestic workers form an essential yet invisible segment of India's workforce. Despite contributing significantly to household economies and urban functioning, they remain among the most underprotected and undervalued workers.

- The absence of a comprehensive **national legislation** for domestic workers has resulted in systemic exploitation, low wages, and lack of social security.
- The recent **Supreme Court directive (January 2025)** calling for a national law to ensure their rights has revived the debate on institutional protections for this vulnerable group.



(Image Source: The Hindu)

Background and Judicial Context

- In **January 2025**, the Supreme Court directed the **Union government** to frame a comprehensive law safeguarding domestic workers' rights.
- The directive emerged from a case involving **trafficking and confinement** of a Scheduled Tribe (ST) woman from Chhattisgarh working as a domestic help in Delhi – a stark reminder of the precarity in this sector.
- The Court also ordered the formation of a **committee of subject experts** to devise a legislative framework within six months. However, the progress and inclusivity of this process, particularly the absence of worker representation, remain uncertain.

The Scale and Nature of Domestic Work in India

- Estimates suggest India has between **4 million and 90 million domestic workers**, with women and girls

constituting the overwhelming majority. A large proportion belong to **Scheduled Castes and Scheduled Tribes**, reflecting a deep intersection of **gender, class, and caste-based vulnerabilities**.

- Domestic work in India takes multiple forms:
 - **Live-in workers** employed full-time in one household.
 - **Part-time workers** serving several households daily.
 - **Migrant domestic workers**, often crossing state or even national borders.
- This informal, home-based, and fragmented nature of work makes **labour inspections, enforcement of minimum wages, and regulation of working hours** extremely challenging.

Current Legal and Institutional Gaps

- Despite repeated attempts, India **lacks a standalone central law** to protect domestic workers.
- The **Domestic Workers (Regulation of Work and Social Security) Bill, 2017**, drafted by the **National Platform for Domestic Workers (NPDW)**, was never enacted.
- India voted in favour of the **ILO Convention No. 189 (2011)** on decent work for domestic workers but has **not ratified** it.
- Domestic workers are largely excluded from the **Industrial Disputes Act, Minimum Wages Act (in most states), and social security laws**.
- This absence of legislative backing denies workers access to basic entitlements like fixed wages, maternity benefits, pensions, and legal recourse against exploitation.

State-Level Efforts and Progress

- Despite national inaction, some states have taken pioneering steps:

a) Tamil Nadu

- Tamil Nadu established a **Welfare Board for Domestic Workers** under the **Manual Workers Act, 1982**.
- Registered workers are eligible for **pensions, maternity benefits, accident relief, and educational assistance** for children.
- However, **low registration rates** and **wage disparities** persist — despite a stipulated wage of ₹37-₹39 per hour, most workers earn less due to being labelled “part-time”.
- The **Madras High Court (Madurai Bench)** has directed the State to consider enacting **special legislation** exclusively for domestic workers.

b) Karnataka

- In 2025, Karnataka introduced the **Domestic Workers (Social Security and Welfare) Bill**, proposing:
 - **Mandatory registration** of workers and employers.
 - **Written employment contracts** specifying wages and work hours.
 - **Minimum wage, overtime pay, and weekly holidays**.
 - **5% employer contribution** to a welfare fund for social security benefits.
- This model represents a **progressive template** for national-level replication.

Key Challenges in Protecting Domestic Workers

- **Invisibility of workplace:** Since work occurs in private homes, labour inspections are nearly impossible.
- **Fragmented employment:** Workers often serve multiple employers, complicating wage regulation.

- **Exploitation by agents:** Unregulated recruitment intermediaries promote trafficking and bonded labour.
- **Gender-based vulnerability:** Most workers are women, often subjected to **sexual harassment and abuse**.
- **Migrant insecurity:** Many domestic workers migrate across states without formal documentation, lacking access to local welfare schemes.
- **Social stigma:** Domestic work is undervalued, linked to caste hierarchies and notions of servitude.

What Needs to Be Done

- A **comprehensive, rights-based framework** is urgently needed to integrate domestic workers into the formal labour system. Key policy imperatives include:

(a) Central Legislation

- Enact a **Domestic Workers (Regulation of Work and Social Security) Act** ensuring:
- Minimum wages, fixed work hours, and weekly rest.
- Written contracts and transparent recruitment processes.
- Protection against abuse and sexual harassment.
- Universal registration of workers, agencies, and employers.

(b) Institutional Mechanisms

- Establish a **Tripartite Board** comprising employers, employees, and state representatives.
- Issue **workbooks** for documentation of employment terms and wage payments.
- Create **Grievance Redressal Committees** at **panchayat and urban local body levels**, extending the **POSH Act** framework to domestic workplaces.

(c) Social Security and Welfare

- Introduce **portable welfare schemes** for migrant workers.
- Mandate **employer contributions** to welfare funds, as proposed in Karnataka.
- Provide **health insurance, maternity benefits, pensions, and housing support**.
- **(d) Ratification of ILO Convention No. 189**
- India should ratify and domestically implement this international convention, reaffirming its commitment to decent work and gender justice.

The Way Forward

- Domestic workers form the backbone of urban care economies, enabling millions of others — especially women — to participate in the labour market. Yet, their rights continue to be subordinated to the privacy of households and patriarchal norms.
- The path forward demands that India:
 - Recognize **domestic work as legitimate labour**,
 - Extend **labour rights into private households**, and
 - Build **institutional accountability** at national and state levels.
- The Supreme Court's intervention offers an opportunity to **transform judicial direction into legislative action**. What remains is political will and social recognition of these workers as equal citizens in the world of work.

Conclusion:

- Domestic workers deserve not charity but justice. A national law safeguarding their rights would mark a crucial step toward gender equity, social dignity, and inclusive labour governance.

Building a Shikshit Bharat:

Education and Skills for India's Future

Source: New Indian Express

UPSC Relevance: GS 2 Social Justice

Context: Shikshit Bharat and Skill development

Why in News?

"A Shikshit Bharat for the Future" stresses that India must prioritise education, skill development, and technology-led growth to achieve sustainable progress and global competitiveness.

Introduction

- The vision of a developed India, or *Viksit Bharat*, cannot be achieved without a strong foundation of education, skills, and innovation.
- In the rapidly evolving global landscape shaped by artificial intelligence (AI), advanced technologies, and knowledge-based industries, the creation of a *Shikshit Bharat*—an educated and skilled India—is essential for national progress.
- Economic power, technological capability, and human capital are becoming the principal determinants of a nation's global standing.



(Image Source: new Indian Express)

The Changing Global Economic Order

- The 21st century is defined by the rise of

nations that have successfully leveraged education, technology, and innovation to transform their economies. Countries such as China, South Korea, and the United Arab Emirates have demonstrated how strategic investment in human resources and technology can rapidly elevate national status.

- China's transformation from an agrarian economy in the 1980s to a global manufacturing and technological power highlights the role of education and research in national development. Similarly, the UAE's diversification beyond oil demonstrates how policy reforms, skill development, and global integration can drive progress even in resource-scarce environments.
- For India, which aspires to become one of the world's leading economies, replicating such growth trajectories requires focusing on the quality of education, innovation ecosystems, and technological capability.

India's Current Challenges

- India's demographic advantage—over 60 percent of its population being below the age of 35—can become a liability if not adequately educated and skilled. Several interrelated challenges hinder India's progress toward becoming a knowledge-driven society.

1. Skill and Education Deficit

- Despite near-universal primary enrollment, the quality of education remains a concern. According to the Annual Status of Education Report (ASER), foundational literacy and numeracy among schoolchildren are inadequate. Higher education institutions face issues of employability, outdated curricula, and limited industry linkage.

2. Technological Backwardness

- In the global race for leadership in AI, machine learning, and advanced manufacturing, India lags behind. The country remains dependent on imports for crucial technologies, components, and raw materials—particularly from China. This dependence weakens strategic autonomy and industrial competitiveness.

3. Limited Research and Innovation Capacity

- India's expenditure on research and development (R&D) has stagnated at around 0.6–0.7 percent of GDP, compared to over 2 percent in China and nearly 3 percent in advanced economies. The absence of strong university-industry collaboration limits innovation and commercialization potential.

4. Inequality and Divisive Politics

- Socio-political polarization and uneven access to quality education have deepened inequalities. Regional disparities and inadequate governance in education reinforce the cycle of exclusion, preventing the creation of a unified, skilled workforce.

The Role of Education and Technology in National Development

A "Shikshit Bharat" represents more than literacy; it involves empowering citizens with critical thinking, creativity, and digital skills. Education is both a moral and economic imperative for modern India.

1. Education as an Engine of Growth

- Investing in education generates a multiplier effect—improving productivity, social mobility, and innovation. Countries that expanded access to quality higher education have achieved sustained growth through innovation-led industries.

2. Skilling for the AI Age

- The global economy is transitioning toward automation and artificial intelligence. India must reform its education and training systems to prepare youth for emerging sectors such as robotics, green technology, biotechnology, and data science.

3. Integration of Policy and Industry

- Educational reform must be integrated with industrial and digital policies. Initiatives like the National Education Policy (NEP) 2020, Skill India, and Digital India are steps in the right direction but require effective implementation and coordination.

Policy Recommendations

- **Prioritize Foundational Learning:** Strengthen early childhood and school education through investment in teacher training, digital tools, and learning assessment reforms.
- **Expand Vocational and Technical Training:** Align skill development programs with industry demand, emphasizing apprenticeships and public-private partnerships.
-

Enhance R&D and Higher Education:

Increase R&D expenditure to at least 1.5 percent of GDP; promote innovation clusters around universities.

- **Encourage Global Collaboration:** Negotiate and deepen free trade agreements in technology and education to enhance knowledge exchange.
- **Promote Equity and Inclusion:** Ensure that women, rural populations, and marginalized groups have equal access to quality education and skill training.
- **Build a Governance Framework for AI:** Develop a national AI strategy that balances innovation with ethical safeguards and employment transitions.

Conclusion:

- The pursuit of *Viksit Bharat* by 2047 is unattainable without first achieving a *Shikshit Bharat*.
- An educated and skilled citizenry is the foundation of a resilient economy, a vibrant democracy, and a secure nation. India must shift its policy priorities from short-term political objectives to long-term investments in human capital, technology, and governance.



SCIENCE & TECHNOLOGY

Anusandhan National Research Foundation's SARAL Tool: Making Science Accessible

Source: The Hindu

UPSC Relevance: GS3 Science and Technology

Context: Anusandhan National Research Foundation (ANRF)

Why in News?

The Anusandhan National Research Foundation (ANRF) launched the AI-powered SARAL tool to generate layperson-friendly summaries of complex scientific research to make science more accessible.



(Image Source: The Hindu)

Introduction

- The **Anusandhan National Research Foundation (ANRF)**, India's newest science funding agency, has launched an innovative tool called **SARAL - Simplified and Automated Research Amplification and Learning**.
- SARAL aims to **bridge the gap between complex scientific research and public understanding** by using **Artificial**

Intelligence (AI) to generate **layperson-friendly summaries** of research papers.

- This initiative marks a major step toward **democratising science communication** in India, crucial for an innovation-driven economy.

About SARAL

- **Full form:** Simplified and Automated Research Amplification and Learning.
- **Purpose:** To make scientific knowledge **accessible, understandable, and engaging** for the general public, students, and policymakers.
- **Technology:** Uses **AI-driven Natural Language Processing (NLP)** to extract key insights from scientific publications.
- **Outputs:** Generates **summaries in multiple formats** such as:
 - Short videos
 - Podcasts
 - Posters and infographics
 - Simplified presentations
- **Key Features**
 - **Layperson Summaries:** Translates highly technical research language into **simple, non-technical explanations**.
 - **Multimedia Outreach:** Moves beyond text to **audio-visual formats**, increasing engagement.
 - **Language Inclusivity (future potential):** Likely to support **Indian languages**, enhancing inclusivity in science communication.
 - **AI-driven Efficiency:** Reduces the time and effort needed to communicate research findings to the public.

- **Significance:** SARAL addresses a longstanding challenge – **scientific research often remains confined to academic circles** due to technical jargon and lack of effective dissemination.

Vision and Role of ANRF

- The **Anusandhan National Research Foundation** was created to be India's **central research funding body** and **single-window clearance mechanism** for R&D funding.
- **Key Objectives**
 - **Harness Deep Science & Engineering:** To support **deep tech products and start-ups** in sectors like:
 - Drug and chemical discovery
 - Aerospace design
 - Climate and weather modelling
 - Advanced materials and engineering design
- **AI Science and Engineering Open India Stack:** A proposed digital infrastructure to make AI tools and research resources accessible for innovation in India's scientific ecosystem.
- **Funding Mechanism:**
 - Receives **~70% of its budget from private sources**.
 - Offers funding to **universities, academic institutions, and private companies**.
 - Aims to **catalyse collaborations between academia and industry**.
- **Governance:** The **Governing Council** will identify and prioritise sectors for funding under national R&D objectives.

Policy Support and Financial Backing

In July 2025, the Union Cabinet approved a ₹1 lakh crore Research Development and Innovation (RDI) Scheme, which:

- Provides **low-interest, long-tenure loans** to private companies.
- Focuses on promoting **core R&D investment** in India's priority sectors.
- Supports the **Make in India and Atmanirbhar Bharat** visions by strengthening domestic research capacities.

Significance of SARAL

(a) For Science Communication

- Bridges the **knowledge gap** between scientists and citizens.
- Makes complex studies in **health, environment, technology, and climate** more accessible to policymakers, educators, and the general public.
- **Boosts scientific literacy**, helping society understand and support evidence-based policies.

(b) For Research Impact

- **Increases visibility** of Indian research outputs globally.
- Encourages **interdisciplinary collaboration** by simplifying technical findings.
- Enhances **knowledge transfer to industry**, accelerating product development.

(c) For Students and Young Innovators

- Provides simplified access to cutting-edge research, fostering **curiosity and innovation** among students.

Challenges Ahead

While promising, SARAL faces some challenges:

- **Accuracy of Summaries:** AI-generated summaries must **preserve scientific integrity** and avoid oversimplification.
- **Multilingual Barriers:** Need for translation into major Indian languages to ensure inclusivity.
- **Adoption by Researchers:** Scientists and

institutions must be willing to share and standardise their data.

- **Data Privacy and Copyright:** Ensuring secure handling of sensitive research data is critical.
- **Sustainability and Scaling:** Continuous funding and technological upgrades are necessary to keep SARAL relevant.

Way Forward

- **Strengthening AI Capabilities:** Develop domain-specific AI models to improve summary quality.
- **Building Public Trust:** Ensure transparency in algorithms and validation of outputs by expert committees.
- **Integration with Education:** SARAL's content can be incorporated into school and college curricula to promote STEM learning.
- **Language Diversification:** Expand summaries to regional languages for maximum outreach.
- **Public-Private Partnerships:** Collaborate with ed-tech, media, and academic platforms to amplify reach.

Conclusion:

- The launch of SARAL by ANRF represents a landmark initiative in India's journey toward democratising science and fostering an innovation ecosystem.

AI in Indian Classrooms: Transforming Teaching and Learning

Source: The Hindu

UPSC Relevance: GS3 Science and Technology

Context: AI in Indian Classrooms

Why in News?

AI integration in Indian classrooms is enhancing teaching and learning through personalized pedagogy, digital literacy, and administrative efficiency, while raising ethical and equity concerns.

Introduction

- The Artificial Intelligence (AI) is rapidly reshaping educational practices worldwide, and India stands at a pivotal juncture in integrating AI into its classrooms.
- With the **India AI Mission**, partnerships between global tech giants like **OpenAI, NVIDIA, Google, and Microsoft**, and domestic players such as Reliance, AI is no longer a futuristic concept but an evolving reality in India's educational ecosystem.
- However, while it promises enhanced pedagogy and inclusive learning, its unregulated adoption raises **ethical, social, and pedagogical challenges**.

Context and Significance

- The recent announcement of **OpenAI's first office in India** and **NVIDIA's collaboration with Reliance (2023)** underscores India's strategic role in the global AI revolution. Union IT Minister **Ashwini Vaishnaw** has emphasised India's potential to lead the **next wave of AI-led transformation**.
- To support this vision, the **India AI Mission** seeks to establish an ecosystem for **trusted, inclusive, and ethical AI**.
- In the education sector, this mission aligns with **Digital India** and **National Education Policy (NEP) 2020**, which stress **technology-enabled learning** to improve access, quality, and equity.

Tech-Savvy Pedagogy: Emerging Trends

- A report by the Central Square Foundation reveals that nearly 70% of Indian teachers are tech-savvy and use AI tools to design pedagogy, curate content, and personalise assessments.
- Examples include:
 - **Adaptive learning platforms** (like Mindspark and Byju's) tailoring lessons to students' abilities.
 - **ChatGPT-powered tools** assisting teachers in content creation, language translation, and doubt-solving.
- **AI-enabled analytics dashboards** for tracking student progress and learning outcomes.
- These practices, if effectively implemented, can improve **efficiency, accessibility, and learner-centricity** in classrooms.

Challenges of AI Integration

Despite its potential, the **meaningful integration of AI in education remains limited** due to structural and ethical issues:

(a) Digital Divide:

- According to the National Sample Survey (2025), while internet penetration has improved, inclusion depends on meaningful and relevant use, not just access.
- Rural schools often lack reliable connectivity, devices, and teacher training, which worsens inequalities.

(b) Ethical Dilemmas:

- The Centre for Teacher Accreditation (CENTA) survey notes that teachers often use AI for technical compliance rather than dialogic engagement.
- Similarly, CBSE's advisory against ChatGPT in board exams reflects concerns about academic dishonesty,

over-reliance on AI, and data privacy.

(c) Superficial Pedagogy:

- The mere use of audio-visuals or smartphones is often mistaken for pedagogic innovation.
- True transformation lies in enhancing teachers' critical and creative capacities to use AI meaningfully.

Philosophical Foundations of Pedagogy

- **Historically**, education in India, as envisioned by thinkers like Rabindranath Tagore and contemporary pedagogues like Bell Hooks, emphasised **humanistic dialogue, empathy, creativity, and emancipatory understanding in classrooms**.
- Unbridled AI risks reducing education to information delivery and rote learning, undermining the organic teacher-student relationship that fosters trust and curiosity.
- Hence, the philosophical challenge is to ensure AI augments rather than replaces these dialogic and humanistic elements.

India AI Mission and Institutional Support

The **India AI Mission** has introduced several initiatives to strengthen the AI ecosystem in education:

- **AI Centres of Excellence (CoEs):** To promote research, innovation, and best practices in EdTech.
- **India AI Compute Capacity:** Cloud-based infrastructure for affordable, large-scale AI access.
- **India AI Future Skills:** Skill development for teachers and students to navigate AI tools.
- **Application Development Initiative:**

Context-sensitive AI applications for socio-economic transformation.

- For these to succeed, **in-service teacher training** must focus not just on technical proficiency but also on **ethical reasoning, inclusivity, and creativity**.

Transformative Potential of AI in Education

When integrated thoughtfully, AI can bring about:

- **Personalised Learning:** Customised lesson plans and assessments based on students' learning curves.
- **Inclusive Education:** AI-driven speech-to-text, translation, and adaptive devices benefiting differently-abled students and multilingual classrooms.
- **Data-Driven Insights:** Predictive analytics to identify learning gaps early.
- **Administrative Efficiency:** Automating grading and routine tasks, allowing teachers more time for mentoring.
- **Bridging Regional Disparities:** Cloud-based solutions can make quality resources available even in remote areas.

Risks of Unchecked AI Use

- **Reinforcing Inequalities:** Without equitable access, AI might widen the **urban-rural and socio-economic gaps**.
- **Loss of Critical Thinking:** Over-reliance on AI-generated answers can reduce students' problem-solving skills.
- **Ethical Concerns:** Issues of **privacy, algorithmic bias, and misuse** in exams or plagiarism.
- **Technocratic Pedagogy:** Risk of sidelining human empathy and creativity in favour of mechanical efficiency.

Way Forward

To harness AI's potential while addressing its pitfalls:

- **Bridging the Digital Divide:** Invest in **infrastructure, affordable devices, and connectivity** in rural and underserved areas.
- **Teacher Capacity-Building:** Prioritise **in-service training on ethical AI use, critical pedagogy, and cultural sensitivity**.
- **Ethical Guidelines and Regulation:** Establish clear **AI-use policies for schools**, ensuring **privacy, transparency, and accountability**.
- **Inclusive Curriculum Design:** Develop **AI literacy modules** for students to promote responsible use.
- **Balanced Approach:** Maintain the **humanistic essence of education** while using AI to enhance—not replace—teacher-student dialogue.
- **Monitoring and Evaluation:** Continuous research on AI's impact on **learning outcomes, equity, and classroom interaction**.

Conclusion:

- AI holds **transformative promise for Indian classrooms**, with the potential to **enhance access, quality, and inclusivity** in education.
- However, as the article rightly notes, without a **social, ethical, and cultural anchorage**, AI risks being reduced to a **rhetorical tool defended in theory but abused in practice**.

Macroscopic Quantum Tunnelling and the 2025 Physics Nobel Prize

Source: The Hindu

UPSC Relevance: GS3 Science and Technology

Context: Quantum Tunnelling

Why in News?

Recently, EAM S. Jaishankar emphasised that India's national interests are best secured through strategic autonomy and multi-alignment in a multipolar world.

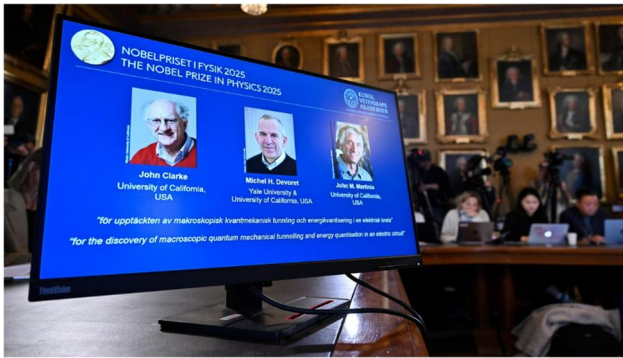


Image Source: The Hindu

Background:

- The 2025 Nobel Prize in Physics was awarded to **John Clarke**, **Michel H. Devoret**, and **John M. Martinis** for their pioneering experiments demonstrating **macroscopic quantum tunnelling** in superconducting circuits.
- This work fundamentally extended quantum mechanics from the microscopic world of atoms and subatomic particles to **macroscopic electrical circuits**, bridging foundational physics and practical technology.
- Quantum mechanics traditionally describes phenomena at atomic and subatomic scales—electrons, photons, and nuclei can “tunnel” through energy barriers that they classically cannot

surmount. The Nobel-recognised experiments proved that **macroscopic systems**, visible to the naked eye, could also exhibit such tunnelling behavior, a breakthrough with profound implications for both theory and technology.

Josephson Junctions: The Key Experimental Platform

- The **Josephson junction** was central to the laureates' work.
- Structure:** Two superconductors separated by a very thin insulating layer.
- Function:** Electrons in superconductors form pairs (Cooper pairs) that move without resistance. The **phase difference** of the superconducting order parameter across the junction acts as a macroscopic quantum variable.
- Goal of Experiment:** Investigate whether this macroscopic variable behaves as a single quantum particle, capable of **tunnelling** and displaying **discrete energy levels**.
- Classical vs Quantum Prediction:**
 - In classical physics, if the current is below a critical threshold, electron flow remains blocked indefinitely.
 - Quantum mechanics predicts that the trapped electrons can **tunnel through the barrier**, producing a measurable voltage, even if the system is macroscopically large.
- Challenges in Observing Macroscopic Quantum Effects**
 - Observing quantum phenomena in macroscopic circuits is extremely delicate due to **environmental noise**:
 - Thermal fluctuations** could mimic tunnelling, requiring ultra-low temperatures to suppress them.
 - Electromagnetic interference** from stray microwaves could distort

measurements.

- **Solution by Clarke, Devoret, and Martinis:**
 - Redesigned experiments with **special filters and shielding** to block external signals.
 - Cooled the system to near absolute zero for stability.
 - Applied **faint, precisely tuned microwave pulses** to probe the circuit without disturbing its quantum state.
- **Outcome:** The measured behavior of the Josephson junction **matched quantum tunnelling predictions**, confirming macroscopic quantum phenomena.

Quantum Tunnelling

- Quantum tunnelling is a phenomenon in quantum mechanics where a particle **crosses an energy barrier** even when it does not have sufficient classical energy to overcome it.
- Unlike classical physics, where the particle would be reflected, quantum mechanics allows a **finite probability** of the particle “tunnelling” through the barrier due to its **wave-like nature**.

Evidence of Quantum Behaviour

- **Macroscopic Quantum Tunnelling:**
 - The circuit could “escape” from a trapped state despite classical barriers.
 - Temperature-independent tunnelling rates confirmed the quantum nature of the phenomenon.
- **Discrete Energy Levels:**
 - By applying microwaves of different frequencies, the circuit transitioned between specific energy levels.
 - The system absorbed or emitted **quantized packets of energy**, behaving analogously to a single

quantum particle or atom.

- This demonstrated that a **macroscopic electrical system could obey quantum mechanics**, a revolutionary finding.

Technological Implications

The laureates’ work laid the foundation for several **emerging quantum technologies**:

- **Superconducting Qubits:** Using Josephson junctions as qubits in quantum computers. Enabled **circuit quantum electrodynamics (cQED)**—coupling qubits with resonators to manipulate and read quantum states.
- **Quantum Amplifiers:** Amplify extremely weak signals without adding noise. Useful in **medical diagnostics** and **fundamental physics experiments** (e.g., dark matter searches).
- **Precision Measurements:** Measure current, voltage, and other physical quantities with unprecedented accuracy.
- **Quantum Networks:** Microwave-to-optical converters link quantum processors to fiber-optic networks, critical for **quantum communication**.
- **Quantum Simulators:** Model complex materials or chemical reactions at the atomic level, aiding **material science** and **pharmaceutical research**.

Quantum Science

- Quantum science (or quantum physics/quantum mechanics) is the branch of physics that studies the behavior of matter and energy at **atomic and subatomic scales**, where the classical laws of physics no longer apply.
- Unlike classical physics, which describes large objects like planets or cars, quantum science deals with particles such as **electrons, photons, atoms, and molecules**. At these scales, phenomena

like **wave-particle duality, superposition, and tunnelling** become important.

- **Key Principles of Quantum Science**

- **Wave-Particle Duality:**

- Particles such as electrons and photons behave **both as particles and waves**.
 - Example: Light can behave as a wave (interference, diffraction) or as particles (photons in the photoelectric effect).

- **Quantum Superposition:**

- A particle can exist in **multiple states simultaneously** until measured.
 - Example: Schrödinger's cat thought experiment – a cat can be both alive and dead until observed.
 - Practical use: Quantum computers exploit superposition to process many possibilities at once.

- **Quantization of Energy:**

- Energy in quantum systems exists in **discrete amounts (quanta)**, not continuous.
 - Example: Electrons in an atom occupy discrete energy levels; they absorb or emit energy in packets called **photons** when jumping between levels.

- **Quantum Entanglement:**

- Two particles can become linked so that the **state of one instantly affects the other**, regardless of distance.
 - Example: Used in **quantum communication** and **quantum encryption**.

- **Quantum Tunnelling:**

- Particles can **pass through energy barriers** even if they do not have

enough energy classically.

- Example: Nuclear fusion in the Sun relies on tunnelling of protons.
- Macroscopic quantum tunnelling (2025 Nobel) shows this can occur in **large, visible circuits**.

- **Applications of Quantum Science**

- Quantum science is not just theoretical—it has **transformative technologies**:
 - **Quantum Computing:** Uses qubits (quantum bits) to perform complex calculations much faster than classical computers.
 - **Quantum Communication:** Quantum key distribution ensures **unbreakable encryption** using entanglement.
 - **Quantum Sensors:** Extremely precise measurements of time, magnetic fields, and gravitational waves.
 - **Medical Imaging & Electronics:** MRI technology, semiconductors, and superconductors rely on quantum physics.
 - **Quantum Materials:** Superconductors, topological insulators, and other materials have applications in **energy and electronics**.

Significance

- The work exemplifies the **interplay between fundamental research and technology**. By demonstrating quantum effects in visible, controllable systems, the laureates turned what was once considered a limitation—a circuit's sensitivity to external influences—into a practical advantage.
- Their research not only confirms quantum theory at larger scales but also

provides tools for manipulating information in fundamentally new ways, ushering in the era of quantum engineering.

India Mobile Congress 2025: 6G Mission Projected to Add \$1.2 Trillion to GDP by 2035

Source: PIB

UPSC Relevance: GS3 Science and Technology

Context: India Mobile Congress 2025

Why in News?

The India Mobile Congress 2025 and the International 6G Symposium showcased India's technological self-reliance, next-generation telecom innovations, and global 6G ambitions.



(Image Source: ET Government)

Introduction

- The 9th edition of India Mobile Congress (IMC) 2025, Asia's largest telecom, media, and technology event, was inaugurated by Prime Minister Narendra Modi in New Delhi.
- The event, organised jointly by the Department of Telecommunications (DoT) and the Cellular Operators Association of India (COAI), underscores India's commitment to leveraging innovation for digital transformation, technological self-reliance, and global leadership in next-

generation telecom technologies.

Key Highlights

- **Technological Growth and Atmanirbhar Bharat:**
 - PM Modi emphasised India's evolution in telecom, noting **six-fold growth in electronics production** and a **28-fold increase in mobile manufacturing** since 2014.
 - The development of the **Made-in-India 4G stack** reflects technological self-reliance and export readiness.
 - Support through initiatives like the **Telecom Technology Development Fund** has catalysed startup innovation in areas such as **quantum communication, 6G, and financial fraud prevention**.
- **Telecommunications Act and Cybersecurity:**
 - Enactment of the **Telecommunications Act** facilitates **faster approvals and network expansion**.
 - Strengthened cyber laws and grievance redressal mechanisms ensure **secure digital operations** for consumers and industry stakeholders.
- **Digital Public Infrastructure and Startups:**
 - India's digital revolution has led to a **98% reduction in mobile data costs**.
 - Platforms like IMC 2025 showcase the **thriving startup ecosystem**, exemplified by events such as the **Startup World Cup 2025**.

6G: The Next-Generation Mobile Network

- 6G, or **sixth-generation wireless technology**, is envisioned as the successor to 5G. India aims to leverage 6G for technological self-reliance, global

leadership, and economic growth, with targets like securing 10% of global 6G patents and contributing \$1.2 trillion to GDP by 2035.

- **Key Features of 6G**

- **Ultra-High Data Rates:**
 - Expected to provide **1 Tbps (terabit per second)** speeds, significantly higher than 5G.
 - Enables **real-time immersive experiences**, advanced virtual and augmented reality, and ultra-high-definition content streaming.
- **Low Latency:**
 - Latency may reduce to **sub-millisecond levels**, enabling **instantaneous communication** for applications like autonomous vehicles and industrial automation.
- **Massive Connectivity:**
 - Supports **massive machine-type communications (mMTC)** with trillions of connected devices, crucial for IoT and smart cities.
- **Advanced AI Integration:**
 - AI will be **deeply embedded in network operations**, enabling predictive maintenance, network self-optimization, and intelligent spectrum management.
- **Use of Terahertz Spectrum:**
 - 6G will leverage **higher frequency bands (100 GHz - 1 THz)** for ultra-fast data transmission, with challenges in propagation and coverage being addressed through advanced antennas and satellites.
- **Integrated Communication Platforms:**
 - 6G will combine **terrestrial, satellite, and aerial networks**, ensuring global coverage,

particularly in remote and underserved areas.

- **Applications of 6G**

- **Smart Cities and Infrastructure:** Enables **autonomous transport systems, smart grids, and real-time traffic and resource management.**
- **Healthcare and Telemedicine:** Supports **holographic consultations, remote surgery, and real-time health monitoring** with ultra-low latency.
- **Industrial Automation:** Facilitates **Industry 4.0 and Industry 5.0**, with fully automated factories, robotics, and AI-driven production lines.
- **Education and Entertainment:** Enables **immersive AR/VR learning environments** and ultra-realistic media experiences.
- **Agriculture and Environment:** Precision farming using IoT sensors, drones, and AI-powered monitoring for improved crop yield and resource efficiency.

- **India's 6G Vision**

- **Global Leadership:** India aims to **co-lead the 6G revolution**, focusing on **indigenous R&D, international collaboration, and swadeshi telecom ecosystems.**
- **Economic Impact:** Expected contribution to **\$1.2 trillion GDP by 2035.**
- Creation of high-value jobs in **research, manufacturing, and telecom services.**
- **Patent and Innovation Goals:** Targeting **10% of global 6G patents**, with strong emphasis on AI, IoT, and satellite integration.
- **International Collaboration:** India is partnering with **global organisations like the European Space Agency, NASSCOM, and academia** to foster standardisation and joint technology development.

International 6G Symposium 2025

- **Launch and Purpose:** Inaugurated by Union Communications Minister **Jyotiraditya Scindia** and Dr. Neeraj Mittal, the symposium focuses on **next-generation 6G technologies, global research collaborations, and standardisation efforts.**
- **Bharat 6G Alliance Initiatives:**
 - Signed **MoUs with NASSCOM and the European Space Agency** to foster joint technology development.
 - Released **four whitepapers:**
 1. *Spectrum Roadmap for 6G in India*
 2. *Powering Next-Gen Telecom*
 3. *AI and Network Evolution to 5G*
 4. *6G Architecture, Security and Exposure Framework for RF Sensing*

A **joint declaration on 6G principles** was presented, emphasizing global cooperation.

- **India's 6G Vision:**
 - Projected contribution to **\$1.2 trillion GDP by 2035.**
 - Target of **10% of global 6G patents.**
 - Focus on **satellite communications market growth**, expected to triple by 2033.
 - Promotion of **Swadeshi telecom ecosystems**, including the launch of **1 lakh Made-in-India 4G towers**, enabling a **future-ready 6G framework.**

Industry and Innovation Showcase

- Over 400 exhibitors presented cutting-edge innovations, spanning Optical Communications, Semiconductors, Quantum Communications, and AI-driven fraud prevention.
- Emphasis was placed on public-private collaboration, start-up engagement, and global partnerships to foster a secure, inclusive, and technologically advanced telecom ecosystem.

Implications for India

- **Technological Self-Reliance:** Development of indigenous 4G and 6G technologies reduces dependency on foreign suppliers, aligning with **Atmanirbhar Bharat.**
- **Economic Growth and Employment:** 6G and related technologies are expected to generate **high-value jobs**, enhance exports, and drive GDP growth.
- **Global Leadership:** By actively participating in **6G standardisation and international collaborations**, India positions itself as a **co-leader in the global telecom ecosystem.**
- **Digital Inclusion and Cybersecurity:** Expansion of telecom infrastructure and digital services improves **connectivity for remote regions** while maintaining robust **cybersecurity frameworks.**
- **Startups and Innovation Ecosystem:** IMC 2025 strengthens the link between **academia, startups, and policymakers**, fostering innovation in next-generation connectivity technologies.

Conclusion:

- The **India Mobile Congress 2025** and **International 6G Symposium** highlight India's **transition from a technology consumer to a global technology architect.**

Global Team Wins 2025 Nobel Prize in Chemistry for Bridging Metals and Organic Molecules

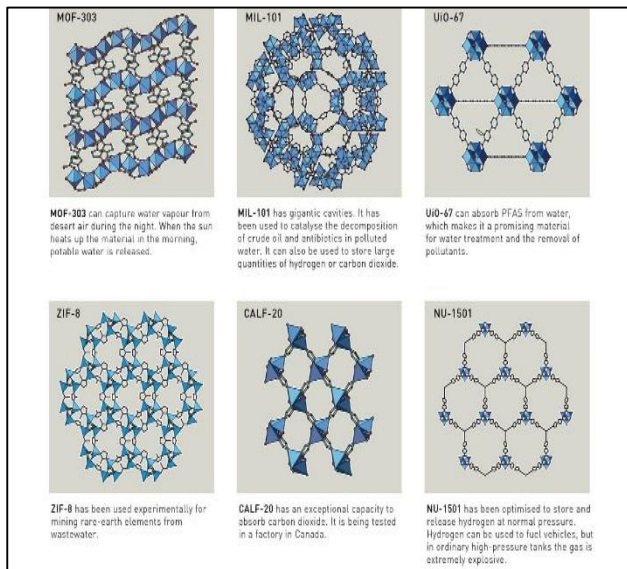
Source: The Hindu

UPSC Relevance: GS3 Science and Technology

Context: Pioneering Metal-Organic Frameworks

Why in News?

The 2025 Nobel Prize in Chemistry was awarded to Susumu Kitagawa, Richard Robson, and Omar Yaghi for pioneering Metal-Organic Frameworks (MOFs).



(Image Source: The Hindu)

Background:

- The **2025 Nobel Prize in Chemistry** was jointly awarded to **Susumu Kitagawa (Japan)**, **Richard Robson (UK)**, and **Omar M. Yaghi (USA/Jordanian-American)** for their groundbreaking work on **Metal-Organic Frameworks (MOFs)**—a versatile class of materials that combine metallic ions and organic molecules to form stable, porous structures with wide-ranging applications.

What are Metal-Organic Frameworks (MOFs)?

- Definition:** MOFs are **crystalline materials composed of metal ions or clusters coordinated to organic ligands**, forming a porous, lattice-like structure.
- Structure:** They can be visualized as **diamond-like frameworks with countless cavities**, allowing storage, filtration, or chemical transformation within their pores.

- Key Feature:** Flexibility – some MOFs, unlike rigid materials like zeolites, can **expand and contract** in response to environmental changes, similar to a “breathing” system.

Journey of Discovery

- Richard Robson (UK/Australia):**
 - Robson conceptualised the combination of metal ions (like copper) with four-armed organic molecules to form spacious crystals.
 - His early MOFs were unstable and prone to collapse, but they laid the foundation for future work.
- Susumu Kitagawa (Japan):**
 - Focused on creating porous molecules at Kyoto University.
 - Developed flexible MOFs that could allow gases to flow in and out, demonstrating that MOFs could change shape yet remain stable.
 - His work enabled the concept of **soft MOFs**, surpassing the rigidity of zeolites.
- Omar M. Yaghi (USA/Jordanian-American):**
 - At the University of California, Berkeley, he developed highly stable MOFs that could be rationally designed for specific applications.
 - Demonstrated practical uses such as harvesting water from desert air, capturing carbon dioxide, and removing environmental contaminants.

Significance and Applications

- Environmental Protection:** MOFs can filter toxic PFAS chemicals from water and break down pharmaceutical residues, reducing pollution.
- Water Harvesting:** Some MOFs can draw water vapor from air at night and release

it as liquid water during the day, addressing water scarcity in arid regions.

- Carbon Capture: MOFs provide a highly efficient medium for capturing CO₂, aiding in climate-change mitigation.
- Customizable and AI-Driven Design: Researchers have created modular molecular kits allowing MOFs to be rationally designed or AI-optimized for various applications, from gas storage to catalysis.

Why MOFs Won the Nobel Prize

- MOFs represent a **bridge between metals and organics**, which were previously considered chemically incompatible.
- They demonstrate a **remarkable combination of flexibility and stability**, unlike traditional materials such as zeolites.
- Their **real-world applicability** spans **energy, environment, and water management**, making them highly valuable for global challenges.
- The **collaborative journey across continents**—from conceptualisation, experimentation, to application—highlights the **cumulative nature of scientific innovation**.

Global Impact and Future Prospects

- Tens of thousands of MOFs have been developed since the original discoveries, each with unique structures and chemical properties.
- Potential applications include gas storage, drug delivery, catalysis, environmental cleanup, and climate solutions.
- The modular design approach allows for AI-assisted optimization, paving the way for next-generation functional materials.

Conclusion:

- The 2025 Nobel Prize in Chemistry celebrates not only the creation of Metal-Organic Frameworks but also the vision, persistence, and global collaboration of scientists in bridging a fundamental chemical divide.

U.S. Immigration Policies and the Brain Drain of STEM Talent

Source: The Hindu

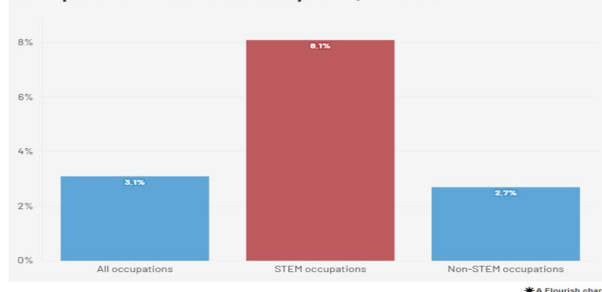
UPSC Relevance: GS3 Science and Technology

Context: H1-B visa and STEM

Why in News?

The U.S.'s \$100,000 H-1B visa fee risks discouraging foreign STEM talent, potentially slowing growth in IT, healthcare, and science sectors.

Projected change in employment for STEM and non-STEM occupations in the 2024–2034 period, in the U.S



(Image Source: The Hindu)

Introduction

- The United States has long relied on foreign-born talent, particularly in **STEM (Science, Technology, Engineering, and Mathematics)** fields, to fuel its innovation and economic growth.
- However, recent policy changes, notably the **\$100,000 H-1B visa fee** introduced under the Trump administration, raise concerns about whether the U.S. risks

undermining its competitive edge by discouraging skilled foreign workers.



(Image Source: The Hindu)

STEM: Overview and Significance

- The acronym **STEM** (Science, Technology, Engineering, and Mathematics) was introduced in **2001** by the **U.S. National Science Foundation (NSF)**. Earlier, the term used was **SMET**.
- STEM represents an **interdisciplinary and applied approach to education**, integrating knowledge and skills from the four disciplines to prepare students for complex problem-solving.

Global and Indian Context:

- India ranks among the top countries in producing **scientists and engineers**, and the emphasis on STEM education has grown significantly in recent years.
- **Constitutional Mandate:** Under **Article 51A of the Indian Constitution**, it is a citizen's duty to develop **scientific temper, humanism, and a spirit of inquiry**.

Significance of STEM Education:

- Encourages **critical thinking, problem-solving, and innovation**, preparing the next generation for advanced technological challenges.
- According to the NSF, **80% of jobs in the next decade** will require some level of **math or science skills**, underscoring STEM's relevance to economic growth

and workforce development.

Current Role of Foreign-Born Talent in the U.S. Economy

- **IT Sector Dependence:**
 - Between 2016 and 2024, jobs in the U.S. IT sector – defined as “computer and mathematical occupations” – grew by approximately **40%**, making it one of the fastest-growing segments of the labor market. Other sectors with strong growth include **healthcare support** and **life/physical/social sciences**.
- **Foreign-Born Workforce Share:**
 - About **25% of the workforce** in these sectors in 2024 comprised foreign-born professionals, a proportion that has remained largely unchanged since 2016.
 - This highlights the **stagnation in domestic STEM participation** despite overall job growth and underscores the U.S. economy's reliance on foreign talent.
- **Future STEM Demand:**
 - STEM occupations are projected to grow by over **8% in the next decade**, compared to just 2.7% for non-STEM jobs, emphasizing the critical need for a **skilled workforce**. Current trends indicate that U.S. residents are not producing enough STEM graduates to meet this demand.
 - Between 2011–12 and 2020–21, **non-residents earning STEM bachelor's degrees rose by 148%**, while growth among U.S. residents was only 47%. At the Master's level, only **55% of graduates were residents**, highlighting dependence on international students for future innovation capacity.

Implications of the \$100,000 H-1B Visa Fee

- **Disincentivising Foreign Talent:** The fee disproportionately affects **Indian STEM professionals**, who form a substantial portion of H-1B visa holders. Beyond IT outsourcing firms, **American tech giants** like Apple, Microsoft, and Meta also rely heavily on H-1B talent.
- **Potential Talent Diversion:** Several competing nations have responded proactively:
 - **China:** Promoting its “K visa” as an alternative.
 - **U.K.:** Considering reduced visa fees for STEM workers.
 - **Germany, South Korea, Japan:** Actively courting foreign professionals.
- These initiatives suggest that if the U.S. continues to impose high barriers, **global STEM talent may increasingly choose other destinations**, potentially slowing innovation and job growth domestically.

Challenges in Domestic STEM Production

- The slower pace of STEM education uptake among U.S. residents—especially at advanced degree levels—indicates that **homegrown talent alone cannot meet projected demand**.
- Policies that deter foreign students and professionals thus risk creating **critical skill shortages**, particularly in high-growth sectors such as IT, life sciences, and advanced engineering.

Indian Government Initiatives to Promote Women in STEM

1. Women in STEMM (WiS) Program:

- Launched by the **Department of Science and Technology (DST)**.
- Provides **scholarships, fellowships, research grants, mentorship, and**

networking opportunities for women in STEM.

2. Vigyan Jyoti:

- Introduced in **2019–20** to encourage girls in classes **9–12** to pursue higher education and careers in STEM.
- Offers **workshops, mentoring, and resources** for young women, supporting them from school to **PhD-level education**.

3. Women in Science and Engineering - KIRAN (WISE-KIRAN):

- Encourages women scientists to engage in research in **frontier areas of science and engineering**.
- Promotes **S&T-based internships, entrepreneurship, and societal problem-solving**.
- Specifically addresses challenges faced by women taking **career breaks** due to motherhood or family responsibilities, providing opportunities for those aged **27–57 to re-enter mainstream research and technology work**.

Conclusion:

- The \$100,000 H-1B visa fee presents a paradox: while intended to prioritize domestic employment, it may **undermine the U.S.’s long-term competitiveness** in STEM sectors.
- With global competitors actively courting skilled professionals, the U.S. risks **losing both current and future STEM talent**.

India’s 4G Stack and Its Potential to Counter China’s Digital Silk Road

Source: Indian Express

UPSC Relevance: GS 3 Science and Technology

Context: 4G Stack in India

Why in News?

Kaziranga Director becomes first Indian to receive IUCN award for innovation in national parks.

Introduction

- In October 2025, Prime Minister Narendra Modi highlighted the launch of India's **indigenously developed 4G stack** by BSNL, Tejas Networks, TCS, and the Centre for Development of Telematics (C-DOT) at the **9th India Mobile Congress (IMC)** in Delhi.
- This development marks a significant step in India's pursuit of **digital sovereignty**, reducing dependence on foreign vendors, and positioning India as an exporter of telecom infrastructure.
- India now joins an **elite group of countries**—Denmark, Sweden, South Korea, and China—capable of manufacturing and deploying their own 4G telecom equipment.

What is the 4G Stack?

- A **4G stack** refers to a complete ecosystem of hardware and software that enables 4G mobile network services, including:
- **Radio Access Network (RAN)** – provided by Tejas Networks, responsible for wireless communication between user devices and the network.
- **Core Network (CN)** – provided by C-DOT, managing data routing, mobility, and subscriber management.
- **Integration & Data Centres** – handled by TCS, which installed and commissioned network infrastructure at over 100,000 sites and provides 24/7 network monitoring via its Cognitive Network Operations platform.

Key Features

- **Indigenous development** reduces reliance on foreign vendors, enhancing **national security** and **strategic autonomy**.
- **5G-ready architecture** ensures future scalability and migration without replacing large parts of deployed infrastructure.
- **Rapid upgrades and easier management** via domestic software and control systems.
- **Export-readiness:** Several developing countries have shown interest, indicating potential for India to compete globally.



(Image Source: Indian Express)

Strategic Implications

1. Digital Sovereignty

- India's 4G stack allows **control over critical communication networks**, ensuring protection against cyber vulnerabilities and foreign interference.

2. Export Potential

- By offering an **affordable, indigenous alternative** to Chinese telecom infrastructure, India can challenge China's dominance in emerging markets.

3. Countering China's Digital Silk Road (DSR)

- **China's DSR** is part of the Belt and Road Initiative, financing digital connectivity in Africa, Asia, and Latin America.
- Chinese firms like **Huawei and ZTE** dominate 4G infrastructure in Africa (~70% market share) and were first to

offer 5G services.

- India's offering could serve as a strategic counterweight, promoting competition and reducing dependency on Chinese technology.

India Stack and Digital Public Infrastructure (DPI)

Alongside the 4G stack, India is developing **India Stack**, a digital public infrastructure that includes:

- Digital identity solutions** (e.g., Aadhaar)
- Payment systems** (e.g., UPI)
- Data management tools**
- This DPI can be exported, offering a **comprehensive digital solution** to other developing countries, complementing the 4G stack.

Feature	4G	5G	6G (Emerging)
Generation	Fourth Generation	Fifth Generation	Sixth Generation
Launch Period	2009–2012	2019 onwards	Expected 2030+
Key Technology	LTE (Long Term Evolution), OFDMA, MIMO	mmWave, Massive MIMO, Network Slicing, Edge Computing	Terahertz (THz) communication, AI-native networks, holographic communication
Peak Data Speed	100 Mbps (mobile), 1 Gbps (stationary)	10–20 Gbps	1 Tbps+ (theoretical)

Latency	~50 ms	~1–10 ms	~0.1 ms
Bandwidth	20 MHz–100 MHz	100 MHz–1 GHz	1–10 THz
Connectivity	Mobile internet, HD streaming, VoLTE	IoT, Smart cities, autonomous vehicles, AR/VR	Holographic calls, immersive XR, brain-computer interfaces, pervasive AI
Network Architecture	Centralized	Decentralized + Cloud-native	Fully AI-driven, integrated terrestrial + satellite networks
Applications	Mobile browsing, video streaming, video calls	Smart cities, industrial automation, connected vehicles	Tactile internet, holographic communications, ultra-intelligent society
Deployment Status	Mature, global	Growing, several countries adopted	Experimental, research phase
Examples of Use	4G mobile networks in India, LTE services	5G trials and commercial rollout by Jio, Airtel, BSNL	Research projects by China, US, EU, India (6G initiatives ongoing)

Challenges Ahead

- India's 4G stack may **not yet match**

China's technological sophistication in certain areas.

- Pricing, financing, and global perception will be crucial in **competing with Chinese firms**, who benefit from state-backed loans and aggressive foreign policy.
- Establishing trust in new technology and ensuring **long-term maintenance and upgrades** in foreign markets will be critical.

Conclusion:

India's indigenously developed 4G stack represents a **strategic and technological milestone**, promoting digital sovereignty, reducing dependency on foreign vendors, and opening avenues for exports.

Internet and Social Cohesion – Rethinking Governance and Platform Economics for Balanced Discourse

Source: Down To Earth

UPSC Relevance: GS 3 Science and Technology

Context: Internet and Social Cohesion

Why in News?

The World Wide Web, once envisaged as a force for global connection and democratic exchange, is increasingly implicated in social fragmentation and affective polarisation

Introduction

- When Tim Berners-Lee created the World Wide Web, the goal was universal access to information and easier global communication. Over three decades, the web and social media platforms have transformed communication, commerce, and politics.

- Yet empirical studies and public discourse now indicate that rather than only uniting people, online ecosystems can deepen social divides – producing echo chambers, amplifying misinformation, and incentivising polarising content.

How the Web Amplifies Division: Mechanisms and Evidence

Engagement-driven algorithms:

- Most major platforms optimise for engagement (clicks, time on site, reactions). Emotionally charged content – outrage, fear, moral indignation – elicits strong reactions and shares, so algorithms preferentially surface such content.
- Simulation and observational studies show that anger and high-arousal emotions spread faster and wider, creating feedback loops that reward polarising posts.

Partisan sorting and affective polarisation:

- Repeated exposure to political messaging from in-group influencers and adversarial coverage of out-groups leads not only to policy disagreement but to affective distancing – liking those who think like us and disliking others.
- This “affective polarisation” is associated with reduced social trust and increased hostility in public life.

Information cascades and confirmation bias:

- Users searching for more information after seeing a sensational post often encounter content that reuses the same framing and keywords, reinforcing the original (sometimes false) impression.
- Cognitive states such as high emotion reduce critical evaluation and increase susceptibility to misinformation.

Platform economics and incentives:

- Platforms monetise attention via advertising; therefore, content that maximises attention (often polarising content) is financially rewarded. Internal metrics — including emphasis on reaction types like anger — have historically amplified divisive signals.



(Image Source: Down TO Earth)

Societal Costs

- **Democratic erosion:** Polarised publics find compromise harder; civic discourse degrades; trust in institutions falls.
- **Public health and safety:** Misinformation (e.g., health myths) can endanger lives; online hate and coordinated harassment can lead to offline violence.
- **Economic and governance burden:** Counter-misinformation campaigns, policing of online harms, and mental-health costs place burdens on public resources.
- **Social capital decline:** Community ties and cross-cutting networks weaken, affecting cooperation at local and national levels.

Why Individual Behaviour Alone Is Insufficient

- Research suggests people do encounter opposing views and sometimes seek them out. However, when the platform economy monetises outrage, individual restraint becomes costly to the attention

marketplace. While better digital behaviour (not sharing “rage bait”, seeking diverse sources) helps, it cannot correct structural incentives that favour polarisation at scale.

Policy and Structural Responses: A Multi-Pronged Approach

Algorithmic transparency and oversight:

- Require disclosure of ranking criteria, amplification metrics, and impact assessments for political content.
- Establish independent audits (public or regulator-appointed) to evaluate whether algorithms disproportionately amplify polarising content.

Platform accountability & regulation:

- Update intermediary liability frameworks to balance free expression with responsibilities to curtail demonstrable harms (hate speech, coordinated disinformation).
- Regulatory sandboxes can allow testing of de-amplification interventions with oversight.

Economic levers — tax and regulation:

- Consider targeted levies on platform advertising revenue to fund public interest journalism, digital literacy, and moderation capacity.
- Tie certain tax or regulatory benefits to demonstrable reductions in harmful amplification (e.g., quarterly harm-reduction audits).

Competition and data portability:

- Promote interoperability and data portability so users can migrate across platforms, lowering network-effect lock-in and enabling new entrants with healthier incentive models.
- Antitrust interventions where platform market power distorts public discourse.

Promote alternative platform economics:

- Encourage non-advertising models (subscriptions, public funding,

cooperative ownership) for social platforms to reduce dependency on outrage-maximising metrics.

- Support public or mission-driven platforms for civic discourse and local governance.

Strengthen content governance & moderation capacity:

- Invest in transparent, rights-respecting content moderation systems with appeal and redress mechanisms.
- Combine automated tools with human moderators, especially for nuanced political and cultural content.

Boost public interest infrastructure:

- Fund high-quality public-interest media and fact-checking networks that can compete for attention with polarising narratives.
- Support civic platforms that facilitate deliberative engagement (e.g., moderated townhalls, deliberative polling tech).

Digital literacy and civic education:

- Scale up programs that teach source evaluation, emotional regulation online, and the mechanics of platform amplification.
- Embed media literacy in school curricula and public campaigns.

International cooperation:

- Online harms and platform markets are transnational; regulatory coordination (standards, cross-border data access for law enforcement and audits) is essential.

Practical Trade-offs and Safeguards

- **Free speech considerations:** Any intervention must be careful not to stifle legitimate dissent; rulemaking should be transparent, narrowly tailored, and subject to judicial review.
- **Regulatory capture risk:** Ensure oversight bodies are independent, with

multi-stakeholder governance (civil society, academia, industry).

- **Innovation vs safety balance:** Avoid measures that inadvertently entrench incumbents; promote open standards that enable innovation in healthier platform design.

Role of Citizens and Civil Society

- **Personal conduct:** Individuals reducing engagement with polarising posts, avoiding sharing unverified claims, and promoting cross-cutting dialogue can blunt incentives at the margin.
- **Collective action:** Civil society can advocate for regulatory reforms, audit platforms, and build alternative public-interest communication tools.
- **Research & evidence:** Independent research into platform impacts, replication studies, and public disclosure of harms will guide better policy.

Conclusion:

- The fragmentation of discourse online is less a technology failure than an **economic and governance problem**. Fixing it requires **structural change**: reframing platform incentives, regulatory oversight, investment in public interest alternatives, and broad civic engagement.

Chandrayaan-2 Makes First-Ever Observation of Sun's Impact on Moon: ISRO

Source: The Hindu

UPSC Relevance: GS Paper 3 - Science & Technology (Indian Space Programme, Space Weather) | GS Paper 1 - Geography (Solar Phenomena)

Context: Successive CMEs from the Sun struck the Moon

Why in News

The CHACE-2 (Chandra's Atmospheric Composition Explorer-2) payload aboard the Chandrayaan-2 lunar orbiter has, for the first time ever, recorded the direct impact of a Solar Coronal Mass Ejection (CME) on the Moon's exosphere – the Moon's extremely thin outer atmosphere.

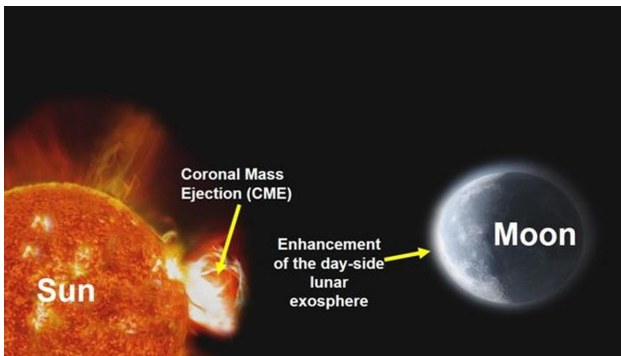


Image Source: The Hindu

Key Scientific Findings

- **Observation Details:**
 - CHACE-2 detected a sharp rise in **total pressure and number density** (neutral atoms + molecules) in the **dayside lunar exosphere**.
 - The density increased by **more than one order of magnitude**, confirming long-theorized predictions of solar particle impact.
- **Mechanism:**

The intense burst of **solar plasma and magnetic fields** in the CME bombarded the Moon's surface, **knocking atoms off the regolith** (mainly sodium, potassium, and argon). These liberated atoms temporarily thickened the lunar exosphere before dissipating.
- **Scientific Significance:**
 - First **direct empirical evidence** of CME-induced space-weather effects on a non-atmospheric body.
 - Validates earlier **theoretical space-environment models** developed by

Indian and global scientists.

- Demonstrates CHACE-2's precision in detecting trace gases and pressure variations in near-vacuum conditions.

About CHACE-2 and Chandrayaan-2

- **CHACE-2:** Developed by ISRO's Space Physics Laboratory, it measures **neutral composition, pressure, and temperature** of the lunar exosphere.
- **Chandrayaan-2 Orbiter:** Launched **July 22 2019** aboard **GSLV Mk-III-M1**, carrying **eight payloads** for lunar mapping, mineral detection, and exospheric studies.
 - Although the **Vikram lander** failed to communicate, the **orbiter remains fully operational** in lunar orbit and continues to deliver world-class scientific data.

India Relevance

1. **Scientific Leadership:** Positions India among the few nations contributing original data to global **space-weather research**.
2. **Strategic Implications:** Essential for **designing lunar habitats** – future Indian or international bases must account for CME-induced radiation and dust charging.
3. **Technological Validation:** Confirms India's capability to build **high-sensitivity instruments** capable of long-term autonomous operation around extraterrestrial bodies.
4. **Educational and Diplomatic Value:** Enhances India's participation in collaborative lunar missions such as **Artemis Accords** and **LUPEX (India-Japan)**.

Global Implications

- **Space Weather Forecasting:** The finding refines understanding of how **solar storms affect airless bodies**, improving predictive models for **Mars, Mercury, and asteroids**.
- **Human Habitation Challenges:** Reveals that CMEs can cause **temporary atmospheric swelling** and **radiation surges**, influencing safety protocols for astronauts and robotics.
- **Planetary Science Contribution:** Strengthens the global dataset on **solar-wind-surface interactions**, critical for future **resource extraction** and **radiation-shield design** on the Moon.

Conclusion:

CHACE-2's discovery marks a milestone in **space plasma and lunar science**. It expands ISRO's role from lunar mapping to **space-environment monitoring**, bridging planetary science and human-spaceflight readiness. The event underlines how **India's sustained missions yield global insights**, reinforcing its status as a key player in the next phase of lunar exploration.

An AWS Outage That Brought the Internet to a Halt

Source: Indian Express

UPSC Relevance: GS 3 Science and Technology

Context: Amazon Web Services (AWS)

Why in News?

The October 2025 AWS outage disrupted over 1,000 global services, highlighting the fragility of the Internet due to over-reliance on a few cloud service providers.

Introduction

- Recently, a major outage at **Amazon Web Services (AWS)** — the world's leading cloud computing platform — caused widespread disruption across the Internet, impacting over 1,000 services globally.
- Popular applications such as **WhatsApp, Snapchat, and Reddit**, as well as critical financial and government systems, were rendered temporarily inaccessible.
- This event once again underlined the **growing dependence of the digital economy on a few cloud service providers**, raising concerns about digital resilience, diversification, and the need for global governance mechanisms in cyberspace.

Understanding AWS and Its Role in the Global Internet

- **Amazon Web Services (AWS)** is the world's largest cloud services provider, accounting for about **20% of Amazon's total sales** and **nearly 60% of its operating profit**. It offers a range of services such as:
 - Cloud storage and databases
 - Computing power and analytics
 - Machine learning and application hosting
- These services allow companies, governments, and startups to rent IT infrastructure instead of owning physical servers, thus improving cost efficiency and scalability. However, this also creates a **centralized dependency** — where a disruption in one region of AWS's infrastructure can affect thousands of organizations worldwide.



(Image Source: Indian Express)

The Immediate Cause: DNS Resolution Failure

- According to AWS's status update, the outage originated from its **North Virginia data centre region**, which is a key global hub for Amazon's operations. The root cause was identified as **"DNS resolution issues for the regional DynamoDB service endpoints."**
- **DNS (Domain Name System)** acts as the Internet's address book, translating human-readable web addresses (like *example.com*) into IP addresses used by computers. When the DNS fails, browsers and servers cannot locate websites, resulting in slow responses or complete service inaccessibility.
- In this case, the DNS malfunction affected **DynamoDB**, AWS's **serverless NoSQL database service**, which supports thousands of applications that depend on fast, scalable data storage. As a result, both large-scale and everyday digital operations ground to a halt.

Cloud Centralization and Internet Fragility

- The outage exposes a critical **structural weakness of the modern Internet**—its **over-concentration in the hands of a few providers** such as AWS, Microsoft Azure, and Google Cloud.

- This model offers efficiency and innovation but also **amplifies systemic risk**, where a single point of failure can cripple global connectivity.

Historical Precedents

- In 2024, a **Microsoft Azure disruption** led to global service failures across multiple continents.
- The **CrowdStrike outage** (embedded within Microsoft architecture) caused aviation delays, halted banking operations, and disrupted broadcasting networks globally.
- These incidents demonstrate how the **outsourcing of core infrastructure** to a few tech giants can convert technical glitches into **economic and governance crises**.

Impacts of the 2025 AWS Outage

1. Global Digital Services

- Major social media and communication platforms like **WhatsApp, Reddit, and Snapchat** were inaccessible for several hours, affecting both personal communication and business operations.

2. Financial Systems and E-Governance

- The outage disrupted online services of **financial institutions** such as the **British government's tax portal** and various payment systems, emphasizing how much critical governance now relies on private digital infrastructure.

3. Aviation and Banking in India

- India witnessed significant disruption, especially in **aviation**, with hundreds of flights delayed or cancelled as airline systems failed and staff reverted to manual operations. The **Reserve Bank of India** later reported **minor disruptions** in around ten banks and NBFCs, all of which were

eventually restored.

Broader Implications

1. Digital Sovereignty and Strategic Autonomy

- Reliance on foreign-owned cloud providers exposes countries to **technological vulnerabilities**. The outage strengthens the argument for **domestic cloud infrastructure**, **data localization**, and **public cloud models** to enhance **digital sovereignty**.

2. Cybersecurity and Resilience

- While the incident was not a cyberattack, it underscores the **need for robust redundancy and backup systems**. Governments and companies must adopt **multi-cloud strategies**—distributing workloads across multiple providers to reduce single-point risks.

3. Economic and Governance Risks

- The global economy's digital backbone now runs on private platforms. This raises **policy questions** about regulation, accountability, and the **public interest role of private tech giants**. It also calls for **international cyber norms and standards for critical digital infrastructure**.

4. Emerging Policy Debates

- Should cloud services be treated as **critical infrastructure**, like energy or telecom?
- How can nations balance efficiency from private providers with **strategic control over data**?
- What role should institutions like CERT-In or G20 Digital Economy Working Group play in setting resilience protocols?

Way Forward

- Diversification of Cloud Providers** Governments and corporations should

adopt **hybrid or multi-cloud strategies** to prevent systemic collapse during outages.

- Strengthening Domestic Cloud Ecosystem** Initiatives like **MeghRaj (GI Cloud)** in India and private partnerships under **Digital India** should be scaled to create indigenous capabilities.
- Global Governance of Cloud Infrastructure** There is a pressing need for a **global digital resilience framework**—possibly under the UN or G20—to manage interdependence in cloud computing.
- Enhanced Cybersecurity Standards and Transparency** Cloud providers must be required to **disclose vulnerabilities**, maintain **redundant regional backups**, and adopt **real-time failover systems**.
- Regulatory Oversight** Cloud computing should come under **critical infrastructure protection laws**, ensuring audits, certification, and accountability for outages.

Conclusion:

- The **2025 AWS outage** was not merely a technical failure—it was a **wake-up call for the global digital economy**.
- As the world becomes increasingly interconnected and data-driven, the **fragility of centralized cloud infrastructures** poses a systemic risk to governance, business, and citizens alike.

India Proposes Strict Rules to Label AI Content Amid Growing Deepfake Risks

Source: Reuters

UPSC Relevance: GS 3 Science and Technology, Artificial Intelligence

Context: AI Content

Why in News?

India proposes mandatory labelling of AI-generated content to combat deepfakes, misinformation, and ensure transparency in digital media.

Introduction

- In a significant move towards regulating artificial intelligence (AI) and combating misinformation, the Government of India has proposed new rules mandating that all AI-generated content be clearly labelled.
- The proposal, announced on **October 22, 2025**, seeks to address the growing misuse of generative AI tools such as deepfakes, which have emerged as major threats to social harmony, election integrity, and individual privacy.
- The draft guidelines place India among the few countries—alongside the **European Union and China**—actively pursuing legal frameworks to ensure transparency and accountability in AI deployment.

Background and Rationale

- India, with nearly **one billion internet users**, is one of the largest digital ecosystems in the world. This vast and diverse online space is prone to the rapid spread of **fake news, misinformation, and manipulated content**.
- The rise of AI-generated deepfakes—highly realistic but fabricated videos or images—has intensified these risks, particularly during politically sensitive periods like elections.
- Instances of AI tools being used to impersonate public figures, spread false narratives, or manipulate social media discourse have prompted the government to strengthen oversight

mechanisms.

- Courts in India are already witnessing cases related to **AI misuse**, including a petition filed by Bollywood actors **Abhishek Bachchan and Aishwarya Rai Bachchan** seeking removal of AI-generated videos violating their intellectual property rights.

Key Provisions of the Proposed Rules

- The draft proposal released by the **Ministry of Electronics and Information Technology (MeitY)** introduces several key measures aimed at ensuring **traceability, accountability, and transparency** in AI-generated content:

Mandatory Labelling of AI-Generated Content

- AI-generated visuals, videos, or images must include a **visible label** covering at least **10% of the surface area** of the display.
- For **audio clips**, AI-generated segments must be labelled for at least the **initial 10% of the duration**.
- This labelling ensures users can easily identify synthetic or manipulated content.

User Declarations and Verification

- Social media and content-sharing platforms must obtain a **declaration from users** indicating whether the content uploaded is AI-generated.
- Platforms are required to deploy **technical measures and algorithms** to verify these declarations and prevent misuse.

Metadata Traceability and Transparency

- All AI-generated media must include **metadata markers** to trace the origin and modification history of the content.
- This enables authorities and platforms to track the source of misinformation and

identify responsible entities.

Public Consultation and Compliance Timeline

- The government has invited **public and industry feedback** on the draft proposal by **November 6, 2025**, after which a final version is expected to be notified.
- Once implemented, compliance will be mandatory for global and domestic AI firms operating in India, including **OpenAI, Meta, X (formerly Twitter), and Google**.



(Image Source: reuters.com)

Government's Concerns and Policy Objectives

- The Indian government has emphasized that the **potential misuse of generative AI** to cause harm—such as spreading misinformation, manipulating elections, or impersonating individuals—has grown “significantly.”
- Hence, the proposed regulations aim to:
 - **Protect citizens** from misinformation and identity theft.
 - **Preserve democratic integrity**, especially during elections.
 - **Promote responsible innovation** by ensuring AI is used ethically.
 - **Enhance digital literacy and transparency** in public communication.

Global Context

India's proposal aligns with global efforts to regulate AI transparency:

- The **European Union's AI Act** seeks mandatory disclosures for AI-generated content.
- **China** has already introduced rules requiring clear identification of synthetic media.
- The **United States** is discussing similar initiatives to counter deepfake-related electoral risks.
- By taking early action, India positions itself as a **regulatory leader in AI governance**, balancing innovation with safety and ethics.

Economic and Technological Implications

- India is emerging as a major **market for AI companies**. OpenAI CEO **Sam Altman** revealed in February 2025 that India is the company's **second-largest market by user base**, which has tripled over the past year.
- These regulations, while increasing compliance costs for AI firms, could also:
 - Foster **trust and reliability** in digital platforms.
 - Encourage **ethical AI startups** aligned with transparency norms.
 - Create new opportunities in **AI auditing, content verification, and cybersecurity** sectors.
- However, critics caution that excessive regulation might **slow innovation** or burden small developers unless accompanied by **supportive frameworks** for responsible AI development.

Judicial Dimension: Deepfakes and Legal Accountability

The judiciary's engagement with AI-related disputes reflects growing awareness of digital rights and IP protection. In recent cases, Indian courts have:

- Addressed **intellectual property violations** arising from unauthorized use of AI-generated celebrity likenesses.
- Considered **legal liability** of platforms hosting such content. These developments signal a shift toward **integrated legal-technical governance** of AI systems.

Conclusion:

- India's move to mandate clear labelling of AI-generated content marks a **proactive and necessary step** in safeguarding public trust in the digital information ecosystem. By setting **quantifiable and transparent standards**, the proposal seeks to balance innovation with accountability.

Artificial Intelligence in Healthcare: Moving Beyond Treatment to Prevention

Source: Down To Earth

UPSC Relevance: GS 3 Science and Technology, Artificial Intelligence

Context: Artificial Intelligence in Healthcare

Why in News?

Artificial Intelligence is transforming healthcare from treatment-focused approaches to predictive, preventive, and personalized care, while raising ethical and privacy concerns.

Introduction

- Artificial Intelligence (AI) is transforming the global healthcare landscape — from diagnosis and treatment to disease prevention and health system management.
- With technologies like **machine learning, deep learning, and natural**

language processing, AI is enabling faster diagnosis, personalised treatment, and predictive public health planning.

- However, alongside this transformation, **ethical, privacy, and data bias challenges** persist, demanding a balanced approach between innovation and regulation.

Artificial Intelligence (AI)

Artificial Intelligence (AI) is the **branch of computer science that enables machines to perform tasks that typically require human intelligence**, such as learning, reasoning, problem-solving, perception, language understanding, and decision-making.

Key Features of AI:

1. **Learning:** Ability to acquire knowledge and improve from experience (e.g., Machine Learning).

Reasoning: Ability to analyze situations and draw logical Conclusion:s.

2. **Problem-Solving:** Ability to identify and solve complex problems.
3. **Perception:** Ability to interpret sensory inputs (like vision, speech).
4. **Natural Language Processing (NLP):** Understanding and generating human language.
5. **Autonomy:** Ability to perform tasks without human intervention.

Types of AI:

1. **Narrow AI (Weak AI):** Performs a specific task (e.g., virtual assistants, chatbots).
2. **General AI (Strong AI):** Can perform any intellectual task a human can (still theoretical).
3. **Super AI:** Hypothetical AI surpassing human intelligence.

Applications in India:

- **Healthcare:** Early disease detection, AI-

driven diagnostics, preventive healthcare.

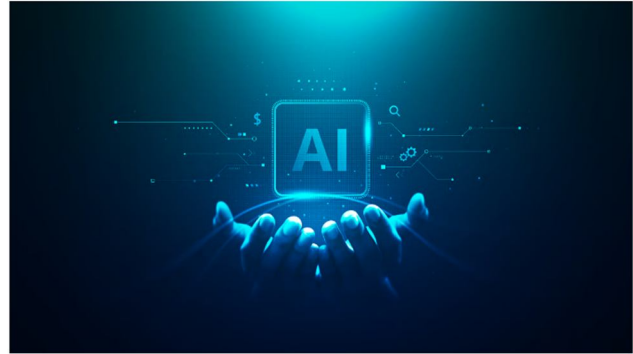
- **Agriculture:** Crop monitoring, predictive analytics, pest detection.
- **Education:** Personalized learning, smart classrooms.
- **Governance:** Predictive policing, citizen grievance management, smart city planning.
- **Finance:** Fraud detection, automated trading, credit scoring.

AI in Healthcare: From Treatment to Prevention

- Traditionally, healthcare systems have focused primarily on treating diseases. However, **AI is shifting this paradigm toward prevention and early intervention** by predicting disease patterns, identifying risks, and promoting proactive care.
- **Predictive Analytics for Prevention:**
 - AI-driven predictive models use vast datasets — including medical records, lifestyle data, and environmental patterns — to forecast disease outbreaks and identify individuals at risk of chronic diseases such as diabetes or heart ailments.
 - *Example:* AI models have successfully forecasted **child malnutrition trends in Kenya** up to six months in advance, enabling timely policy action.
- **Public Health Surveillance:**
 - During the **COVID-19 pandemic**, AI played a pivotal role in tracking infection clusters, forecasting transmission trends, and supporting decision-making through real-time dashboards. These systems continue to be used for **epidemic preparedness and disease**

surveillance.

- **Personalised Preventive Care:**
 - Wearable devices and AI-integrated health apps monitor vital signs and alert users to early signs of illness, thereby promoting a **preventive and participatory model of health management.**



(Image Source: Down To earth)

Applications of AI Across the Healthcare Spectrum

1. Diagnostic Enhancement

- AI technologies significantly reduce diagnosis time through rapid image analysis and pattern recognition.
- **Deep Learning Algorithms** process medical images such as X-rays, MRIs, and CT scans to identify conditions like cancer or fractures with high accuracy.
- **Natural Language Processing (NLP)** tools extract critical information from unstructured clinical notes, improving diagnostic precision.
- Early diagnosis through AI increases the chances of successful treatment and reduces the burden on healthcare infrastructure.

2. Precision Surgery and Robotic Assistance

- AI-powered robotic systems assist surgeons during operations, enhancing precision and minimizing errors.
- These systems enable **smaller incisions, reduced complications, and faster recovery times.**
- **AI-assisted robotic surgery** combines

real-time imaging with machine precision, marking a new era in minimally invasive procedures.

3. Virtual Care and Patient Engagement

- Virtual nursing assistants and AI chatbots are redefining patient interaction.
- They provide **24/7 health guidance**, medication reminders, and preliminary consultations.
- Advanced versions use **speech recognition and sentiment analysis** to assess patient well-being and emotional state.

4. Drug Discovery and Repurposing

- AI has accelerated pharmaceutical innovation by identifying potential compounds faster than traditional methods.
- **IBM Watson** and **Exscientia's AI models** have been instrumental in oncology drug development.
- AI-based molecular modelling and simulation help reduce costs and time in clinical trials.

5. Administrative Efficiency

- Automation tools like **Amazon Transcribe Medical** streamline clinical documentation by converting physician-patient conversations into accurate transcripts. This reduces paperwork and improves efficiency, allowing healthcare professionals to focus more on patient care.

Economic and Operational Impact

- According to **McKinsey & Company**, AI and big data could save up to **\$100 billion annually** in the U.S. healthcare system by optimizing research, clinical trials, and administrative functions. In developing countries like India, where resource constraints limit access to healthcare, **AI-driven telemedicine and remote diagnostics** could democratize

healthcare delivery and expand access to rural areas.

Ethical and Privacy Challenges

Despite its potential, AI in healthcare presents several concerns:

- **Data Bias:** AI models are only as good as the data they are trained on. If training data is skewed toward urban populations or specific ethnic groups, the resulting algorithms may produce **biased outcomes**, worsening healthcare disparities.
- **Privacy and Data Protection:** AI systems rely on large-scale data collection from electronic health records, pharmacy databases, and insurance claims. This raises fears of **data misuse, patient surveillance, and loss of confidentiality**, especially in the absence of strong data protection frameworks.
- **Accountability and Transparency:** AI algorithms often operate as "black boxes," making it difficult to trace decision-making processes. In critical healthcare settings, **lack of explainability** can lead to ethical and legal dilemmas when errors occur.
- **Dependence on Technology:** Overreliance on automated systems may **reduce human oversight** and critical thinking among healthcare providers.

AI for Health Equity and Public Health Strengthening

AI can play a transformative role in **bridging health inequities**:

- **Community-level Data Analysis:** By analyzing behavioral and environmental data, AI can help governments **target awareness campaigns** and address social determinants of health.
- **Resource Allocation:** Predictive analytics can identify regions with healthcare deficits, enabling authorities

to **prioritize infrastructure and resource distribution** effectively.

- **Preventive Policy Formulation:** AI's insights can shape **evidence-based public health policies** that focus on long-term disease prevention rather than short-term crisis response.

Way Forward

- **Ethical Governance:** Governments and regulatory bodies must establish **robust ethical guidelines and AI governance frameworks** to ensure transparency, fairness, and accountability.
- **Data Protection Legislation:** Strengthening data privacy laws such as **India's Digital Personal Data Protection Act (2023)** is crucial to safeguard patient information.
- **Inclusive and Representative Datasets:** AI models should be trained using diverse datasets representing rural, urban, gender, and socio-economic variations to reduce bias.
- **Human-AI Collaboration:** AI should **augment, not replace** human judgment. Medical professionals must be trained to interpret AI outputs critically.
- **Global Cooperation:** Collaboration between nations, tech firms, and public health agencies can accelerate safe and equitable AI deployment in global health systems.

Conclusion:

- Artificial Intelligence is no longer confined to assisting treatment – it is redefining **how societies understand, prevent, and manage health risks**.
- By leveraging AI's predictive and analytical capabilities, healthcare systems can move toward **proactive, preventive, and personalized care**, fostering healthier and more resilient communities.

- However, the success of this transformation depends on ensuring that **ethical integrity, data privacy, and inclusivity** remain at the heart of AI-driven healthcare innovation.

Introducing Artificial Intelligence in School Education

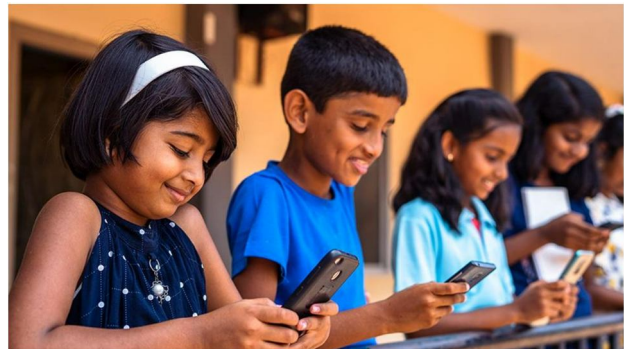
Source: The Hindu

UPSC Relevance: GS 3 Science and technology

Context: Artificial Intelligence in School Education

Why in News?

The Ministry of Education has announced that Artificial Intelligence (AI) will be introduced as part of the school curriculum from Class 3 onwards beginning in the academic year 2026–27, under the government's 'Skilling for AI Readiness' initiative.



(Image Source: The Hindu)

Background

- The Ministry of Education has recently announced that Artificial Intelligence (AI) will be introduced as part of the school curriculum from **Class 3 onwards**, beginning in the **academic year 2026–27**.
- This follows the government's '**Skilling for AI Readiness**' initiative launched in July 2025, under which thousands of **CBSE schools** will start offering AI as a skill subject from **Class 6**.

- The initiative reflects India's vision to build an AI-ready generation capable of understanding, using, and innovating with emerging technologies.
- However, this move has raised important questions about timing, implementation, and impact on education quality, equity, and values.

The Rationale Behind Introducing AI in Schools

AI has become deeply integrated into everyday life – from virtual assistants to personalized learning tools. Introducing AI early can:

- **Foster AI literacy:** Help students understand how AI works, its uses, and its limitations.
- **Develop critical thinking:** Enable students to evaluate AI outputs rather than depend blindly on them.
- **Prepare for future skills:** Equip learners with competencies relevant to the digital economy.
- The curriculum design suggests a progression:
- **In early grades (Class 3-5):** Focus on *AI literacy*, integrated with numeracy, language, and reasoning.
- **In higher grades (Class 11-12):** Move towards *AI skills*, including programming, data handling, and natural language processing, for those interested in STEM careers.

Challenges in Designing an AI Curriculum

While the intent is forward-looking, several challenges make its implementation complex:

- **Rapid technological change:** AI evolves faster than traditional curriculum structures, making content quickly outdated.
- **Infrastructure gaps:** Unequal access to devices, electricity, and internet connectivity in many schools.

- **Digital divide:** Students and teachers in rural or economically weaker areas may lack digital exposure.
- **Language barriers:** Most AI models operate in English, excluding learners from regional-language backgrounds.
- **Uncertain job trends:** The future AI job landscape is fluid, making it difficult to align school-level training with industry needs.
- Without addressing these issues, the introduction of AI could risk widening existing inequalities rather than bridging them.

Impact on Learning and Work Ethic

- AI has immense potential to make learning more personalized and interactive. However, there is growing concern that overreliance on AI tools may weaken students' intrinsic motivation and analytical ability. Studies have shown that when students use AI-generated answers, they often struggle to explain or replicate them independently.
- This raises a deeper concern – that excessive dependence on AI could lead to a phenomenon of “dis-education”, where students lose the drive for original thought and continuous learning. Such trends could undermine creativity and inter-generational knowledge transfer.
- At the same time, history shows that each technological wave – from radio to the Internet – brought similar fears, but education systems eventually adapted. With thoughtful integration and appropriate pedagogy, AI can enhance, not replace, human learning.

Age-Appropriate Introduction and Psychological Concerns

- Children today are already exposed to AI through smartphones, apps, and online platforms. Surveys show that a majority

of students use AI tools as study companions, and many also interact with AI for social or emotional purposes.

- This early exposure calls for **ethical guardrails** to protect children's mental health and data privacy. Chatbots and AI tools must be designed responsibly, ensuring that they do not manipulate or misinform young users. Strengthening laws and platform accountability for child data protection is essential.
- However, it is equally important to ensure that AI tools introduced in classrooms are tested for **accuracy, safety, and bias**, and that teachers are adequately trained to guide their use.

Teacher Training and Systemic Readiness

Teacher preparedness is critical to the success of AI education. Yet, India's schooling ecosystem faces significant challenges:

- Around **9% of schools** operate with only one teacher.
- **35%** have fewer than 50 students and two teachers.
- Nearly **half of teachers** lack professional qualifications.
- Many schools lack electricity or computers.
- Therefore, AI teaching strategies must be **context-sensitive**. In areas with limited resources, "*unplugged curricula*" – that is, teaching AI concepts without digital devices – can help bridge learning gaps.
- Teachers should also receive **continuous training** to develop digital literacy, critical evaluation of AI-generated information, and adaptive teaching methods. They must be viewed as **innovators and facilitators**, not merely implementers.

Building an AI-Ready Generation

The goal of introducing AI in schools is not to make every child a coder, but to nurture skills

and attitudes necessary for an AI-driven world:

- **Critical awareness:** Understanding how AI systems shape information and decisions.
- **Ethical reasoning:** Recognizing bias, fairness, and moral implications.
- **Adaptability:** Embracing lifelong learning in a rapidly changing world.
- **Collaboration:** Learning to work effectively alongside intelligent systems.
- A phased and age-appropriate approach can ensure balanced exposure:
- **Till age 12:** Focus on foundational learning, reasoning, and supervised AI exposure.
- **Middle school (Classes 6–8):** Introduce AI literacy – understanding data, patterns, and responsible use.
- **Secondary stage (Classes 9–12):** Offer AI skill development for students aiming for technology-related careers.

Conclusion:

- Introducing AI into the school curriculum is both timely and necessary for India's long-term educational and economic goals. However, success will depend on **how** it is implemented. A rushed or uniform approach could deepen inequalities, strain unprepared teachers, and weaken core learning outcomes.
- A **phased, inclusive, and ethical framework** – focusing first on AI literacy, teacher capacity-building, infrastructure readiness, and responsible technology use – is essential. AI should complement, not replace, foundational education.

DEFENCE

Konkan-25: Significance of India-UK Carrier Strike Group Maritime Exercise

Source: Indian Express

UPSC Relevance: GS3 Defence

Context: Konkan-25 Exercise

Why in News?

The Indian Navy's carrier strike group and the United Kingdom Royal Navy's Carrier Strike Group (CSG) began their first-ever bilateral exercise Konkan.



(Image Source:

Introduction

- The first-ever bilateral **Carrier Strike Group (CSG)** exercise, Konkan-25, between **India and the United Kingdom**, commenced on **October 5, 2025**, off the western coast of India. It coincides with the **UK Prime Minister Keir Starmer's visit to India**, highlighting the growing defence and strategic cooperation between the two countries.
- **India's Side:** INS Vikrant-led carrier battle group, including MIG-29K jets,

Kamov-31, MH-60R helicopters, and indigenous Advanced Light Helicopters (ALH) and Light Combat Aircraft (LCA-Navy).

- **UK's Side:** HMS Prince of Wales-led CSG, supported by destroyers, frigates, Royal Fleet Auxiliary ships, and operating F-35B aircraft and Merlin/Wildcat helicopters.

Background of Exercise Konkan

- Named after the **Konkan Coast**, the exercise has been **biennial since 2004**.
- **Significance of 2025 Edition:**
- First time **both nations' carrier strike groups are participating together**.
- Marks India's growing capability as a **blue-water navy** alongside the UK.
- **Two Phases of Exercise:**
- **Sea Phase:**
 - Maritime operational drills: **anti-air, anti-surface, anti-submarine warfare**.
 - Flying operations and seamanship exercises.
 - Deployment of frontline naval assets, including carriers, destroyers, frigates, submarines, and air assets.
- **Harbour Phase:**
 - Professional interactions, cross-deck visits, sports, and cultural engagements.
 - **Joint Working Group meetings and Subject Matter Expert Exchanges**.

Strategic and Defence Significance

A. Enhancing Interoperability

- The exercise strengthens **joint operational readiness** between the two

navies.

- **Technology sharing and best practices:** Both carriers' operations allow sharing of **carrier-based air operations and multi-domain combat tactics**.

B. Indo-Pacific Focus

- The Indo-Pacific is **strategically vital for global trade and security**, witnessing rising **geopolitical tensions**.
- By conducting **joint CSG operations**, India and the UK project **maritime power, deterrence, and freedom of navigation** in international waters.

C. Commitment to Rules-Based Maritime Order

- Both nations reaffirm a **free and open Indo-Pacific**, emphasizing adherence to **international maritime law**.
- Strengthens regional security architecture under **India's Indo-Pacific Oceans Initiative (IPOI)**.

D. Blue-Water Capability Demonstration

- Both navies are **multi-carrier, blue-water capable**, placing them in an **exclusive club of maritime powers**.
- Enables **long-duration, high-seas operations**, showcasing **India's growing indigenous naval capabilities**, especially with **INS Vikrant**.

Part of India-UK Vision 2035

- Konkan-25 aligns with **India-UK Vision 2035**, emphasizing **defence and security cooperation**.
- Key Objectives:
 - **Maritime Security Centre of Excellence (RMSCE):** Capacity-building for non-traditional maritime threats in the Indian Ocean.
 - **Military Interoperability:** Exchange of training, joint exercises, and

positioning of instructors in each other's institutions.

- **India as Logistics Hub:** Sustaining UK forces' presence in the Indian Ocean Region.

Analytical Significance for UPSC Perspective

A. Bilateral Relations

- Exercise strengthens **India-UK strategic partnership**, expanding beyond trade to **security and defence**.
- Diplomatic signaling: Coordination amid **regional tensions in Indo-Pacific**, particularly with China's maritime assertiveness.

B. Security and Geopolitics

- Enhances **deterrence and operational readiness** of the Indian Navy.
- Reflects India's **multi-alignment foreign policy**, collaborating with **Western powers without compromising strategic autonomy**.

C. Defence Modernisation

- Highlights **Indigenisation of Defence:** **INS Vikrant** as a symbol of India's **self-reliance in naval aviation and shipbuilding**.
- Promotes **joint learning in advanced CSG operations**, benefiting **tactical, operational, and strategic capabilities**.

D. Implications for Regional Maritime Security

- Supports **free trade and safe sea lanes** in the Indian Ocean Region (IOR).
- Contributes to **maritime domain awareness** and readiness against **non-traditional threats** such as piracy, trafficking, and natural disasters.

Conclusion:

- Konkan-25 marks a **historic milestone in India-UK maritime cooperation** by

combining both nations' carrier strike groups. Beyond operational drills, it is a strategic statement of partnership, regional security, and blue-water capabilities.

IAF to Finally Receive First Tejas Mk1A Fighter Jet Amid Ongoing Fleet Shortage

Source: The Hindu

UPSC Relevance: GS3 Defence

Context: Tejas Mk1A Fighter

Why in News?

The Indian Air Force (IAF) is set to induct the Tejas Mk1A, marking a milestone in India's indigenous fighter aircraft development under the LCA programme.

Introduction

- Indian Air Force (IAF) is set to receive its first **Light Combat Aircraft (LCA) Tejas Mk1A** in October 2025, marking a significant milestone in India's **indigenous fighter aircraft development programme**.
- This comes amid ongoing efforts to bridge the IAF's depleted fighter squadron strength and strengthen domestic defence production capabilities.

Tejas Mk1A: Features and Significance

Indigenous Development:

- Developed by **Hindustan Aeronautics Limited (HAL)** under the **Light Combat Aircraft (LCA) programme**, Tejas represents India's push for self-reliance in defence manufacturing.

Upgrades over Mk1:

- The **Mk1A variant** features **enhanced avionics, improved weapons systems,**

AESA radar, electronic warfare suites, and reduced maintenance requirements, compared to the initial Mk1 version.

- It is a **multi-role, lightweight fighter**, capable of air-to-air combat, ground attack, and reconnaissance missions.

Production and Delivery:

- HAL's contract is for **83 Mk1A aircraft**, originally scheduled to begin in February 2024.
- Delays have occurred primarily due to **slow engine deliveries from GE Aerospace**, with only **1-2 engines supplied per month**.
- HAL now targets **completing deliveries within four years**, assuming no further setbacks.

First Flight and Public Display:

- Defence Minister **Rajnath Singh** is scheduled to witness the **first flight in Nashik on October 17, 2025**, signalling the operational induction of the Mk1A.



(Image Source: The Hindu)

IAF Fighter Strength and Operational Needs

Current Squadron Strength:

- The IAF currently operates **29 squadrons**, below the sanctioned **42 squadrons**.
- Decommissioning of **MiG-21 squadrons** and delays in replenishment have widened the capability gap.
- Annual Production Requirement:**

- To maintain operational readiness, the IAF requires **two squadrons per year (30–40 aircraft)**.
- Indigenous production of Tejas Mk1A contributes to reducing dependency on imported aircraft.
- **Future Acquisitions:**
 - The IAF's **Multi-Role Fighter Aircraft (MRFA) proposal** is under consideration.
 - Plans include procurement of **"Made in India" Rafale jets**, with **18 expected to be delivered off-the-shelf** in the near term.
 - Dassault Aviation currently has **233 Rafales still in production globally**, with output at four aircraft per month.

Advanced Indigenous Projects

- **Advanced Medium Combat Aircraft (AMCA):**
- India's **first indigenous fifth-generation stealth fighter**, aimed at enhancing air superiority.
- **Flight expected within this decade**, with operational induction by **2035**.
- Will incorporate **stealth technology, advanced avionics, and next-gen weapons systems**.
- **Long-Term Fighter Requirement:**
- Defence analysts estimate India will need **200–250 additional fighters** and parallel **indigenous production lines** to ensure long-term operational readiness and strategic autonomy.

Strategic and Defence Implications

- **Indigenisation and Atmanirbhar Bharat:**
- The Tejas Mk1A programme exemplifies India's commitment to **defence self-reliance**, reducing dependency on foreign suppliers.

- **Operational Readiness:**
- Increasing the number of squadrons with **Mk1A and future AMCA aircraft** addresses gaps created by **aging fleets and decommissioned aircraft**, ensuring **air defence preparedness**.
- **Economic and Technological Impact:**
- Indigenous fighter production supports **high-technology manufacturing, job creation, and skill development**.
- Enables India to **export fighter aircraft and defence technology** in the long term, strengthening geopolitical influence.

Conclusion:

- The induction of **Tejas Mk1A** marks a **turning point in India's aerospace and defence journey**, balancing immediate operational needs with long-term self-reliance objectives.

Defence: India–Australia Sign Key Defence Agreements

Source: The Hindu

UPSC Relevance: GS 3-Defence

Context: India–Australia Key Defence Agreements

Why in News?

India and Australia signed key defence agreements in October 2025 to deepen cooperation across maritime, air, land, and defence industrial domains, reinforcing their strategic partnership in the Indo-Pacific.

Introduction

- A team India and Australia signed a series of key defence agreements in Canberra during the **inaugural Australia–India Defence Ministers' Dialogue**, co-chaired by **India's Defence**

Minister Rajnath Singh and Australia's Deputy Prime Minister and Defence Minister Richard Marles.

- The meeting marked **five years of the India-Australia Comprehensive Strategic Partnership** and represents a major step forward in the countries' evolving security cooperation in the Indo-Pacific region.

Background and Strategic Context

- India and Australia, as two major Indo-Pacific democracies, have steadily deepened their bilateral and multilateral engagements amid shifting regional dynamics. Their cooperation aligns with a shared commitment to maintaining a **free, open, inclusive, and rules-based Indo-Pacific**, underpinned by respect for **international law and freedom of navigation**, as enshrined in **UNCLOS** (United Nations Convention on the Law of the Sea).
- The dialogue reflects **growing strategic convergence** between the two nations in response to increasing maritime challenges, technological disruptions, and regional security uncertainties.

Key Agreements Signed

The 2025 Defence Ministers' Dialogue concluded with the signing of **three major agreements**:

- **(a) Agreement on Information Sharing:** Enhances real-time exchange of intelligence and operational data to support coordinated defence activities and maritime domain awareness.
- **(b) MoU on Submarine Search and Rescue Cooperation:** Establishes a framework for mutual support in submarine rescue operations. This builds upon the **Implementing Arrangement on Mutual Submarine Rescue Support**

and Cooperation, marking a significant advancement in undersea domain collaboration.

- **(c) Terms of Reference for Joint Staff Talks:** Sets up structured mechanisms for regular consultations between the armed forces, improving interoperability and strategic coordination.



(Image Source: The Hindu)

Maritime and Air Cooperation

- Both nations reaffirmed the centrality of **maritime security** to regional stability. The two sides discussed a **Joint Maritime Security Collaboration Roadmap**, aimed at enhancing:
 - Maritime domain awareness (MDA)
 - Operational interoperability between navies
 - Joint exercises and information exchange
- Australia also invited India to participate in its **submarine rescue exercise "Black Carillon"**, while India welcomed Australia's participation in bilateral and multilateral military exercises such as:
 - Talisman Sabre
 - Austrahind
 - Puk Puk
- In the air domain, the dialogue reviewed progress on **operationalising the Air-to-Air Refuelling Agreement** signed in 2024, which enhances logistical cooperation between the Indian Air Force and the Royal Australian Air Force.

Defence Industry and Technological Collaboration

- Recognising the importance of **defence industrial cooperation**, the ministers announced:
- **Australia's first Defence Trade Mission to India (7-10 October 2025)**
- The upcoming **Australia-India Defence Industry Roundtable** in Sydney
- Under the **Joint Working Group on Defence Industry, Research and Materiel**, both countries reaffirmed cooperation in:
 - Artificial Intelligence (AI)
 - Unmanned systems
 - Secure communications
 - Defence innovation and start-ups
- Australia also appreciated India's offer to provide **maintenance and repair facilities** for Royal Australian Navy ships in Indian shipyards – an example of "Make in India, Make for the World" in defence manufacturing.

Human Resource and Educational Cooperation

- Personnel exchanges and training are set to deepen:
- More **Indian officers will join the Australian Defence College** in 2026.
- A new slot at the **Australian Defence Force Academy** will open for Indian students in 2027.
- These initiatives strengthen **people-to-people defence linkages**, fostering long-term institutional trust and operational understanding between the two militaries.

Multilateral and Regional Engagement

The dialogue reaffirmed India and Australia's shared vision for a **stable Indo-Pacific** through:

- **The Quad (India, Australia, Japan,**

United States)

- **The Australia-India-Indonesia Trilateral Cooperation**
- Both sides emphasized adherence to **international law**, freedom of navigation, and peaceful resolution of disputes – aligning with their broader Indo-Pacific strategic frameworks.

AUSTRAHIND Exercise

- The 3rd edition of **Exercise AUSTRAHIND** (Nov 2024, Maharashtra) enhances **India-Australia military cooperation** and interoperability, focusing on **counterterrorism, tactical drills, and joint planning**.
- Conducted in **two phases**, it reflects the **Comprehensive Strategic Partnership (2020)**.
- Other exercises include **AUSINDEX** and **PITCHBLACK**.
- Cooperation is supported by the **Mutual Logistics Support Agreement**, and both nations participate in **Quad, IORA, ASEAN Regional Forum**, and **East Asia Summits**.

Significance

- **Strategic Convergence:** The agreements indicate a maturing of India-Australia ties from transactional cooperation to a **comprehensive strategic partnership**, with greater emphasis on interoperability, joint research, and industrial integration.
- **Maritime Security Focus:** Given Australia's Pacific presence and India's Indian Ocean role, their collaboration enhances **Indo-Pacific maritime stability**, particularly in the face of expanding regional naval activities.
- **Defence Industrial Synergy:** Industrial collaboration reflects mutual interest in

building resilient **supply chains**, reducing dependency on third countries, and promoting indigenous capabilities.

- **Technology and Training Integration:** Focus on AI, unmanned systems, and training cooperation signals a move toward **next-generation defence preparedness** and knowledge sharing.
- **Regional Balancing:** By strengthening bilateral and multilateral defence engagement, the two nations contribute to a **balanced regional security architecture**, reinforcing the Indo-Pacific's "rules-based order."

Conclusion:

- The **2025 India-Australia Defence Ministers' Dialogue** signifies a new era of **strategic trust and operational cooperation**.

India-U.K. Strategic Missile Deal and Major Investment Commitments

Source: The Hindu

UPSC Relevance: GS 3 Defence

Context: India-U.K. Strategic Missile Deal

Why in News?

INDIA AND THE U.K. SIGNED A £350-MILLION MISSILE DEAL, ADVANCED NAVAL ELECTRIC ENGINE COLLABORATION, AND SECURED £1.3 BILLION IN INDIAN INVESTMENTS IN THE U.K.

Introduction

- The India and the United Kingdom have taken a significant step forward in their strategic and economic partnership through a series of high-value agreements signed during British Prime Minister **Keir Starmer's visit to India** on October 9, 2025.

- The visit, marked by a meeting between Prime Minister Narendra Modi and Mr. Starmer at Raj Bhavan, Mumbai, witnessed the Conclusion: of key defence and investment deals aimed at strengthening bilateral ties under the emerging framework of India-U.K. Comprehensive Strategic Partnership.



(Image Source: The Hindu)

Defence Cooperation: £350-Million Missile Deal

- **Core Agreement:** India signed a **£350-million deal** with the U.K. to acquire **Lightweight Multirole Missiles (LMM)**, manufactured in Belfast, for the Indian Army.
- **Strategic Significance:** This contract marks a major development in India's efforts to **modernize its defence arsenal** and diversify its sources of advanced military technology. For the U.K., it aligns with its "**Plan for Change**," reinforcing the country's post-Brexit ambition to strengthen defence exports and establish global industrial partnerships.
- **Broader Implications:** The missile purchase serves as a **gateway to a wider "complex weapons partnership"** currently under negotiation. Such collaboration may encompass **co-development and co-production** of advanced systems, aligning with India's *Make in India* and *Atmanirbhar Bharat* initiatives.

initiatives while bolstering the U.K.'s defence manufacturing sector.

Naval Collaboration: Electric Engines Initiative

- **New Frontier in Green Defence:**
 - Alongside the missile deal, both sides agreed to advance cooperation in **electric-powered naval engines**, under an **Implementing Arrangement worth £250 million**.
 - This reflects a shared commitment to **sustainable defence innovation**, with electric propulsion expected to reduce emissions and improve stealth in future naval fleets.
- The collaboration also positions India as a participant in **next-generation naval technology**, complementing its growing maritime ambitions under the *Sagarmala* and *Maritime India Vision 2030* initiatives.

Economic and Investment Engagement

- **Indian Investments in the U.K.**
 - A total of **64 Indian firms** have committed to invest **£1.3 billion (₹15,430 crore)** in the U.K., signalling deepening commercial confidence between the two economies.
 - These investments are expected to create **nearly 7,000 new jobs** across the U.K., primarily in sectors such as **engineering, technology, and creative industries**.
- **Major Announcements:**
 - **TVS Motor Company:** £250 million investment in Solihull to expand *Norton Motorcycles* operations and develop electric vehicles.
 - **Cyient Ltd.:** £100 million investment in semiconductors, geospatial technology, clean energy, and digital innovation, creating 300 jobs.
 - **Muthoot Finance UK Ltd.:** £100

million to expand its financial network to 20 branches across the U.K.

- **Hero Motors:** £100 million over five years in *e-mobility, e-bicycles, and aerospace sectors*.
- This surge in Indian investments underscores India's **emergence as a global investor**, with its private sector actively expanding into international markets.
- For the U.K., it supports regional growth post-Brexit and diversifies foreign investment sources beyond Europe.

Educational and Innovation Partnerships

- The **University of Lancaster** and **University of Surrey** have been granted approval to establish **campuses in India**, marking a landmark development in educational cooperation.
- **Imperial College London** has partnered with **Science Gallery Bengaluru** to foster **research and innovation linkages**, deepening the *knowledge diplomacy* dimension of bilateral relations.
- **Significance:**
 - This academic engagement caters to India's booming demand for higher education and enhances the U.K.'s academic presence in the Indo-Pacific. It also promotes **cross-border mobility of talent, research collaboration, and skill development** — key pillars in both countries' innovation ecosystems.

Trade and Investment Symmetry: Missing Data on U.K. Investments

- While the U.K. government highlighted Indian investment inflows, similar data on **U.K. investments into India** remains undisclosed by the Indian Ministry of Commerce and Industry.

- However, statements from **Rolls-Royce CEO Tufan Erginbilgic** indicating ambitions to “develop India as a home for Rolls-Royce” point to the likelihood of future industrial collaboration, particularly in **aerospace and marine engineering** sectors.

Recent Developments in India-UK Defence Ties

- **Defence Partnership – India (DP-I):**
 - India and the U.K. have launched the **Defence Partnership-India (DP-I)**, aimed at strengthening and streamlining bilateral defence collaboration across technology, manufacturing, and strategic operations.
- **Defence Manufacturing Collaboration:**
 - The two countries have signed contracts to supply **Laser Beam Riding MANPADs (LBRM)**, starting with the initial delivery of **High Velocity Missiles (STARStreak)** and associated launchers.
 - Additionally, both nations will jointly produce **Lightweight Multirole Missiles (LMMs)**, integrating Indian industries into the U.K.’s global defence supply chain.
 - India will also host its first **Advanced Short-Range Air-to-Air Missile (ASRAAM)** assembly and testing facility in Hyderabad, supporting fighter jet modernization and potential global exports.
- **Electric Propulsion Systems:**
 - India and the U.K. have agreed to develop an **Integrated Full Electric Propulsion (IFEP)** system for India’s next-generation **Landing Platform Dock (LPD)** fleet, with an expected delivery timeline by 2030.
 - This marks a step toward

modernising India’s naval capabilities with sustainable and advanced technologies.

How the U.K. Can Strengthen India’s Defence

- **Access to Advanced Technologies:** Under the **India-UK 2030 Roadmap**, the U.K. is providing critical technologies such as **jet engine development** and **electric propulsion systems**, enabling India to co-develop next-generation defence capabilities.
- **Promoting Self-Reliance:** These collaborations align with India’s ‘**Make in India, Make for the World**’ initiative, enhancing indigenous production while integrating global standards and expertise.
- **Strategic Military Presence:** The partnership includes the establishment of a **Littoral Response Group** in the Indian Ocean for joint exercises, leveraging bases in **Oman, Nepal, Brunei, Diego Garcia, and Singapore**, thereby strengthening India’s maritime security and strategic reach.

Strategic Context: Beyond Bilateralism

- The current round of agreements fits within the broader framework of **India-U.K. strategic alignment** across defence, economy, climate, and education.
- It also complements ongoing discussions on the **India-U.K. Free Trade Agreement (FTA)**, which, once concluded, could further liberalize trade and strengthen the Indo-Pacific partnership.
- **Defence Dimension:** These deals reinforce India’s diversification away from traditional suppliers, expanding its **defence diplomacy** with democratic partners.

Economic Dimension:

- The reciprocal flow of investments signifies a **maturing economic interdependence** between the two nations.
- **Education and Innovation:** The institutional presence of U.K. universities in India represents a **soft power bridge**, enhancing human capital cooperation.

Conclusion:

- The £350-million missile deal and the accompanying economic and educational agreements signal a **comprehensive deepening of India-U.K. relations**.

For a New Path: On the Surrender of Key Maoist Leaders

Source: The Hindu

UPSC Relevance: GS Paper 3 - Internal Security (Left-Wing Extremism) | GS Paper 2 - Governance, Welfare, Federal Issues

Context: Counter-Insurgency, Governance

Why in News

The recent surrender of senior Maoist leaders, including former Politburo member, signifies a gradual ideological and operational collapse of Maoist strongholds across central India – once considered the insurgency's core zone.



(Image Source: The Wire)

Downfall of Maoism in India – Causes and Context

1. Strategic Contraction and Loss of Territorial Control

- Maoist presence has reduced from over **90 districts a decade ago to just 11**, with effective control limited to **Bijapur, Narayanpur, and Sukma** in Chhattisgarh.
- Continuous **security operations**, better intelligence coordination, and **denial of safe zones** eroded the insurgents' operational depth.

2. Shift in State Strategy: From Repression to Development

- The earlier **militarised approach** (e.g., **Salwa Judum**) created resentment and displacement; its Supreme Court ban in 2011 marked a policy reset.
- Post-2011, governments adopted a **"Clear-Hold-Develop"** model, combining police presence with **roads, schools, health centres, and PDS access**.
- This gradually **restored the legitimacy of the state** among tribal communities who had long felt abandoned.

3. Decline of Ideological Appeal among Tribals

- Tribals realised that Maoists' emphasis on **armed struggle** brought continued violence but **no socio-economic progress**.
- Disillusionment grew as Maoists taxed local produce, interfered in village life, and obstructed welfare schemes.
- State-led initiatives in land titles (FRA), MGNREGS, and tribal cooperatives offered **tangible gains**, eroding Maoist credibility.

4. Professionalisation of Security Forces

- Counter-insurgency units such as **CRPF's CoBRA, Greyhounds**, and state police **Special Task Forces** adapted to jungle warfare and improved local

intelligence.

- Use of **drones, communication grids, and coordinated multi-state operations** limited Maoist mobility and recruitment.

5. Ideological Exhaustion and Leadership Fatigue

- Senior leaders like *Mallojula Venugopal Rao* have acknowledged that the **Chinese and Russian revolutionary models** are irrelevant to modern India.
- The Maoist cadre is aging; recruitment from youth and tribal groups has sharply declined due to **loss of purpose and hope**.

6. Growing Political and Social Integration

- Enhanced **panchayati raj participation**, youth employment programs, and improved infrastructure have drawn local populations closer to **mainstream governance**.
- The absence of large-scale human rights violations in recent years has built trust, replacing fear with cooperation.

India Relevance

1. **Stability Dividend:** The decline of LWE opens avenues for **inclusive development and state-building** in long-neglected tribal regions.
2. **Governance Lesson:** Demonstrates the efficacy of a **"security + development" approach**, blending law enforcement with local participation.
3. **Democratic Assimilation:** Reintegration of former insurgents through **surrender and rehabilitation policies** aligns with India's constitutional ethos.
4. **Economic Impact:** Boosts confidence for **investments in mineral-rich tribal districts**, improving local employment and connectivity.
5. **National Integration:** Sets the stage for transforming conflict-ridden belts into

productive democratic spaces — similar to Mizoram and Tripura post-insurgency transitions.

Global Parallels

- Experiences in **Peru (Shining Path), Colombia (FARC), and Philippines (NPA)** show that sustainable peace requires **political dialogue, amnesty frameworks, and grassroots development**, not just military victory.
- India's model now mirrors these global de-escalations, with emphasis on **human security and reconciliation**.

Conclusion:

The surrender of top Maoist leaders represents not just the weakening of a militant movement but the renewal of democratic opportunity. If accompanied by institutional reforms, tribal inclusion, and justice, this could finally close one of India's longest internal conflicts — allowing affected regions to chart a new developmental path under the rule of law.

Online Radicalisation and the Emergence of Female Terrorist Networks

Source: New Indian Express

UPSC Relevance: GS3 Security

Context: Cyber-jihad and transnational terrorism.

Why in News?

Pakistan-based Jaish-e-Mohammed has launched an online course *Tufat al-Muminat* to recruit and radicalise women into its newly formed female brigade.

Introduction

- Recently, intelligence agencies flagged that Pakistan-based Jaish-e-Mohammed

(JeM) is launching an online course, *Tufat al-Muminat*, to recruit and radicalise women into a newly announced female wing, Jamaat-ul-Muminat.

- The course is scheduled to begin in November 2025 and will be led by relatives of senior JeM leaders, including Masood Azhar's sisters. A nominal donation is collected from enrollees, which also serves as a fundraising channel for the organisation.
- This move reflects a strategic shift in terrorist recruitment, leveraging online platforms and gendered mobilisation.



(Image Source: Hindustan Times)

Strategic Significance

- **Low-cost expansion:** Online recruitment overcomes geographic and logistical barriers, allowing rapid scaling.
- **Diversification of cadre:** Inclusion of women widens operational possibilities, including fundraising, logistics, communications, and potentially active roles in attacks.
- **Fundraising avenue:** Small enrolment fees and donations contribute to sustained funding for the organisation.

Online Indoctrination

- **Mechanisms:** The course uses structured pedagogy, live lectures, registration forms to collect personal data, and community-building in closed online groups.

- **Narrative framing:** Combines theological teachings with identity-based grievance narratives, converting sympathy into obligation.
- **Vulnerabilities exploited:** Social media algorithms, encrypted communications, and donation gateways make detection difficult.

Cyber-Jihad

- **Digital battlefield:** Recruitment, propaganda, fundraising, operational coordination, and intelligence gathering are increasingly online.
- **Implications for security:** Counter-terrorism now requires cyber-surveillance, platform cooperation, and monitoring of financial transactions alongside traditional methods.

Emergence of Female Terrorist Groups

- Globally, militant groups such as LTTE, ISIS, and Hamas have mobilised women for symbolic, logistical, and operational roles.
- **Advantages for terrorists:** Women often evade suspicion, create propaganda value, and expand the recruitment base.
- **Tactical necessity:** Expanding to female recruits compensates for pressure on male cadres or operational losses.

Psychological Dimension

- **Tactics used:** Identity reframing, moral disengagement through gradual exposure, and social/emotional manipulation.
- **Countermeasures:** Credible counter-narratives, psychosocial interventions, family engagement, and school-based resilience programs reduce susceptibility to online radicalisation.

Security Implementations and Preparedness

A. Intelligence & Detection

- Monitor open-source content, enrolment data, and payment flows.
- Share actionable intelligence among domestic and international agencies.

B. Legal & Financial Measures

- Track micro-donations and enforce KYC norms for online payments.
- Hold platforms accountable for extremist content and require takedown mechanisms.

C. Platform & Technology Responses

- Combine takedown operations with ongoing monitoring to prevent displacement to other platforms.
- Fund credible local counter-messaging campaigns targeting vulnerable populations.

D. Community Resilience

- Promote digital literacy, early detection of grooming, and school/community counseling.
- Engage women leaders, survivors, and NGOs to create gender-sensitive counter-narratives.

E. Gender-Sensitive Rehabilitation

- Offer safe shelters, counseling, and reintegration programs for women exiting extremist groups.

Strategic Implications for India

- **Early warning:** Digital enrolment and donations provide potential leads for intelligence.
- **Transnational cooperation:** Close coordination with neighbouring states and international platforms to disrupt recruitment and funding networks.
- **Legal readiness:** Strengthen cyber laws, counter-terrorism frameworks, and

technical capacity to act swiftly.

Conclusion:

- JeM's *Tufat al-Muminat* represents a new front in online female radicalisation and cyber-jihad.
- Addressing this threat requires a **multi-pronged strategy**: disruption of online networks, denial of funds, credible counter-narratives, community engagement, gender-sensitive rehabilitation, and international cooperation.
- Balancing civil liberties with security imperatives is critical to prevent the spread of extremism while protecting democratic rights.

INS Ikshak: Strengthening India's Maritime Self-Reliance and Inclusivity

Source: India Today

UPSC Relevance: GS 3 Defence

Context: INS Ikshak,

Why in News?

INS *Ikshak*, the third indigenously built Survey Vessel (Large) of the Indian Navy with over 80% indigenous content and women-specific accommodation, will be commissioned on November 6, 2025, at Kochi.



(Image Source: India Today)

Introduction

- The Indian Navy is set to commission **INS Ikshak**, the third vessel in the **Survey Vessel (Large) [SVL]** class, on **November 6, 2025**, at the Naval Base in Kochi. The commissioning ceremony will be presided over by **Admiral Dinesh K. Tripathi**, Chief of the Naval Staff.
- This milestone marks a significant advancement in India's pursuit of **self-reliance in naval shipbuilding** and its broader goal under the **Aatmanirbhar Bharat initiative**.

A Major Leap Toward Indigenous Naval Capability

- INS Ikshak has been **constructed by Garden Reach Shipbuilders & Engineers (GRSE) Ltd, Kolkata**, under the supervision of the Directorate of Ship Production and the Warship Overseeing Team (Kolkata).
- The ship stands as a testament to India's growing expertise in indigenous shipbuilding, boasting **over 80% indigenous content**.
- This achievement showcases the **successful collaboration between the Indian Navy, GRSE, and numerous MSMEs**, reinforcing the domestic industrial base's capability to deliver technologically advanced and complex maritime platforms.
- The project not only enhances India's hydrographic capacity but also strengthens the nation's defense manufacturing ecosystem.

Dual-Role Functionality: Strategic and Humanitarian Utility

- INS Ikshak is designed with **dual-role capability**, making it more than just a

hydrographic survey vessel.

- While its primary mission is to **conduct hydrographic surveys**—critical for charting maritime boundaries, ensuring safe navigation, and supporting naval operations—it can also be swiftly converted into a **Humanitarian Assistance and Disaster Relief (HADR) platform** or a **hospital ship** during emergencies.
- This versatile design enables the vessel to play a pivotal role in both **strategic defense operations and humanitarian missions**, thereby enhancing the Navy's operational flexibility and responsiveness in times of crisis.

Promoting Inclusivity in Naval Design

- In a significant step towards gender inclusion, **Ikshak is the first ship in the SVL class to feature dedicated accommodation for women officers and sailors**.
- This inclusion reflects the Indian Navy's **progressive approach** towards building a **modern, gender-integrated force**.
- By incorporating women-specific facilities, the Navy reaffirms its commitment to inclusivity, aligning with broader national efforts to ensure greater participation of women in all sectors of defense and public service.

Symbolism and Significance of the Name

- The name *Ikshak*—which means **"The Guide"**—beautifully captures the vessel's core mission and spirit. As a survey ship, its primary role is to **guide mariners through uncharted waters**, contributing to **safe navigation and maritime domain awareness**.
- The ship embodies the Navy's vision of being a **"guide" to India's waters**, symbolizing safety, precision, and

exploration.

Enhancing India's Hydrographic and Maritime Strength

- With its commissioning, INS Ikshak will significantly **enhance India's hydrographic survey capabilities**, ensuring accurate charting of coastal and deep-sea regions.
- This improvement directly contributes to **regional maritime safety**, supports **blue economy initiatives**, and strengthens India's role in **maritime cooperation and navigation safety** across the Indo-Pacific region.
-

The induction of Ikshak reflects a broader vision of the Indian Navy—to build a **future-ready, self-reliant, and inclusive fleet** that upholds India's maritime interests and contributes to regional peace and security.

Conclusion:

- INS Ikshak represents more than a technological achievement—it embodies India's **commitment to self-reliance, inclusivity, and maritime excellence**. By guiding the nation's maritime journey toward a safer and more self-reliant future, **INS Ikshak truly lives up to its name—"The Guide."**



PUBLIC HEALTH

India: The Rising Burden of Non-Communicable Diseases

Source: New Indian Express

UPSC Relevance: GS1 Public Health

Context: Anshakalin Stri Parichars

Why in News?

Women community health workers like Anshakalin Stri Parichars (ASPs) in Maharashtra perform essential rural health services but remain underpaid, unprotected, and unrecognised,



(Image Source: Business Northeast)

Introduction

- The case of **Anshakalin Stri Parichars (ASPs)** in Maharashtra reflects a long-standing challenge in India's public health system — the persistent undervaluation of women's labour in rural health care.
- For decades, ASPs have shouldered a **wide breadth of responsibilities** such as supporting maternal and child health services, immunisation drives, disease surveillance, and hospital upkeep in rural areas.

- Yet, despite their indispensable role, their **monthly wage has stagnated at ₹3,000 since 2016**, leaving them decades behind inflation and far below the living wage standard.

Gendered and Caste-Inflected Hierarchy in Health Labour

- The plight of ASPs reveals a **gendered and caste-inflected hierarchy of labour** in public health. These women — mostly **poor and rural** — are often overlooked in wage policies and denied basic entitlements like job security, pensions, travel allowance, and safety gear.
- Their marginalisation is not accidental but systemic:
- The State promised a **meagre ₹6,000 per month by December 2025**, far below what multi-purpose health workers earn.
- In **2023**, the **Nagpur labour court acknowledged** that ASPs deserve at least the protection of the **Minimum Wages Act**, but left its implementation to the State, resulting in continued delays.
- This neglect stems from the perception that such care work, performed by rural women, is of **"low status"** despite being **skilled and essential**, thereby legitimising their exploitation.

Parallels with ASHA Workers and Other Grassroots Health Providers

- ASPs' struggle mirrors the **ongoing protests of Accredited Social Health Activists (ASHAs)** across States.
- Introduced under the **National Rural Health Mission (2005)** as the first link

between communities and the formal health system, **ASHAs are still classified as “volunteers” rather than employees.**

- They are compensated mainly through **incentives that are often delayed and insufficient for subsistence.**
- Like ASPs, ASHAs have consistently demanded **fixed honoraria, recognition as government staff, and social security benefits.**
- Both groups illustrate how **India’s rural health infrastructure is built on the underpaid labour of women**, whose contribution remains unrecognised by the system that depends heavily on them.

Structural Contradictions in Rural Health Care

- India’s reliance on women community health workers is often framed as offering **“opportunities” for rural women**, yet it has translated into **systemic exploitation.**
- ASPs face **unsafe working conditions**, such as **risking snakebites while clearing hospital grounds or death in road accidents while travelling for vaccination duty**, often without insurance or compensation.
- These conditions highlight how **public health delivery at the grassroots remains insecure and unsustainable** when it fails to value the very workers who keep it functional.
- A **health system that disregards the welfare of its frontline workers undermines itself**, as it weakens the link between rural populations and formal care services.

Way Forward

To ensure equitable and effective rural health care, policy must prioritise the **rights and**

welfare of women community health workers:

- **Living Wages and Fixed Honoraria:** Immediate revision of wages in line with **Minimum Wages Act provisions**, along with timely disbursement.
- **Safe and Dignified Working Conditions:** Provision of **safety gear, travel allowances, and insurance cover** for occupational hazards.
- **Recognition as Government Staff:** Granting **job security, pensions, and social security benefits** to community health workers to legitimise their role in the health workforce.
- **Gender-Responsive Health Governance:** Integrating women’s voices into decision-making processes to counter structural discrimination.

Conclusion:

- A truly **resilient rural health system cannot be built on the unpaid or underpaid labour of women.** Securing their economic and social rights is essential not just for justice but also for the long-term sustainability of rural health care delivery.

Overindulgence in Carbohydrates and Low Protein Intake: Drivers of India’s Obesity Crisis

Source: Indian Express

UPSC Relevance: GS2 Public Health

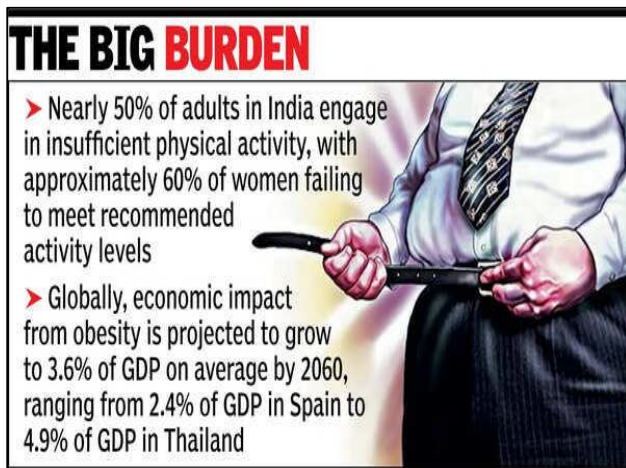
Context: India’s Obesity Crisis

Why in News?

India’s obesity crisis is driven by high carbohydrate consumption and low protein intake, contributing to rising non-communicable diseases despite economic growth.

Introduction

- India is facing a paradox: a country long burdened by malnutrition and undernourishment is now witnessing a rapid rise in obesity and diet-related non-communicable diseases (NCDs).
- The ICMR-INDIAB survey (2025) conducted with 1,21,077 adults across 36 States/UTs highlights that 62% of the daily calories for most Indians come from carbohydrates, mainly white rice, milled grains, and added sugars.
- Simultaneously, protein intake remains sub-optimal, deepening the crisis of being “overfed yet under-nourished.”
- This trend has wide-ranging implications for public health, social equity, economic productivity, and food policy.



(Image Sources: Times of India)

Historical Context: From Malnutrition to Double Burden of Malnutrition

- India's nutritional challenges have traditionally been defined by undernutrition, stunting, and wasting. With rising incomes and urbanisation, diets have changed — yet caloric sufficiency has not translated into nutrient sufficiency.
- Today, India faces a “double burden of

malnutrition”:

- Undernutrition persists in vulnerable groups.
- Overweight and obesity are increasing in both urban and rural populations.
- This shift underscores that economic growth alone cannot guarantee healthier diets unless macronutrient balance and dietary diversity are addressed.

The Core Dietary Imbalance: High Carbs, Low Proteins

Carbohydrate Dominance

- Average Indian meals are **grain-centric** — rice, wheat, roti, and rice-based dishes often constitute the bulk of the plate.
- Refined carbohydrates (polished rice, refined wheat, added sugars) dominate, providing **quick calories but poor satiety and nutrient density**.

Protein Deficiency

Per-capita **protein intake in many states remains below the recommended dietary allowance (RDA)**.

- Socio-cultural and political choices — e.g., **exclusion of eggs from midday meals in some states** — worsen the gap.
- Protein-rich foods like pulses, eggs, and dairy are often **costlier or culturally restricted**, leading to a heavy reliance on grains.

Public Health Implications

Rising Obesity and NCDs:

- India already has over **100 million adults living with diabetes** (ICMR, 2023).
- Obesity is increasingly prevalent in both **urban and rural populations**.
- **Childhood obesity** is alarming — more than **12 million children were grossly overweight in 2022**, compared to 0.4

million in 1990 (Lancet).

- **Hypertension and Cardiovascular Diseases:** High carbohydrate intake, especially refined carbs, contributes to **insulin resistance, belly fat, and hypertension**, aggravating the NCD burden.
- **Hidden Hunger:** Despite adequate calories, **micronutrient and protein deficiencies persist**, leading to **low immunity, fatigue, and poor cognitive development** in children.

Socio-Economic Dimensions

- **Healthcare Costs:** The growing NCD burden increases public and private health expenditure, straining households and the health system.
- **Economic Productivity:** Malnourished yet overweight adults face **reduced work capacity**, affecting labour-intensive sectors.
- **Food Security Paradigm:** The **Public Distribution System (PDS)** historically prioritised **rice and wheat** for caloric security, inadvertently encouraging high-carb consumption and sidelining coarse grains, pulses, and proteins.

Policy and Programme Challenges

- **Existing Measures**
 - **Promotion of Millets:** Declared '**International Year of Millets 2023**', with government incentives for millet production and inclusion in schemes like PDS and ICDS.
 - **School-Level Initiatives:** The **CBSE's directive for "sugar boards"** to reduce sugar consumption in schools.
 - **Front-of-Pack Labelling (FoPL)** proposals by FSSAI to alert consumers to excess salt, sugar, and fat in processed foods.

Limitations

- **Focus on Single Foods:** Promotion of millets alone does not address **overall macronutrient imbalance**.
- **Cultural and Political Barriers:** Resistance to including **eggs in midday meals** limits affordable protein access for children.
- **Weak Nutrition Literacy:** Most public health campaigns focus on **calories** rather than **protein-carbohydrate balance and food diversity**.

Way Forward:

Reorienting Food Subsidy Policies:

- Diversify PDS to include pulses, millets, fortified legumes, and eggs/dairy vouchers.

Child-Focused Interventions:

- Ensure protein-rich meals (including eggs and pulses) in midday meals and anganwadi nutrition programmes.

Behavioural Change and Awareness:

- Nationwide campaigns on balanced meals and portion control, highlighting the role of protein and fibre.
- Nutrition education should be part of school curricula.

Regulation of Processed Foods:

- Stricter marketing controls on sugar-laden and ultra-processed foods, especially targeting children.

Community and Healthcare Integration:

- Use primary health centres, ASHA workers, and digital tools to screen, counsel, and guide families about diet-related risks.

Conclusion:

- India's obesity crisis is not merely about excess calories but about a structural imbalance in diets, dominated by refined

carbohydrates and deficient in proteins and micronutrients.

- To reverse this trajectory, nutrition science must guide policy – from the PDS basket to school meals – and be supported by public awareness, healthcare integration, and equitable food access.

Nobel Prize 2025 – Peripheral Immune Tolerance

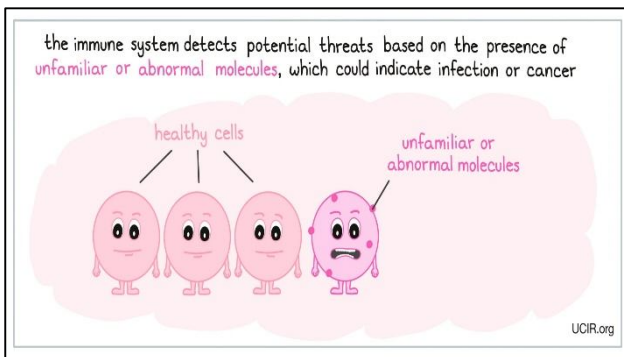
Source: Indian Express

UPSC Relevance: GS1 Public Health

Context: T cells (T-regs) and FOXP3

Why in News?

The 2025 Nobel Prize in Physiology or Medicine was awarded for discoveries on regulatory T cells (T-regs) and FOXP3, explaining how the immune system prevents attacks on the body's own tissues.



(Image Source: UCIR.org)

Introduction

- The 2025 Nobel Prize in Physiology or Medicine was awarded jointly to **Shimon Sakaguchi, Mary E. Brunkow and Frederick J. Ramsdell** for discoveries that explain how the immune system prevents attacks on the body's own tissues – a process called *peripheral immune tolerance*.
- Their work identified **regulatory T cells (T-regs)** and the key gene **FOXP3** that

controls their function. These findings reshaped our understanding of autoimmunity, transplantation, and cancer immunotherapy.

Background: Why the Question Matters

- The immune system must discriminate between foreign threats such as pathogens and the body's own cells.
- Earlier, the focus was on **central tolerance** – the deletion of self-reactive T-cells in the thymus.
- However, many autoimmune disorders and transplant-related responses indicated that further regulation existed outside the thymus.
- This led to the discovery of **peripheral immune tolerance**, which actively suppresses self-reactive cells throughout the body.

Contributions of the Laureates

Shimon Sakaguchi (1995)

- Through experiments in mice, Sakaguchi demonstrated that a small subset of CD4⁺ T cells expressing the CD25 marker prevents autoimmune disease. Removing these CD4⁺CD25⁺ cells caused widespread autoimmunity. This work established the existence and suppressive function of **regulatory T cells (T-regs)**.

Mary E. Brunkow and Frederick J. Ramsdell (2001)

- These researchers identified the transcription factor **FOXP3** as essential for the development and function of T-regs. Mutations in FOXP3 were linked to a rare but severe autoimmune disorder – **IPEX syndrome** – in humans, as well as a similar condition in mice known as the **scurfy** phenotype. This discovery proved that T-regs are genetically programmed to maintain self-tolerance.

Significance and Applications

- **Autoimmune Diseases:** The findings explain the underlying mechanism of diseases such as type-1 diabetes, rheumatoid arthritis, lupus, and IPEX syndrome. Therapeutic strategies now focus on enhancing T-reg activity to control these diseases.
- **Transplantation:** Strengthening T-reg function could reduce transplant rejection and limit the need for life-long immunosuppressive drugs.
- **Cancer Immunotherapy:** Tumours often evade immune attacks by recruiting T-reg. Reducing T-reg activity in cancer patients can help activate the immune system against tumours.
- **Drug Development:** These discoveries have opened the door for clinical trials exploring cell-based therapies targeting T-reg and FOXP3 for a range of diseases.

Policy Relevance for India

- **Health R&D:** India should invest in immunology research, develop specialised centres for autoimmune diseases, and encourage academia-industry collaboration for affordable therapies.
- **Clinical Trials & Infrastructure:** Expanding ethically regulated cell-therapy facilities and clinical trial centres will enable India to participate in global research.
- **Public Health Preparedness:** Better diagnostics for autoimmune disorders and genetic screening for conditions like IPEX can support early interventions.
- **Equity & Access:** Policies must ensure new therapies are affordable and included in public health insurance schemes.

Maldives Achieves World's First Triple Elimination of Mother-to-Child Transmission

Source: The Hindu

UPSC Relevance: GS2 Pubic Health

Context: Triple Elimination

Why in News?

The Maldives became the first country in the world to achieve WHO validation for triple elimination of mother-to-child transmission of HIV, syphilis, and hepatitis B.

Introduction

- In a historic milestone for global public health, the **World Health Organization (WHO)** has validated the **Maldives** as the **first country in the world** to achieve the **"triple elimination"** of **mother-to-child transmission (MTCT)** of **HIV, syphilis, and hepatitis B**.
- This recognition marks a major victory for maternal and child health, demonstrating that even small island nations can achieve ambitious global health targets through sustained political commitment, universal healthcare, and strong public health infrastructure.

Understanding the Concept of 'Triple Elimination'

- The **elimination of mother-to-child transmission (EMTCT)** refers to reducing the rate of transmission of infections from mother to infant to such a low level that it is no longer a public health concern.
- The **WHO Triple Elimination Initiative** aims to integrate prevention of transmission of **HIV, syphilis, and hepatitis B** into reproductive, maternal, newborn, and child health services.

- Mother-to-child transmission is one of the key routes of infection for these diseases:
- **HIV:** Can be transmitted during pregnancy, delivery, or breastfeeding.
- **Syphilis:** Leads to congenital infections, stillbirths, and neonatal deaths.
- **Hepatitis B:** Can cause lifelong chronic infection and liver disease if transmitted at birth.



(Image Source: The Hindu)

Maldives' Path to Triple Elimination

- The Maldives' journey toward this global recognition was built on a **comprehensive, integrated, and equitable public health approach**. The following were the key factors behind its success:
- **Universal Antenatal Coverage and Testing** Over 95% of pregnant women in the Maldives receive **antenatal care**, with **nearly universal testing** for HIV, syphilis, and hepatitis B. This enables early detection and immediate treatment or preventive measures.
- **High Immunisation Rates** More than 95% of newborns receive a **timely birth dose of the hepatitis B vaccine**, followed by full vaccination coverage, which effectively prevents vertical transmission.
- **Effective Treatment and Prevention Protocols** Pregnant women testing positive for HIV or syphilis are promptly

treated, ensuring that no infants are born with these infections. In 2022 and 2023, the Maldives reported **zero cases of infants born with HIV or syphilis**, while a national survey in 2023 confirmed **zero hepatitis B infection** among school-entry children.

- **Universal Health Coverage (UHC)** The Maldives provides **free antenatal care, diagnostics, and vaccinations** to all residents, including migrants. Health expenditure accounts for **over 10% of GDP**, reflecting the government's strong commitment to maternal and child health.
- **Robust Health Infrastructure and Surveillance** Integrated data systems, laboratory networks, and periodic national surveys have ensured reliable monitoring, enabling evidence-based policymaking and validation by WHO.

Global and Regional Significance

- The Maldives' achievement is **unprecedented** – no other country has achieved triple elimination to date. It serves as a **model for small island developing states and low- and middle-income countries**, proving that size and geography are not barriers when there is strong political will and community-level healthcare coverage.
- In the **WHO South-East Asia Region**, over **23,000 pregnant women** had syphilis and **25,000 HIV-positive pregnant women** required treatment to prevent transmission in 2024, while **42 million people** continue to live with hepatitis B. The Maldives' success provides **hope and direction** for other countries to accelerate their EMTCT efforts.

Challenges and Sustainability Concerns

- While the achievement is commendable, maintaining elimination status poses long-term challenges:
- **Sustained surveillance and data quality** are crucial to detect and prevent any resurgence.
- **Population mobility and migration** can reintroduce infections, requiring continuous inclusion of migrant populations in health programs.
- **Financial sustainability and training of health workers** must be maintained to ensure uninterrupted service delivery.

Lessons for India and Other Developing Nations

- India, with its vast population and diverse healthcare infrastructure, can draw key lessons from the Maldives' experience:
- **Integration of Services:** Triple screening for HIV, syphilis, and hepatitis B should be standard in all antenatal care visits.
- **Timely Hepatitis B Birth Dose:** Ensuring vaccination within 24 hours of birth, even in rural and home delivery settings.
- **Universal Health Access:** Inclusion of vulnerable groups such as migrants, informal workers, and tribal communities in free maternal healthcare schemes.
- **Surveillance and Monitoring:** Strengthening health information systems for tracking infections and vaccination coverage.
- **Sustained Political Commitment:** Continuous government investment in maternal and child health programs under **National Health Mission (NHM)** and **Ayushman Bharat**.

Way Forward

The Maldives' achievement demonstrates that **elimination of vertical transmission** is not only a medical goal but also a reflection of **social equity, governance, and resilience**. Other countries must:

- Integrate EMTCT efforts with national **Universal Health Coverage (UHC)** strategies.
- Ensure **multisectoral coordination** between immunisation, HIV control, and maternal health programs.
- Build **community trust and awareness** to sustain high testing and vaccination rates.

Conclusion:

- The Maldives' validation by WHO for **triple elimination** marks a **global public health breakthrough**. It shows that through **universal healthcare, robust surveillance, and political commitment**, even small nations can lead the world in achieving complex health goals.

Urgent Need to Bring Stroke Rehabilitation into the Mainstream

Source: The Hindu

UPSC Relevance: GS2 Public Health

Context: Stroke rehabilitation

Why in News?

India records around 1.8 million new stroke cases annually, yet less than 20% of survivors receive structured rehabilitation.

Introduction

- Stroke is one of the leading causes of death and long-term disability in India. While advances in emergency treatment

have saved countless lives, the recovery journey of a stroke survivor remains an overlooked challenge.

- Rehabilitation—an essential process that helps survivors regain mobility, speech, and independence—remains fragmented and under-prioritised in India's healthcare framework.
- As the nation grapples with an ageing population and rising incidence of non-communicable diseases, mainstreaming stroke rehabilitation is no longer a luxury—it is a public health necessity.

Understanding the Magnitude of the Problem

- According to estimates, India records nearly **1.8 million new stroke cases every year**, making it one of the highest global contributors to stroke-related mortality and disability.
- The **World Health Organization (2023)** recommends that rehabilitation should ideally begin within **24–48 hours** of a stroke. However, only **one in five** Indian survivors receive structured rehabilitation.
- This gap between emergency care and long-term recovery has created a silent crisis — where survival is not synonymous with recovery. Survivors often return home with residual paralysis, speech difficulties, or cognitive impairment, which can worsen without continuous therapy.
- Moreover, **stroke caused about 6.99 lakh deaths in India in 2019**, accounting for **7.4% of all fatalities**, reflecting the gravity of the condition's health and economic impact.

The Cost and Inequity of Recovery

- Stroke treatment is an expensive journey, divided into two distinct phases:

- **Acute Care Phase** – Involving emergency procedures like clot-busting drugs, imaging, and surgery. This phase typically costs between **₹2 lakh to ₹8 lakh**.
- **Rehabilitation Phase** – The long-term recovery process involving physiotherapy, speech therapy, and occupational therapy, costing **₹10,000–₹30,000 per month**.
- For most Indian families, the rehabilitation phase is financially unsustainable. **Insurance coverage rarely includes rehabilitation**, leading to high out-of-pocket expenses and, in many cases, **catastrophic health expenditure**.
- This problem is further compounded by **geographical inequality**. While metropolitan cities host advanced neuro-rehabilitation centres, **rural and semi-urban India** faces a severe shortage of specialists and institutions.
- Consequently, many stroke survivors in smaller towns rely on untrained caregivers or informal treatment, reducing the chances of full recovery.



(image Source: The Hindu)

The Human and Emotional Dimension

- Stroke not only transforms the life of the survivor but also that of the caregiver. Families are often thrust into a cycle of **emotional, social, and financial strain**.
- Research shows that **over 60% of**

caregivers experience depression or anxiety within six months of assuming caregiving responsibilities.

- In India, where **formal caregiver support systems are largely absent**, these individuals face burnout and isolation. The dual loss of income—from both the survivor and the caregiver—further compounds poverty and emotional distress.
- Thus, stroke rehabilitation must be viewed not only as a medical necessity but also as a **social welfare and economic resilience issue**.

Rehabilitation: The Missing Link in India's Stroke Care

- Despite policy progress in tertiary healthcare, rehabilitation continues to be treated as a secondary concern. India's healthcare system focuses disproportionately on **saving lives** rather than **restoring them**.
- Rehabilitation units are typically concentrated in major hospitals, while **district and rural hospitals** often lack even basic physiotherapy infrastructure.
- To make rehabilitation mainstream, the following reforms are critical:
 - **Integration of Multidisciplinary Rehabilitation Units** Every district hospital should include coordinated rehabilitation facilities, involving physiotherapists, occupational therapists, speech-language pathologists, and psychologists.
 - **Insurance Coverage for Rehabilitation** Government and private health insurance schemes (like Ayushman Bharat - PM-JAY) should explicitly include **long-term rehabilitation** to prevent financial distress.
 - **Capacity Building and Workforce**

Training India urgently needs to **expand training programmes** for physiotherapists and neuro-rehabilitation experts to meet rising demand.

Leveraging Technology and Innovation

- **Telerehabilitation platforms** can connect patients in remote areas with specialists.
- **AI-assisted recovery tools** and mobile-based physiotherapy apps can monitor progress and personalise treatment.
- **Community-based rehabilitation models** can empower local health workers to deliver basic therapy under supervision.

Public Awareness and Preventive Focus

- Public health campaigns such as **'FAST' (Face, Arms, Speech, Time)** have helped improve awareness about recognising stroke symptoms.
- However, messaging must now evolve to emphasise the **"rehabilitation window"** — the crucial first few months after stroke when recovery potential is highest.
- Promoting early rehabilitation awareness can ensure better neurological outcomes and reduce the long-term socio-economic burden of disability.

Policy Imperatives and Institutional Reforms

- The government's ongoing efforts under the **National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS)** must be expanded to include **structured rehabilitation modules** at the primary and secondary healthcare levels.
- Additionally, integrating rehabilitation into **Ayushman Bharat Health and**

Wellness Centres (HWCs) can help decentralise access. Collaboration between **public health departments, NGOs, and private hospitals** is essential to develop an integrated stroke recovery ecosystem.

Conclusion:

- India's healthcare policies must therefore evolve from **"life-saving" to "life-restoring"**. Mainstreaming stroke rehabilitation—through awareness, technology, insurance reform, and institutional integration—is essential for building a **humane, inclusive, and sustainable public health system**.



ART AND CULTURE

Hungarian Master of Apocalypse Gets 2025 Nobel Prize in Literature

Source: Indian Express

UPSC Relevance: GS1 Awards and Honours

Context: 2025 Nobel Prize in Literature

Why in News?

László Krasznahorkai, a Hungarian novelist known for his apocalyptic literary style, won the 2025 Nobel Prize in Literature for his “singular prose that reaffirms the power of art amid existential crises



(Image Source: Indian Express)

Introduction

- The 2025 Nobel Prize in Literature has been awarded to **László Krasznahorkai**, a 71-year-old Hungarian novelist and screenwriter, for his “**singular prose that, in the midst of apocalyptic terror, reaffirms the power of art.**”
- He becomes the **second Hungarian** after Imre Kertész (2002) to receive this prestigious recognition. Krasznahorkai's oeuvre is distinguished by its

philosophical depth, long-form sentences, and focus on existential, historical, and societal crises.

Early Life and Literary Journey

- **Born:** 1954, Gyula, Hungary, near the Romanian border.
- **Background:** Raised in a **Jewish, rural, and repressive environment** during the long twilight of state socialism, his early life sensitized him to history, memory, and human resilience.
- **Education:** Studied **law and literature in Budapest**, blending rigorous academic training with literary experimentation.
- **Debut Novel:** *Sátántangó* (1985), set in a dying collective farm, became an immediate sensation for its **philosophical insight** and narrative innovation.
- **Collaborations:** His long-term partnership with filmmaker **Béla Tarr**, who adapted *Sátántangó* into a seven-hour cinematic masterpiece, cemented his reputation as a chronicler of existential and societal collapse.

Themes and Literary Style

- **Apocalypse and Human Resistance:** Krasznahorkai's works often explore the **tension between societal collapse and human agency**, portraying moral, spiritual, and institutional decay. Key works include:
 - *The Melancholy of Resistance* (1989): Depicts the collapse of order in a small town disrupted by a traveling circus.
 - *War and War* (1999): Follows a

Hungarian archivist determined to preserve a transcendent manuscript amidst societal disintegration.

- *Seiobo There Below* (2008) and *Destruction and Sorrow Beneath the Heavens* (2004): Reflect his engagement with Asian art, philosophy, and cultural pilgrimage.
- **Literary Style - Sentence as Architecture:** Krasznahorkai is known for **long, recursive sentences** that often span multiple pages, creating an immersive experience.
 - His prose requires **patience and sustained attention**, allowing readers to engage deeply with existential themes. He described his approach as:
 - "Letters; then from letters, words; then from these words, some short sentences; then more sentences that are longer... Beauty in language. Fun in hell."
- **Philosophical Underpinnings:** His works interrogate **moral collapse, memory, history, and hope**, portraying art as both a witness and a defense against societal decay. He is lauded for combining Central European literary traditions (Kafka, Beckett, Musil) with a global, especially Asian, perspective.

Significance of the 2025 Nobel Award

- **Recognition of Existential Literature:** By awarding Krasznahorkai, the Swedish Academy highlights literature that engages with **existential dread, climate crises, conflict, and historical consciousness**, resisting the pressures of populism or commercial trends.
- **Faith in Human Agency:** Krasznahorkai's work emphasizes **resilience and human dignity**, offering a philosophical framework for

interpreting contemporary global challenges.

- **Defiance of Literary Conventions:** The award celebrates experimental narrative forms, where the **prose itself becomes an instrument of meaning**, showing that literature need not conform to short, market-friendly formats to remain impactful.

About the Nobel Prizes

- **Origin:**
 - Established in **1895 in the will of Alfred Nobel**, a Swedish industrialist and inventor of dynamite.
 - Nobel Prizes are awarded in **Peace, Literature, Physics, Chemistry, Medicine, and Economic Sciences**.
- **Significance:**
 - Recognizes **outstanding contributions to humanity** in scientific, cultural, and humanitarian fields.
 - Awards include a **medal, diploma, and cash prize**.
 - Serve as a **global benchmark for excellence**, influencing public discourse, policy, and research priorities.
- **Nobel Prize in Literature:**
 - Awarded by the **Swedish Academy**.
 - Recognizes authors whose work exhibits **idealistic, artistic, and intellectual contributions** to literature.
 - Past Hungarian laureates include **Imre Kertész (2002)**.

Conclusion:

- László Krasznahorkai's Nobel Prize reflects a **commitment to literature that confronts despair with intellectual rigor and moral reflection**.

Strengthening Public-Private Partnerships for Sustainable Heritage Conservation in India

Source: Indian Express

UPSC Relevance: GS1 Culture and Heritage

Context: India's heritage conservation

Why in News?

India's heritage conservation requires a synergized approach involving the Archaeological Survey of India, private sector participation, and community engagement for sustainable preservation.

Introduction

- India's rich cultural and architectural heritage—ranging from ancient monuments to historic urban landscapes—is a testament to centuries of artistic, religious, and civic development.
- Preservation of these sites is crucial not only for **cultural identity and education** but also for **tourism and local economic development**.
- Institutions like the **Archaeological Survey of India (ASI)** and organizations such as **INTACH** have historically played a central role in heritage management.

Challenges in Heritage Conservation

- Declining Institutional Capacity:**
 - The ASI, empowered by **Lord Curzon in the early 20th century**, commanded respect and effectively protected monuments across India.
 - In recent decades, its relevance has been challenged by **shifting government priorities**, particularly the emphasis on **culture and tourism over conservation**.
 - Bureaucratic delays, inadequate funding, and insufficient technical expertise have further limited its

effectiveness.

Lack of Skilled Manpower and Leadership:

- Heritage conservation requires **specialized skills in architecture, archaeology, and community management**, which are often in short supply.
- The need for visionary leadership at both **institutional and project levels** has been a persistent challenge.
- Urbanization and Vested Interests:**
- Rapid urban growth and encroachment pose significant threats to heritage sites.
- Local vested interests sometimes **obstruct conservation efforts**, complicating restoration projects and community engagement.



(Image Source: Indian Express)

Role of the Private Sector

Public-Private Partnerships (PPP):

- The **central government's initiative** to invite corporate sponsorship through PPPs provides a **model for effective conservation**, combining expertise, finance, and management skills.
- Successful examples include the **Elephanta Caves and Dr Bhau Daji Lad Museum in Mumbai**, where PPP interventions revitalized sites while uplifting local communities.

Expertise and Technology:

- Corporate participation can **attract skilled professionals** in architecture, conservation science, and ecological management.

- They can also introduce **modern project management techniques, digital documentation, and sustainable development plans.**

Community Upliftment:

- PPP projects often incorporate programs for **training and skill development** of local communities, ensuring **livelihood opportunities** while preserving cultural sites.
- This approach addresses both **heritage conservation and socio-economic development**, making preservation inclusive and sustainable.

Archaeological Survey of India (ASI)

- The **Archaeological Survey of India (ASI)**, operating under the **Ministry of Culture**, is the country's foremost agency for archaeological research and the preservation of India's cultural heritage.
- Its work is governed by the **Ancient Monuments and Archaeological Sites and Remains (AMASR) Act, 1958.**
- The ASI manages over **3,650 monuments, archaeological sites, and remains of national importance.**
- Its responsibilities include conducting surveys of antiquities, excavating archaeological sites, and conserving and maintaining protected monuments.
- The ASI was established in **1861 by Alexander Cunningham**, who served as its first Director-General and is revered as the **"Father of Indian Archaeology."**

Empowering ASI and Heritage Professionals

Harmonized Approach:

- Experts argue that the ASI and **conservation architects must work in harmony**, following the model of historical guilds where expertise was shared and preserved across

generations.

- Effective collaboration between government bodies, professionals, and private stakeholders can ensure **scientific restoration while respecting historical authenticity.**

Defining 'Monument' and Conservation Priorities:

- Clear legal and administrative definitions of monuments are essential to **prioritize conservation efforts.**
- Decision-makers need to combine **historical knowledge with imaginative foresight** to identify sites of national significance and allocate resources effectively.

Way Forward

- The preservation of India's heritage requires a **multi-pronged approach:**
- **Strengthening institutional capacity:** Empowering the ASI with funding, autonomy, and professional expertise.
- **Leveraging private sector participation:** Through PPPs, corporations can bring **technical know-how, financial resources, and community engagement.**
- **Inclusive conservation:** Projects should simultaneously **preserve heritage and uplift local communities**, ensuring sustainability.
- **Long-term vision:** Heritage conservation must go beyond tourism and politics, emphasizing **cultural identity, education, and historical continuity.**

Conclusion:

- By integrating **government efforts, private expertise, and community participation**, India can ensure that its **monuments and heritage sites not only survive but thrive**, becoming enduring symbols of its rich past and sources of inspiration for future generations.

DISASTER MANAGEMENT

The Disaster in Darjeeling: A Multi-Dimensional Crisis

Source: Indian Express

UPSC Relevance: GS3 Disaster Management

Context: Disaster in Darjeeling

Why in News?

Darjeeling's 2025 floods and landslides highlight the combined impact of climate change, unsustainable hill development, and weak institutional disaster management on human lives, livelihoods, and national security.



(Image Source: Indian Express)

Introduction

- Darjeeling – often called the *Queen of Hills* – has once again suffered a severe disaster due to **exceptionally heavy rainfall** in early October 2025.
- The **Dudhia bridge** over the Balason River was washed away, cutting off connectivity between Siliguri and Mirik, and disrupting national and state highways.
- The event underscores how **unsustainable development**, altered

rainfall patterns due to climate change, and weak institutional response have made the Himalayan hills more disaster-prone.

- This crisis highlights the **intersection of environment, society, economy, and national security**, making it a vital case study for disaster management and sustainable development in fragile mountain ecosystems.

Historical Vulnerability of Darjeeling

Darjeeling has a long history of natural disasters:

- Major **landslides** recorded in **1899, 1934, 1950, 1968, 1975, 1980, 1991, 2011, 2015**.
- The **1968 floods** alone killed over a thousand people.
- Nine **cloudburst events** in the **Teesta Valley (1902-1978)** documented by the Centre for Science and Environment (1991).
- Leila Seth's memoir *On Balance* (2003) captures the devastation of the 1950 landslides.
- **Key Insight:** Natural disasters are not new to the region, but their **frequency, intensity, and impact have increased** due to anthropogenic pressures and climate variability.

Drivers of the Present Crisis

1. Climate Change-Induced Rainfall Shift

- Traditional '**sawnaay jhari**' (gentle, prolonged monsoon showers) has been replaced by '**mushaldhare varsha**' (short, intense cloudbursts).
- **Concentrated downpours** lead to flash floods, slope failures, and river course

changes.

- Similar patterns have been observed in the 2023 Lhonak Lake GLOF in Sikkim.

2. Unsustainable Development in Fragile Hills

- **Hydropower, railways, hotels, and unregulated construction** have exceeded the **carrying capacity** of the hills.
- Encroachment on **riverbeds, jhoras (streams), and floodplains** has obstructed natural drainage, amplifying floods and landslides.
- Quarrying and deforestation for infrastructure projects weaken slopes.

3. Demographic Pressure and Land Use Change

- Significant **in-migration from the plains and neighbouring countries** over recent decades.
- **Land-property boom** in the last 30 years has driven construction on unstable slopes.

4. Hydrological and Geomorphological Instability

- Rivers and streams in the Teesta basin have shown **unprecedented course changes**, intruding into habitations and farms.

Institutional and Governance Deficits

Weak Local Capacity

- **Municipalities and panchayats**, once reputed for strong governance in the colonial era (1860s), now lack even **basic solid waste management systems**, adding to urban flooding risks.
- The **Gorkhaland Territorial Administration (GTA)** and local bodies lack **technical expertise, funds, technology, and manpower** for disaster mitigation.

Limited Disaster-Specific Institutions

- **District Collector-centric response** is

inadequate for complex mountain hazards.

- Absence of specialised **mountain disaster management units** and **climate change research centres** for Eastern Himalayas.
- Proposals such as converting the **Forest Rangers College, Kurseong** into a **Climate Change Studies and Management Centre** remain unimplemented.

Scientific Warnings Ignored

- **ISRO's Landslide Atlas 2023:** Darjeeling ranks **35th among 147 most landslide-exposed districts** in India.
- **NGOs like "Save the Hills" (Col Praful Rao)** have repeatedly flagged the risks through awareness campaigns.
- The **Sikkim Human Development Report 2001** had predicted the **GLOF risk** that materialised in 2023, causing damages worth **₹25,000 crore (≈60 % of Sikkim's 2022-23 GDP)** and downstream destruction in Darjeeling and Jalpaiguri.
- **Lesson:** Lack of preventive action despite clear scientific evidence aggravates disaster losses.

Economic and Livelihood Impacts

- **Darjeeling Tea**, a Geographical Indication product and a major foreign-exchange earner, faces **soil erosion, erratic rainfall, and transport disruptions**.
- Traditional sectors – **tourism, cinchona & quinine cultivation, horticulture, and education hubs** – are under stress.
- Damage to **infrastructure (roads, bridges, hydropower)** hampers local and regional economies.

National Security Dimensions

- Darjeeling lies near the **Siliguri Corridor (the "Chicken's Neck")**, a narrow strip linking mainland India to the Northeast.
- Disasters disrupt **troop movement, supply chains, and border logistics** in this strategically sensitive zone adjoining **Nepal, Bhutan, Bangladesh, and China-occupied Tibet**.
- The 2023 GLOF also destroyed **military installations and hydropower assets**, highlighting **climate-security linkages**.
- Therefore, Darjeeling's stability is not merely a state issue but a **strategic national priority under India's Act East Policy**.

Lessons and Way Forward

1. Integrated Mountain-Specific Disaster Management

- Establish a National Himalayan Disaster Risk Reduction Authority with regional centres (e.g., Eastern Himalaya hub in Kurseong).
- Early Warning Systems: Strengthen IMD forecasts, community-level alerts, and hydrological monitoring of rivers and glacial lakes.

2. Climate-Resilient Planning

- Conduct carrying-capacity studies before approving hydropower, tourism, and urban projects.
- Promote eco-friendly infrastructure (bio-engineering for slope stabilisation, green roofs, permeable pavements).

3. Strengthen Local Institutions

- Capacity-building for GTA, municipalities, and panchayats in solid-waste management, drainage planning, and emergency response.
- Enhance State Disaster Response Forces (SDRFs) and link them with NDRF and Army units.

4. Sustainable Livelihoods

- Climate-resilient agriculture and tea cultivation, diversification into horticulture, medicinal plants, eco-tourism.

5. Regional and International Cooperation

- Collaborate with Nepal, Bhutan, Bangladesh, Myanmar, and China-Tibet for transboundary river management, GLOF monitoring, and mountain research.

Conclusion:

- The Darjeeling disaster illustrates how ecological fragility, climate change, and human negligence can combine to magnify hazards into humanitarian and strategic crises.
- A paradigm shift is needed — from reactive relief to proactive resilience-building, backed by science-led planning, empowered local governance, and national-level prioritisation of the Himalayas as critical for both environmental sustainability and national security.



GEOGRAPHY

Northeast Monsoon- Timely Onset Brings Relief and Agricultural Promise for Southern India

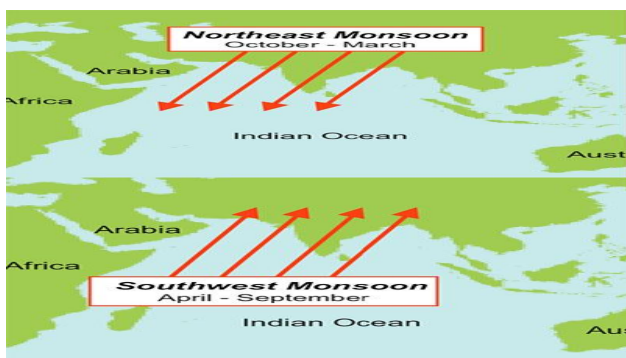
Source: The Hindu

UPSC Relevance: GS1 Geography

Context: Northeast Monsoon

Why in News?

The timely arrival of the 2025 northeast monsoon benefits agriculture in southern India, especially Tamil Nadu and coastal Andhra Pradesh.



(Image Source: Siam Divers.com)

Introduction

- The **northeast monsoon**, also known as the **retreating monsoon**, is a critical weather system for the southern peninsula of India. It primarily affects **Tamil Nadu, coastal Andhra Pradesh, and the Rayalaseema region**.
- Unlike the southwest monsoon, which dominates from June to September, the northeast monsoon typically sets in around **October 20 (± 7 days)**.
- However, in 2025, it **arrived on October**

16, providing early relief to farmers and authorities.

Significance of the Northeast Monsoon

Agricultural Importance:

- The northeast monsoon contributes **48% of Tamil Nadu's annual rainfall** and over **30% of Andhra Pradesh's**, making it a **vital source of water for crops**, especially paddy, sugarcane, and pulses.
- Its timely arrival ensures adequate soil moisture, mitigates drought conditions, and **supports the rabi cropping season**.
- The early onset of monsoon in 2025 is particularly beneficial amidst concerns like **fertilizer shortages**, especially urea, which has affected multiple southern states. Tamil Nadu's Chief Minister **M.K. Stalin** had raised this issue with the **Union Ministry of Agriculture**, prompting an increase in urea allocation to **36.65 lakh tonnes in October 2025**.

Disaster Management Perspective:

- The northeast monsoon is accompanied by **cyclonic disturbances in the Bay of Bengal**—at least three per season on average—along with **cloudbursts and heavy rainfall events**, particularly in urban areas.
- **Chennai and other coastal cities** are prone to **urban flooding**, largely due to inadequate **stormwater drains, poor watercourse maintenance, and encroachment on water bodies**.
- Lessons from the **past decade** indicate that effective **coordination among agencies** has reduced the **loss of lives**, although infrastructural and community-level challenges remain.

Government and Administrative Measures

- **Real-Time Flood Forecasting:**
 - The Tamil Nadu government is establishing a **real-time flood forecasting system** for Chennai to manage **reservoir discharges** effectively and prevent urban inundation.
 - Other southern states are similarly preparing their **official machinery for disaster response**, highlighting a **proactive approach to monsoon management**.
- **Community Participation and Urban Governance:**
 - Authorities emphasize the **role of local residents** in maintaining water bodies and preventing dumping of waste, as **community ownership** is currently minimal.
 - Sustainable urban water management requires **joint responsibility between state governments and citizens** to mitigate urban flooding.
- **Agricultural Supply Chain Preparedness:**
 - Ensuring **adequate availability of fertilizers**, particularly urea, is essential to **capitalize on timely monsoon rains**.
 - The government's intervention in increasing fertilizer allocation illustrates the **link between monsoon forecasting and agricultural planning**.

Macro Implications and Challenges

- **Intense Rainfall:**
 - The India Meteorological Department (IMD) forecasts "above normal" rainfall—over **112% of the long-period average**—raising the

need for **heightened vigilance at all administrative levels**.

- While abundant rainfall benefits agriculture, it can exacerbate **flood risks in urban and coastal areas**, requiring **synchronized disaster preparedness**.
- **Disaster Risk Reduction:**
 - Modern challenges like **cloudbursts, cyclonic activity, and urbanization** demand **integrated approaches**, combining **meteorological forecasts, infrastructure planning, and community engagement**.
- **Policy and Planning Linkages:**
 - The northeast monsoon demonstrates the **interconnectedness of weather, agriculture, and governance**.
 - Timely arrival and proper management of monsoon rains not only **support farmers and food security** but also **reduce socio-economic losses** from floods and related hazards.

Conclusion:

- The **early onset of the northeast monsoon in 2025** is a positive development for southern India, particularly for **agriculture and disaster management**.

Samples of India's Only Active Mud Volcano in Andaman Date Back to 23 Million Years: GSI

Source: The Hindu

UPSC Relevance: GS Paper 1 – Geography (Geomorphology, Volcanoes); GS Paper 3 – Disaster Management, Environment

Context: Baratang Mud Volcano in the Andaman and Nicobar Islands

Why in News

The Geological Survey of India (GSI) confirmed that the Baratang Mud Volcano in the Andaman and Nicobar Islands contains samples dating back to the Oligocene epoch (~23 million years ago).



Image Source: The Tribune

Key Scientific Insights

Following a fresh mud eruption reported on October 2, 2025, a GSI team visited the site on October 8–9, collecting and analysing samples to determine their age and composition.

- **Ancient Geological Heritage:** The lithoclasts (rock fragments) ejected from the crater are composed of **sandstone and shale** of the **Mithakari Group**, dating to the **Oligocene period (33.9–23 million years ago)**. These sediments preserve the deep geological history of the Andaman Basin, which once formed part of the greater Indo-Burmese subduction zone.
- **Nature of the Eruption:** The Baratang volcano releases **cold mud and gases**, not lava. The emitted slurry shows a **surface temperature of 29–30°C** and **pH 8.0–8.3**, indicating a **weakly alkaline** environment. An **oily sheen** on the mud surface suggests traces of **hydrocarbon gases (methane and ethane)** in the subsurface.
- **Probable Causes:**
 - **Diapiric movement** of over-

pressured shale layers.

- **Tectonic compression and fault activity** from the subduction of the Indian Plate beneath the **Burma Microplate**.
- **Hydrocarbon generation and fluid escape** from deep sedimentary beds.
- **Safety Measures:** The GSI recommended **restricted tourist access**, construction of a **viewpoint platform**, and **hazard signage** to protect visitors from unpredictable bursts.

About the Geological Survey of India (GSI)

- **Establishment:** Founded in **1851**, the GSI is one of the world's oldest scientific agencies, operating under the **Ministry of Mines, Government of India**.
- **Headquarters:** Kolkata, West Bengal.
- **Mandate:** To carry out **geoscientific surveys, natural resource mapping, mineral exploration, and geohazard assessment** across the country.
- **Global Contributions:**
 - Instrumental in identifying **coal and mineral reserves** during the colonial period.
 - In post-independence India, expanded its scope to include **seismotectonic studies, glaciology, landslide monitoring, and marine geology**.
 - Operates field divisions in **Andaman–Nicobar, North Eastern Region, and Himalayan sectors** — focusing on **earthquake hazard zoning** and **geoheritage preservation**.
- **Current Focus Areas:**
 - **Geo-heritage and geopark development**.
 - **Landslide and coastal hazard**

monitoring.

- Digital geoscience data infrastructure.
- Marine geoscience and resource exploration in EEZ.

India Relevance

1. **Geo-heritage & Research Value:**
The Baratang site, being India's **only active mud volcano**, is a rare natural observatory for studying subduction processes, sediment deformation, and hydrocarbon migration.
2. **Tourism & Awareness:**
Promoting **geo-tourism** under safety protocols can enhance local income while spreading scientific awareness about India's dynamic geology.
3. **Energy Exploration:**
Methane seepage and the presence of hydrocarbons can guide **offshore oil and gas exploration** in the Andaman Basin.
4. **Disaster Preparedness:**
Continuous GSI monitoring supports **hazard mapping and early warning systems**, crucial for island safety and coastal management.
5. **Strategic Geography:**
The Andaman region's tectonic activity offers vital data for **infrastructure planning, seismic risk mitigation, and defence operations** in India's eastern maritime zone.

Broader Global Implications

- **Climate Linkage:** Mud volcanoes release **methane**, a potent greenhouse gas; studying these emissions improves understanding of **natural vs anthropogenic climate forcing**.
- **Comparative Geology:** Baratang joins global mud-volcano belts like **Azerbaijan's Caspian fields, Indonesia's Sidoarjo, and Pakistan's Makran coast**, all lying along active subduction margins.
- **Earth-System Science:** Continuous monitoring enhances global research on **fluid migration, sub-crustal stress, and earthquake precursors** – key themes in UNESCO's **International Geoscience Programme (IGCP)**.

Conclusion:

The Baratang mud volcano represents a living record of India's geological past and ongoing plate movements. The GSI's findings not only enrich academic understanding but also highlight the necessity of **geo-conservation, safe tourism, and integrated research** that link India's natural heritage to global scientific efforts in climate and tectonic studies.



MODERN HISTORY

150 Years of 'Vande Mataram'

Source: The Hindu

UPSC Relevance: GS 1 Modern History

Context: Vande Mataram

Why in News?

Prime Minister Narendra Modi, in the October 2025 *Mann Ki Baat* episode, acknowledged the 150th anniversary of "Vande Mataram", written by Bankim Chandra Chattopadhyay in 1875.



(Image Source: The Hindu)

Introduction

- In the 127th episode of *Mann Ki Baat* (October 26, 2025), Prime Minister Narendra Modi acknowledged the completion of **150 years of Vande Mataram** — a momentous milestone in India's cultural and nationalist history.
- He noted that the nation will enter the 150th year of its celebration on **November 7, 2025**, highlighting its enduring legacy as a symbol of unity, patriotism, and India's spiritual nationalism.

Historical Background

1. Authorship and Origin

- *Vande Mataram* was written by **Bankim Chandra Chattopadhyay** in 1875 (some accounts suggest 1872), and was later included in his famous novel '**Anandamath**' (1882).
- The song was originally composed in **Sanskrit and Bengali**, blending devotional fervour with patriotic zeal.
- The phrase "*Vande Mataram*" translates to "**I bow to thee, Mother**", referring to **Mother India** as the divine embodiment of the nation.

2. Inspiration and Context

- Written during the late 19th century, *Vande Mataram* emerged when **British colonial rule** was firmly established and Indian nationalism was in its formative stage.
- Bankim Chandra envisioned **Bharat Mata (Mother India)** as a sacred motherland, blending **spiritual devotion** with **national awakening** — a fusion of *bhakti* (devotion) and *deshbhakti* (patriotism).
- The song invoked the imagery of India as a **divine mother goddess** — fertile, powerful, and benevolent — calling her children to free her from bondage.

Cultural and Literary Significance

1. Composition and Language

- *Vande Mataram* is notable for its **Sanskritized Bengali**, rich in metaphors

and rhythm.

- It describes the motherland as clothed in green fields, sweet with the sound of flowing rivers, and radiant with prosperity.

2. Musical Adaptation

- The song was **set to music** by **Jadunath Bhattacharya** and later **popularised** by **Rabindranath Tagore**, who also sang it for the first time at the **1896 Indian National Congress session in Calcutta**.
- Its lyrical beauty and spiritual tone made it a **rallying cry for national unity** and a **source of inspiration** during India's struggle for independence.

Role in the Indian Freedom Movement

1. Symbol of National Resistance

- Vande Mataram* soon became the **anthem of the Indian freedom struggle**.
- It was recited in political meetings, protest marches, and revolutionary movements, uniting people across regions, religions, and languages.
- The song's use spread rapidly during the **Swadeshi Movement (1905-1911)** following the **Partition of Bengal**.
- It became a **mobilizing slogan** for nationalists and revolutionaries, much like "Inquilab Zindabad" and "Jai Hind" in later decades.

2. Controversy and Compromise

- Some Muslim leaders objected to portions of the song that personified India as a goddess, which they viewed as inconsistent with Islamic monotheism.
- To address this, the **Constituent Assembly in 1948** adopted only the **first two stanzas** of *Vande Mataram* as the **National Song of India**, while *Jana Gana Mana* was adopted as the **National**

Anthem.

- This ensured that *Vande Mataram* retained its **cultural and historical stature**, while *Jana Gana Mana* served as the official anthem symbolizing inclusivity.

Official Recognition

- National Song:** Declared alongside the National Anthem by the Constituent Assembly on **January 24, 1950**.
- The first two stanzas are officially recognized, as they express the **love and reverence for the motherland** without invoking divine imagery.
- The song remains a **fixture in national ceremonies**, Independence Day and Republic Day celebrations, and cultural programs across the country.

Philosophical and Symbolic Meaning

Theme	Description
Motherland as Divine	India personified as a nurturing mother, drawing from Hindu imagery of goddess Durga.
Unity in Diversity	Blends devotion, nationalism, and natural beauty—representing India's diverse landscape and people.
Spiritual Nationalism	Encourages moral awakening and self-sacrifice for the nation's freedom.
Cultural Renaissance	Inspired revival of Sanskrit and classical Indian thought during colonial modernity.

Modern Relevance (2025 Context)

- In the *Mann Ki Baat* address (Oct 2025),

PM Modi emphasized that the **world of culture and social media** has given **Sanskrit and classical literature** a renewed life.

- He cited creators and digital initiatives popularizing Sanskrit phrases and songs, showing that *Vande Mataram* continues to **inspire modern generations**.
- The **150th year celebration** (November 2025–November 2026) marks not just a remembrance of India's past but a **reaffirmation of cultural pride and**

linguistic heritage.

Conclusion:

- *Vande Mataram* remains more than a song – it is a **symbol of India's cultural unity, spiritual nationalism, and collective struggle for freedom.**

