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JANUARY 2025 MAGAZINE



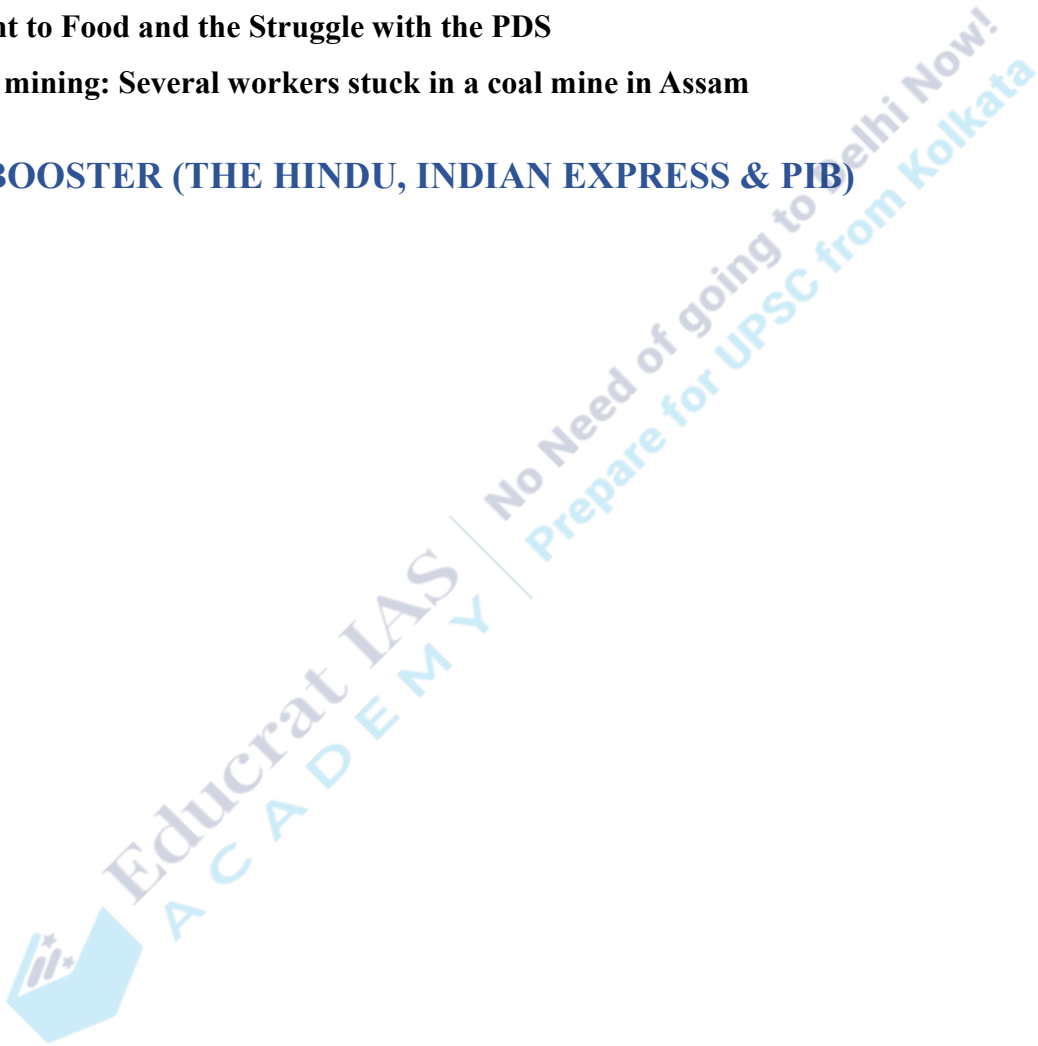
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## Mains Daily Analysis

### General Studies I

#### 1. The Copyright Conundrum in Carnatic Music

##### Context

- **Carnatic music**, an ancient and revered form of Indian classical music, **has long existed outside the strict boundaries of copyright law.**
- This **exclusion is due to both historical factors and the unique nature of Carnatic music**, which emphasises improvisation and oral tradition.
- However, **as the recent Margazhi music season in Chennai demonstrated, copyright concerns are becoming increasingly relevant.**
- The **existing legal framework does not adequately protect performers**, raising pressing questions about whether the law should evolve to reflect the realities of Indian classical music.

##### The Legal Dilemma: Copyright and Carnatic Music

- **A Unique Dilemma**
  - The **relationship between copyright law and Carnatic music presents a unique dilemma that stems from the nature of classical compositions**, the role of improvisation, and the historical context of Indian copyright legislation.
  - Unlike Western classical music, which relies heavily on written scores, **Carnatic music is primarily an oral tradition, passed down from teacher to student** over generations.
  - This **fundamental difference raises complex legal questions** about how intellectual property rights should apply to an art form that thrives on fluidity and creative reinterpretation.
- **The Western Influence on Indian Copyright Law**
  - **Copyright law in India, originally enacted in 1914** during British rule, was influenced by Western legal frameworks, particularly British copyright law.
  - The **legislation, which was revised in 1957, continued to operate under the assumption that music is a composition** that can be reduced to written notation.
  - This **perspective is aligned with the Western classical tradition**, where composers write detailed scores specifying every note, dynamic, and articulation.
  - The **role of a performer in Western classical music is often to faithfully interpret these compositions** rather than to improvise or innovate.
- **The Challenges of Implementation of Copyright Law in Carnatic Music**
  - **Carnatic music, by contrast, does not function in the same way**, while written notation exists, it serves only as a skeletal framework for a composition.
  - The **essence of Carnatic music lies in its improvisatory aspects**, manodharma sangeetam, which includes raga alapana (melodic improvisation), neraval (improvised elaboration of a phrase), and kalpana swaras (spontaneous note sequences).
  - **Because these elements are not fixed in writing, they do not fit neatly into the legal definition** of a 'musical work' under copyright law.
  - This raises the fundamental question: **Should copyright law define music based on a Western understanding, or should it evolve to accommodate non-Western traditions like Carnatic music?**

##### The Public Domain and the Question of Improvisation



- One of the major reasons Carnatic music has remained outside mainstream copyright discussions is that **most of its foundational compositions belong to the public domain.**
- The **works of composers such as Tyagaraja, Purandara Dasa, and Gopalakrishna Bharati were created before copyright laws existed,** meaning their compositions are freely available for anyone to perform.
- However, **Carnatic musicians do not merely reproduce these compositions—they reinterpret them,** often introducing complex improvisations and personal stylistic touches.
- **These additions, while artistically significant, do not currently receive copyright protection.** This leads to several critical legal questions:
  - If a musician improvises a section of a song, **does that improvisation qualify as a new, copyrightable work?**
  - If a performer reinterprets a composition **by changing its raga or tempo, should they have rights over that specific rendition?**
  - **Should a performer's unique style,** such as Madurai Mani Iyer's distinctive approach to **Eppo Varuvaro, be considered an intellectual property right?**

#### Existing Copyright Protections and Their Limitations

- **Composer and Lyricist Rights**
  - The **composer and lyricist of a song receive copyright protection for their lifetime plus 60 years.**
  - This **ensures that their work cannot be commercially exploited** without permission.
  - However, **in the case of Carnatic music, most compositions by great composers** like Tyagaraja, Muddusvami Dikshitar, and Shyama Shastri **are already in the public domain, meaning anyone can perform** or record them without seeking permission.
- **Mechanical Rights (Rights Over Sound Recordings)**
  - **When a song is recorded onto a tangible medium,** such as an audio CD or a digital file, **the entity that records the song (such as a record label or an individual artist) gains mechanical rights** over that specific recording for 60 years.
  - **While this provides some form of protection, it does not extend to live performances** where improvisation plays a significant role.
- **Performers' Rights**
  - **Performers, including singers and instrumentalists, have the right to prevent unauthorised recordings of their performances.**
  - This is particularly relevant for live concerts, where artists might not wish their music to be recorded and distributed without consent.
  - In theory, **performers should also be entitled to royalties from streams or sales of their music.**

#### The Need for Legal Reform

- The **spontaneous nature of Carnatic improvisation complicates its protection** under existing copyright laws.
- Unlike compositions that are formally documented, **improvisations are often ephemeral, making it difficult to claim ownership.**
- Yet, **the contributions of performers should not be overlooked.** Musicians should have the right to commercially benefit from their unique interpretations, just as composers and lyricists do.

#### Necessary Measures Towards a More Inclusive Framework

- **Recognising Improvisation as Intellectual Property:** Laws should account for original variations and improvisations in a performance, granting musicians limited rights over their unique contributions.
- **Stronger Performers' Rights**
  - Existing laws on performers' rights should be enforced, **ensuring that artists can control and monetise recordings of their concerts.**
  - Unauthorised uploads to streaming platforms should be subject to stricter penalties.
- **Fair Royalty Distribution**



- Streaming services and concert venues **should be required to compensate artists for performances.**
- The royalty flow from digital platforms should be strengthened, **ensuring that musicians benefit financially from their work.**

### Conclusion

- **The current copyright framework in India does not reflect the realities of Carnatic music,** leaving performers vulnerable to exploitation.
- While classical compositions are in the public domain, **the creativity infused into their rendition deserves recognition and protection.**
- Instead of forcing music to fit outdated legal definitions, **copyright law should evolve to safeguard the rights of musicians.**
- **By reforming copyright laws** to include improvisation and strengthening performers' rights, **India can ensure that Carnatic musicians receive the recognition and financial security** they deserve.

## 2. Denotified Tribes Classification: A Step Towards Social Justice

### Why in the News?

- After three years of research, **the Anthropological Survey of India (AnSI)** and Tribal Research Institutes (TRIs) have for the first time systematically categorized **268 denotified, semi-nomadic, and nomadic tribes across India.**

### Historical Background and the Need for Classification:

- Denotified tribes were once labelled as "criminal" under the **Criminal Tribes Act of 1924, which was repealed in 1949.**
- However, since then, various commissions—including the **Kaka Kalelkar Commission (1955), the Mandal Commission (1980), the Renke Commission (2008), and the Idate Commission (2017)**—have attempted but failed to fully classify these communities.
- The **Idate Commission's 2017 report identified 1,200 denotified, semi-nomadic, and nomadic tribes** and highlighted 267 unclassified communities.
- This led the Indian government to form a Special Committee under the NITI Aayog in 2019, which assigned **AnSI and TRIs the task of ethnographic classification.**

### Key Findings of the Study:

- **268 communities classified:** For the first time, these tribes have been systematically documented.
- **179 communities recommended for SC/ST/OBC inclusion:** This inclusion aims to provide reservation benefits.
- **63 communities found untraceable:** These groups may have merged with other communities, changed names, or migrated.
- **Political and legal implications:** The classification has sparked debates on reservations and special status.

### Impact on Reservation and Welfare Policies:

- With this classification, **denotified tribes could access government welfare schemes reserved for SCs, STs, and OBCs, including education and employment opportunities.**
- However, this move has also raised political concerns.
- There are two competing views within the **Development and Welfare Board for Denotified, Nomadic, and Semi-Nomadic Communities:**
- **Support for Inclusion in SC/ST/OBC Lists**
  - Ensures access to **education, jobs, and social welfare schemes.**
  - Provides **legal recognition and identity to these communities.**
- **Demand for a Separate Reservation Category**



- Advocates argue that denotified tribes should have their own classification, similar to SCs and STs, rather than being merged into existing categories.
- Some fear that merging them into SC/ST/OBC groups might dilute reservation benefits for other communities.

#### Challenges and Concerns:

- **Political Controversies:** Activists in states like **Uttar Pradesh, Haryana, Madhya Pradesh, and Gujarat** are questioning the basis of classification, fearing it may impact existing reservation structures.
- **Delays in Implementation:** Despite multiple commissions advocating for classification, government action has been slow, delaying welfare benefits.
- **Historical Misclassification:** Earlier census data mistakenly categorized some tribes as castes, creating confusion over their identity and legal status.

#### Way Forward:

- The AnSI and TRIs have submitted their final report to the Special Committee under the NITI Aayog.
- Currently, the committee is reviewing recommendations before preparing a final report for the government.
- **If the recommendations are accepted:**
  - **State governments** will have an easier pathway to include these tribes in reservation lists.
  - New welfare policies could be introduced to **address socio-economic inequalities** faced by these communities.
  - The debate on creating a **separate category for denotified tribes may gain momentum.**

#### Conclusion:

- The classification of denotified, semi-nomadic, and nomadic tribes is a crucial step toward rectifying historical injustices and ensuring their access to government welfare schemes.
- However, the implementation process remains complex, with **political and legal challenges** ahead.
- The government's final decision on this matter will shape the socio-political landscape of reservation policies in India.

### 3. Crosspathy in India

#### Why in the News?

The **Maharashtra Food & Drugs Administration** has, in a recent directive, allowed homeopathic practitioners, who have completed a certificate course in **modern pharmacology, to prescribe allopathic medications.**

#### What's in Today's Article?

- Crosspathy (Meaning, Legal & Regulatory Framework, Reasons, Challenges, etc.)
- News Summary (Context, Controversy, Implications, etc.)

#### Crosspathy in India:

- Crosspathy refers to the practice where **medical practitioners trained in one system of medicine (e.g., Ayurveda, Homeopathy, or Unani) prescribe medicines or perform treatments from another system (primarily Allopathy, or modern medicine).**
- This practice is a significant issue in India's healthcare sector due to its implications for **patient safety, legal frameworks, and medical ethics.**

#### Legal and Regulatory Framework:

- **Permissibility:**
  - Crosspathy is **generally deemed illegal** unless explicitly authorized by state laws or special government orders.
- **Judicial Rulings:**



- The Supreme Court of India has ruled that practicing medicine outside one's expertise without explicit authorization amounts to **medical negligence**.
- Crosspathy practitioners have faced legal actions under the Indian Medical Council Act and other state-specific medical laws.

#### Reasons Behind Crosspathy in India:

- **Doctor Shortages:**
  - India faces a critical shortage of allopathic doctors, especially in rural areas, with an **80% shortfall of specialists in Community Health Centres (CHCs) as of 2022-23**.
  - **AYUSH (Ayurveda, Yoga, Unani, Siddha, Homeopathy) practitioners** are often utilized to fill this gap.
- **Policy Gaps:**
  - Some states have allowed limited crosspathy to address **accessibility challenges, such as in Maharashtra and Goa**.
- **Economic Factors:**
  - Patients in rural areas often cannot afford specialist doctors or urban healthcare facilities, making AYUSH practitioners a more accessible option.

#### Challenges & Criticism:

- **Patient Safety:**
  - Crosspathy practitioners **may lack comprehensive training in modern medicine**, increasing risks of incorrect diagnoses, improper prescriptions, and complications.
- **Legal Ambiguity:**
  - Conflicting laws and court rulings create confusion about what constitutes permissible crosspathy.
  - Regulatory oversight is often weak, particularly in rural areas.
- **Professional Conflicts:**
  - The **Indian Medical Association (IMA) strongly opposes crosspathy, citing it as a dilution of healthcare standards**.

#### News Summary:

- The Maharashtra Food & Drugs Administration (FDA) has permitted homeopathic practitioners with a certificate in modern pharmacology to prescribe allopathic medicines.
- This move aims to **address challenges in healthcare delivery but has invited strong opposition from the Indian Medical Association (IMA) and others**.

#### Background of the Directive:

- In **2014, the Maharashtra government redefined "registered medical practitioner"** under the Maharashtra Medical Council Act to include certified homeopathic practitioners.
- A directive in late 2024 clarified that chemists must honour prescriptions by these practitioners, resolving confusion regarding their authority.

#### Controversies Surrounding Prescriptions:

- **IMA's Opposition:**
  - The IMA labelled the move as **"crosspathy," stating it undermines patient safety**.
  - Critics argue that a short pharmacology course cannot substitute for the rigorous MBBS training required for modern medicine.
- **Judicial Challenges:**
  - A **2017 notification permitting homeopaths to practice allopathy was stayed by the Bombay High Court**. The new directive contradicts this ruling.





- Past Supreme Court rulings have labelled cross-system practice as medical negligence unless explicitly authorized.

#### Government's Rationale:

- The **directive aims to address India's acute shortage of doctors, particularly in rural areas.** According to a 2022-23 report, there is an 80% shortfall of specialist doctors in rural health centres.
- With over **13 lakh registered allopathic doctors and 5.65 lakh AYUSH practitioners**, the government seeks to utilize alternative practitioners to bridge healthcare gaps.

#### Implications for the Move:

- **For Patients:**
  - Concerns about the **safety and efficacy of treatments** prescribed by non-MBBS practitioners.
  - **Potential risks of medical negligence** in rural and underserved areas.
- **For the Healthcare System:**
  - Challenges in **regulating prescribing practices, particularly in rural settings.**
  - Dilution of general practice standards, potentially weakening India's already strained healthcare infrastructure.
- **For Policy and Governance:**
  - Highlights the urgent need for structural reforms, better rural incentives, and improved working conditions for MBBS graduates.

#### Conclusion:

Maharashtra's directive represents a critical juncture in healthcare policy. While the intention to bridge healthcare gaps is commendable, the implementation raises ethical, legal, and practical questions.

Resolving these challenges requires a balanced approach that prioritizes **patient safety, respects medical standards, and addresses workforce shortages sustainably.**

## 4. India's Roadmap to a Healthy Nation by 2047

#### Why in News?

India's aspiration to become an economically developed nation (**Viksit Bharat**) by 2047 hinges on the **health and productivity of its population.**

To achieve this, **robust health systems must emerge by 2025**, prioritizing prevention, equitable treatment, and the integration of digital solutions.

#### Key Pillars for a Healthy India:

- **Universal Health Coverage (UHC) through primary healthcare:**
  - **Financial and service goals:** UHC aims to ensure financial protection and extensive service coverage.
  - **Resource allocation:** Higher public financing is essential, with a focus on central and state budgets.
  - **Health workforce:** Immediate efforts must address the shortage of highly skilled doctors by training technology-enabled frontline workers and allied health professionals.
- **Ayushman Bharat as a template for transformation:** Key components -
  - **Upgraded primary care architecture.**
  - Financial protection for vulnerable groups.
  - Enhanced health infrastructure.
  - **Integration through digital health technology.**
- **Digital Health Mission:** Vital for epidemiological intelligence, programme monitoring, and system integration.

#### Data-Driven Decision-Making for a Healthy India:

- **Disaggregated and integrated data systems:**
  - **Local-level insights:** Data must be available at district and block levels for informed, resource-efficient, and equity-driven actions.
  - **Epidemiological transition:**
    - Rising burden of **non-communicable diseases** (NCDs) and mental health disorders requires accurate tracking of trends and risk factors.
    - While the integrated disease surveillance programme (**IDSP**) provides data on some infectious diseases through sentinel sites, **the rapid rise in zoonotic diseases calls for extensive and real-time surveillance data.**
- **Advanced surveillance systems:**
  - **Infectious diseases:** Real-time surveillance for infectious diseases, including zoonotic threats. **Big data analytics** will need to be at the heart of infectious disease surveillance.
  - **Techniques: Wastewater surveillance and antimicrobial resistance (AMR)** monitoring must become routine.
  - **One Health Approach:** Integration of data across human, animal, and environmental health systems to tackle climate-related health threats.

#### **Digitally Integrated Healthcare for a Healthy India:**

- **Patient-centered data systems:**
  - **Interoperability:** Diagnostic and treatment data must be accessible across healthcare facilities.
  - **Challenges:** Lack of private sector integration disrupts continuity of care.
- **Public-private collaboration:**
  - **Bridging gaps:** Digital systems must connect primary care and publicly funded health insurance programmes that **support secondary and tertiary hospital care (like PMJAY and state health insurance programmes).**
    - This will integrate public and private health data repositories.
  - **AI-driven insights:** Application of artificial intelligence to Indian health data can enhance diagnostics and clinical management.
- **Community participation:** Digital tools can enable **crowdsourcing for outbreak surveillance** and address programme implementation issues.

#### **Conclusion:**

- India's journey toward a healthy and productive population by **2047** requires **immediate and sustained efforts.**
- By 2025, a **digitally integrated, data-driven, and universally accessible healthcare system must take root, propelling the nation toward its health goals.**

## **5. Why Are Fertility Levels Declining in India?**

#### **Introduction:**

- A global demographic analysis conducted by the **Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2021** highlights a significant decline in fertility levels worldwide, including in India.
- The report reveals a dramatic drop in India's **Total Fertility Rate (TFR)** from **6.18 in the 1950s** to **1.9 in 2021**, below the replacement level of 2.1.
- Projections suggest this rate could fall to **1.04 by 2100**, signalling major socio-economic implications.

#### **Reasons for Declining Fertility in India:**

- **Increased Female Literacy and Workforce Participation:**
  - **Women's empowerment and higher educational attainment** have contributed significantly to the decline in fertility rates.
- **Changing Societal Attitudes:**



- **Late marriages or choosing not to marry** are becoming more common as women prioritize careers and financial independence over traditional roles.
- **Infertility and Abortions:**
  - **Rising rates of infertility in men and women** and increased abortion rates are also contributing factors.
- **Migration:**
  - Many young individuals move abroad for **higher education and employment**, often settling there and raising families outside India.
- **Urbanization and Modern Aspirations:**
  - With urbanization, families are opting for fewer children to maintain economic and social aspirations.

#### **Regional Implications:**

- **Southern States**
  - **Kerala** and other southern states witnessed demographic transitions earlier than the rest of India, achieving **replacement-level fertility in the late 20th century**.
  - **Challenges include:**
    - **Ageing Population:** The elderly population is rapidly increasing, surpassing the younger demographic.
    - **Shrinking Workforce:** Youth migration for better prospects has left gaps in the local labor market.
    - **Healthcare Demands:** There is an increased burden on healthcare systems and social security to support the elderly.
- **Kerala's Specific Case:**
  - **Labour Market: High labor wages and quality of life** attract migrant workers from other states, making up about **one-sixth** of the population by 2030.
  - **Health Challenges: Delayed motherhood leads to older mothers and higher pregnancy-related morbidities.**

#### **Global Context:**

- Countries like **South Korea** showcase the challenges of reversing fertility declines.
- Despite heavy investments in pro-natalist policies, South Korea's fertility rate fell from **0.78 in 2022** to **0.73 in 2023**, underscoring the difficulty of reversing demographic trends once they set in.

#### **Future Implications for India:**

- **Economic Impacts:**
  - A **shrinking workforce** may hinder economic growth.
  - Increased **healthcare costs due to the ageing population**.
- **Social Challenges:**
  - Rising dependency ratios could strain families and welfare systems.
  - **Reduced innovation and productivity** due to fewer young workers.

#### **Way Forward:**

- **Socio-Economic Policies:**
  - Policies focusing on **economic growth, job creation, and support for the youth** can help mitigate the effects of declining fertility rates.
- **Leveraging the Elderly Population:**
  - Tap into the potential of senior citizens through **skill development and involvement in economic activities**.
- **Support for Families:**
  - Provide incentives for young couples to have children, such as **tax benefits, childcare support, and housing subsidies**.

#### **Conclusion:**

- India's declining fertility rates signal a demographic shift with **long-term socio-economic implications**.



- Proactive policies that address **economic, healthcare, and social challenges** are crucial to adapting to this transformation.
- Learning from global experiences and focusing on sustainable development will ensure that India navigates these challenges effectively.

## 6. Understanding India's Natural Catastrophe Risks and Economic Impacts

### Background:

- India has witnessed a sharp rise in economic losses due to **natural catastrophes, reflecting both the increasing frequency of extreme weather events and the country's vulnerabilities.**
- In 2023, natural disasters caused an estimated **\$12 billion** in economic losses, significantly exceeding the annual average of **\$8 billion** over the past decade, according to a report by global insurance giant **Swiss Re.**

### Key Events in 2023:

- **Floods in Northern India and Sikkim (July 2023):**
  - **Affected Areas:** Himachal Pradesh, including Shimla, and Delhi.
  - **Impact:** Caused extensive damage due to heavy rains between **July 10-15**, disrupting daily life and infrastructure.
- **Tropical Cyclone Biparjoy (June 2023):**
  - **Landfall:** Category 3 cyclone struck **Kutch, Gujarat, impacting Maharashtra and Rajasthan as well.**
  - **Damage:** Shut down major ports like Kandla and Mundra, causing extensive damage due to strong winds, heavy rainfall, and storm surges.
- **Tropical Cyclone Michaung (December 2023):**
  - **Landfall:** Hit Chennai, Tamil Nadu.
  - **Impact:** Brought extreme rainfall, resulting in significant economic losses and urban disruption.

### India's Unique Vulnerabilities:

- **Monsoon-Driven Floods:**
  - **Contribution to Losses:** Over the past two decades, floods have accounted for an average of **63%** of annual economic losses.
- **Monsoon Influence:** India's geography and climate expose it to heavy rainfall during:
  - **Summer Monsoon (June-September):** Causes severe flooding, as seen in Kerala (2018) and Uttarakhand (2013).
  - **Northeast Monsoon (October-December):** Responsible for floods like Chennai (2015).
- **Economic and Industrial Exposure:**
  - States like **Gujarat, Maharashtra, and Tamil Nadu** are highly industrialized, contributing **36.8%** of India's total industrial output. These states also face heightened risks:
    - **Gujarat:** Prone to floods, tropical cyclones, and earthquakes.
    - **Maharashtra:** Susceptible to floods and cyclones, especially in Mumbai.
    - **Tamil Nadu:** Regularly impacted by monsoon floods and cyclones, particularly in Chennai.

### Earthquake Risks:

- Urban centres like **Delhi** and **Ahmedabad** face significant earthquake hazards.
- A major earthquake in the **Himalayas** or near urban centres like Mumbai could result in catastrophic losses, potentially surpassing the devastation caused by the **2001 Bhuj earthquake** in Gujarat.

### Challenges in Resilience and Insurance:

- Despite the scale of economic losses, **underinsurance** remains a critical issue:



- **Protection Gaps:** Over **90%** of households and businesses are under- or uninsured, leaving them financially vulnerable.
- **Costliest Flood Events:**
  - **Mumbai floods (2005):** Losses of **\$5.3 billion** (2024 prices)
  - **Chennai floods (2015):** Losses of **\$6.6 billion** (2024 prices)

### **Building Resilience: A Three-Step Approach**

- Swiss Re outlines a strategic framework to address underinsurance and reduce the impact of natural catastrophes:
  - **Hotspot Identification:**
    - Identify regions most prone to disasters using granular data.
    - Prioritize mitigation measures in high-risk areas like Ahmedabad, Mumbai, and Chennai.
  - **Risk Assessment:**
    - Employ **advanced models to assess potential exposure and risk accumulation.**
    - Incorporate recent and detailed data for accurate evaluations.
  - **Reinsurance Solutions:**
    - Design **targeted reinsurance programs to close protection gaps.**
    - Promote affordable insurance coverage for households and businesses.

### **Conclusion:**

- India's rapid economic growth has outpaced its ability to mitigate the vulnerabilities posed by natural catastrophes.
- The increasing frequency of extreme weather events highlights the urgent need for robust disaster preparedness, improved **insurance penetration, and strategic resilience-building measures.**
- By addressing these challenges, India can better safeguard its economy and citizens from the mounting risks of natural disasters.

## **7. Transforming 'Men'-Talities, Redefining Masculinity**

### **Context**

- The **International Day for the Elimination of Violence Against Women** (November 25) serves as a **sombre reminder of the persistent global issue** of gender-based violence.
- Despite decades of advocacy, **nearly one in three women worldwide has suffered violence at the hands of men.**
- This **alarming statistic highlights the need to engage men not just as perpetrators but also as key agents of change** in combating violence against women.

### **The Root Causes of Violence Against Women and Progress in Engaging Men**

- **Early Socialisation and Harmful Expectations**
  - In many societies, **boys are raised with messages that equate masculinity with authority and control.**
  - Common **phrases such as 'boys don't cry' and 'man up' suppress emotional expression,** forcing boys to internalise their feelings.
  - This **emotional suppression often manifests as frustration, aggression, or a lack of emotional intelligence,** which can harm their relationships and mental health.
  - **Boys are also taught to associate strength with dominance,** leading to a perception that they must assert control over others, often women, to affirm their masculinity.
  - These **societal messages are reinforced by gendered expectations** in families.
  - For example, **boys may observe that household decision-making and outdoor activities are reserved for men,** while caregiving and domestic chores are deemed women's responsibilities.
- **Toxic Masculinity**



- **Toxic masculinity**, a term used to describe harmful behaviours and attitudes **associated with traditional male roles, further compounds the problem.**
- It **emphasises aggression, competition, and dominance**, which are often expressed in harmful ways.
- **Men conditioned by these norms may resort to violence to assert control** or resolve conflicts, especially in situations where their authority feels challenged.
- This is a **critical factor in domestic violence** and other forms of gender-based violence.
- **Toxic masculinity also affects men themselves**, trapping them in cycles of emotional isolation and destructive behaviour.
- The **inability to express vulnerability can lead to poor mental health outcomes**, including anxiety, depression, and substance abuse.
- **The Role of Media and Cultural Narratives**
  - **Films, advertisements, and popular culture frequently portray men as aggressive protectors** or stoic providers, while women are depicted as passive caregivers or victims.
  - Such representations **reinforce binary gender roles** and discourage deviation from these norms.
  - **Boys who consume these narratives often aspire to embody these stereotypical ideals**, further entrenching toxic masculinity.
  - In some cultures, religious or traditional beliefs may also reinforce harmful gender norms.
- **Progress in Engaging Men**
  - In recent years, **the development sector has increasingly focused on the role of men and masculinities in achieving gender equality.**
  - **Academic research and grassroots efforts have highlighted effective strategies** for engaging men in challenging traditional gender norms.
  - **These initiatives reveal a growing willingness among men to contribute to gender equality**, not as passive allies but as active participants in social transformation.

#### **Case Study: India's Approach to Gender Equality**

- **UNESCO's Transforming MENTalities Initiative**
  - UNESCO's Transforming MENTalities initiative **stands out as a comprehensive effort to address the root causes of gender inequality** by engaging men and boys.
  - Rather than treating them solely as allies in the fight for gender equality, **this initiative positions them as active participants in social transformation.**
  - **By dismantling rigid and harmful ideas of masculinity**, it encourages men to adopt positive, supportive roles within their families and communities.
  - As part of this initiative, **UNESCO partnered with the International Centre for Research on Women (ICRW) to produce the report Engaging Men and Boys: A Report on Pathways to Gender Equality in India.**
  - This report documents **pioneering programs that have successfully engaged men and boys in addressing gender biases**, fostering equitable attitudes, and creating sustainable change.

#### **Pioneering Programs and their Impact**

- **Mardon Wali Baat (A Man's Thing)**
  - **Run by The YP Foundation**, this initiative uses **storytelling and social media to engage young men** on college campuses and in communities.
  - It **encourages participants to critically examine societal narratives** around masculinity, such as equating strength with dominance, and to embrace values of respect, equality, and emotional openness.
  - **By creating conversations on positive masculinities**, this program equips young men to **challenge stereotypes** in their personal lives and communities.
- **Gender Equity Movement in Schools (GEMS)**
  - A **collaboration between ICRW and the Rajasthan Department of Education**, GEMS works with adolescents to address toxic masculinity through interactive classroom activities.



- By focusing on critical discussions, **the program helps boys understand the harm caused by traditional gender roles** and encourages them to adopt equitable attitudes.
- One transformative moment occurred when a boy reflected, **“I used to think boys should only do outdoor chores. Now, I believe we should work alongside women at home.”**
- These insights have a ripple effect, influencing not only the boys themselves but also their families and peers.
- **Dekh Rekha (Caring for Each Other) and Hamari Shaadi (Our Marriage)**
- These programs **focus on engaging men in household and familial responsibilities**, such as family planning and nutrition.
- By encouraging men to take active roles in domestic spheres traditionally dominated by women, **these initiatives challenge deeply rooted gender biases and promote equality through everyday actions.**

### The Way Forward

- **Reshaping Norms to Address Root Causes**
  - **Early education is essential** to dismantling stereotypes, teaching boys that vulnerability, empathy, and equality are strengths, not weaknesses.
  - **Families, schools, and communities must model and promote alternative**, healthier definitions of masculinity.
  - **Public campaigns, media representations, and positive role models can further reinforce these messages** by showing that masculinity can coexist with emotional openness, partnership, and respect for women.
- **Community-Driven Approaches**
  - **The success** of these programs **lies in their community-driven approach.**
  - **By integrating local contexts and cultural nuances**, these initiatives resonate with participants and develop grassroots ownership of gender equality efforts.
  - For example, **interactive sessions, storytelling, and role-playing activities are used to make complex ideas accessible and relatable.**
  - Moreover, engaging men and boys within their own social environments ensures that change is not imposed from the outside but emerges organically, making it more sustainable.

### Conclusion

- As we move forward, **let us celebrate the men and boys who are challenging traditional masculinities and championing equality.**
- **By redefining what it means to ‘be a man,’ we can create a world where everyone, regardless of gender, is free from violence** and empowered to thrive.
- **Together, through education, advocacy, and collective action**, the violence against women can be eliminated and we can build a more just and equitable society.

## 8. Kumbh Mela Explained

### Why in news?

The Maha Kumbh 2025, a grand religious event held every **12 years, will take place in Prayagraj, starting on January 13, with the first holy bath (snan).**

Expected to attract over 45 crore devotees over one-and-a-half months, it is one of the **largest gatherings on earth.** While its exact origins are debated—some tracing it to the **Vedas and Puranas** and others to the past two centuries—it remains a significant spiritual and cultural festival.

### The Kumbh Mela

- **Origin**
  - The Sanskrit word **"kumbh"** means **pitcher or pot.**



- According to mythology, during the ocean churning by **Devas (gods) and Asuras (demons)**, **Dhanvantri emerged with a pitcher of amrita (elixir of immortality)**.
- To prevent Asuras from getting it, **Jayant, Indra's son, fled with the pot, protected by the Sun, Shani, Brihaspati (Jupiter), and the Moon**.
- As Jayant ran for 12 divine days (equal to 12 human years), amrita spilled at four locations: **Haridwar, Prayagraj, Ujjain, and Nashik-Trimbakeshwar**.
- **Frequency**
  - **Maha Kumbh (Poorna Kumbh)**: Held every 12 years.
  - **Ardh-Kumbh**: Held in Prayagraj and Haridwar every 6 years.
- **Significance of the Rivers**
  - **The festivals occur on the banks of sacred rivers:**
    - **Haridwar**: Ganga
    - **Prayagraj**: Confluence of Ganga, Yamuna, and mythical Saraswati
    - **Ujjain**: Kshipra (believed to emerge from Vishnu's heart in his Varah avatar)
    - **Nashik-Trimbakeshwar**: Godavari (known as the Ganga of the south)
  - Bathing in these rivers during Kumbh, under specific celestial alignments, is believed to cleanse sins and provide spiritual merit (punya).
- **Gathering of Sadhus and Spiritual Learning**
  - Kumbh Melas attract Sadhus and holy men, especially from the akhadas, providing opportunities for devotees to meet and learn from them.

#### **Astrological Basis of Kumbh Mela**

- The site of a Kumbh Mela is determined by astrological calculations based on the **positions of Jupiter, the Sun, and the Moon**.
- Jupiter's 12-year revolution around the Sun also explains the 12-year gap between Kumbh Melas.
- Astrological alignments unique to each site guide the timing and location of the Kumbh Mela.

#### **Historical References to Kumbh Mela**

- **Ancient References to Kumbh Mela**
  - The **Skanda Purana** is often cited as proof of Kumbh Mela's antiquity, but no extant version explicitly describes the festival as we know it.
    - The Samudra Manthan story, though mentioned in various scriptures, lacks references to the spilling of amrita at four places.
  - Some claim the Rig Veda includes shlokas highlighting the benefits of participating in the Kumbh Mela.
- **Xuanzang's Account**
  - The **Chinese pilgrim Xuanzang** described a **seventh-century fair in Prayag**, but it is unclear whether it was the Kumbh Mela.
  - **Kama Maclean suggests that an ancient bathing festival, Magh Mela, held at Prayag was rebranded as the "timeless" Kumbh after 1857 to avoid British interference.**
- **Adi Shankaracharya's Role**
  - The 8th-century philosopher **Adi Shankaracharya is believed to have formalized the four periodic fairs**, creating opportunities for Hindu ascetics and scholars to gather and guide the public.
- **Evolution of Kumbh Mela**
  - According to some experts, the **Kumbh Mela likely began at Haridwar, as Brihaspati (Jupiter) in Kumbh rashi corresponds to this site**.
  - The tradition possibly took shape after the 12th century CE during the Bhakti movement, as fairs on sacred riverbanks are an ancient Hindu tradition.
  - They link the Kumbh's origins to Ganga worship and the influence of travelling sadhus, who spread the idea of holding Kumbh Melas at four sacred rivers.





- **Historical Records**

- Mughal-era records and those kept by sanyasi akhadas indicate the **Kumbh Mela was formalized over time, evolving into a major socio-religious event.**
- These gatherings provided opportunities for ascetics to earn followers and for pilgrims to engage in spiritual practices.

**How Kumbh Mela became a platform for nationalism during Independence movement?**

- **Allahabad's Rise as a Political and Cultural Hub**

- Following the 1857 revolt, **Allahabad became the capital of the North-Western Provinces, gaining prominence as a political and administrative center.**
- With institutions like the **High Court (1867) and Allahabad University (1887)**, the city attracted influential families, students, and nationalists.
- By the late 19th century, Allahabad had transformed into a significant site for political and religious activities, including the Kumbh Mela.

- **Religious Festivals as a Platform for Nationalism**

- From the late 19th century, the **Kumbh Mela evolved into a platform for disseminating nationalist ideas.**
- The British policy of non-interference in religion allowed Indian leaders to leverage religious gatherings for political purposes.
- By the 1900s, nationalist leaders like **Bal Gangadhar Tilak and Gopal Krishna Gokhale used the Kumbh to promote Swadeshi and other nationalist causes.**

- **The Role of Congress and Religious Leaders**

- By the **1930s, the Congress Party actively used Kumbh Melas for political mobilization.**
- Sadhus and ascetics played a key role in spreading nationalist messages, blending religious authority with Congress policies.
- Events like the 1936 **Ardh Kumbh saw displays such as the idol of Bharat Mata** and political processions that aligned spiritual and nationalist sentiments.

- **Conclusion**

- The Kumbh Mela evolved from a **regional religious gathering to a significant national event with political undertones, especially during the Indian freedom struggle.**
- Its transformation was influenced by nationalist leaders, local priests, and ascetics, who used it as a stage for resistance against colonial rule and the assertion of India's political sovereignty.

## 9. Groundwater contamination in India

### Why in news?

An assessment of India's groundwater by the Central Ground Water Board (CGWB) found that several States are grappling with a serious problem of nitrate contamination.

### Excessive Nitrate in Groundwater: A Growing Concern

- **Increase in Nitrate-Contaminated Districts**

- The number of districts with excessive nitrate in groundwater increased from **359 in 2017 to 440 in 2023**, impacting nearly **56% of India's districts.**
- Excessive nitrate levels are defined as concentrations above **45 mg/l.**

- **Groundwater Testing and Trends**

- **2017 Findings:** 13,028 samples were analyzed, with **21.6%** showing excessive nitrate levels.
- **2023 Findings:** Of 15,239 samples tested, **19.8%** had nitrate levels above safe limits.



- While the percentage of affected samples has not substantially changed, the number of contaminated districts has risen.
- **Health Concerns**
  - Excessive nitrate in groundwater causes **methemoglobinemia**, reducing the ability of red blood cells to carry oxygen, particularly affecting infants and vulnerable populations.
- **Environmental Impact**
  - Elevated nitrate levels in groundwater can lead to **algal blooms** in lakes and ponds, severely degrading aquatic ecosystems by depleting oxygen and harming biodiversity.
- **Sources of Nitrate Contamination**
  - **Agricultural Practices:** Farmers use fertilizers such as **ammonium nitrate, calcium nitrate, urea, and diammonium hydrogen phosphate**, leading to nitrogen leaching into groundwater.
- **Forms of Dissolved Nitrogen in Groundwater:**
  - **Nitrate (NO<sub>3</sub>-)**
  - **Ammonium (NH<sub>4</sub><sup>+</sup>)**
  - **Ammonia (NH<sub>3</sub>)**
  - **Nitrite (NO<sub>2</sub>-)**
  - **Nitrogen gas (N<sub>2</sub>)**
  - **Nitrous oxide (N<sub>2</sub>O)**
  - **Organic nitrogen**

#### Regional Analysis of Nitrate Contamination in Groundwater

- **States with the Highest Proportion of Contaminated Blocks**
  - **Rajasthan:** 49% of tested samples exceeded permissible nitrate levels.
  - **Karnataka:** 48% of tested samples were contaminated.
  - **Tamil Nadu:** 37% of tested samples showed excessive nitrate levels.
- **States with Persistent Nitrate Issues**
  - **Rajasthan, Madhya Pradesh, and Gujarat:** These states have had a **long-standing nitrate problem** with contamination levels remaining relatively constant since 2017.
- **Emerging Nitrate Concerns in Central and Southern India**
  - Increasing nitrate contamination has been observed in blocks in **central and southern India**, raising alarm.
  - States with notable levels of contamination:
    - **Maharashtra:** 35.74%
    - **Telangana:** 27.48%
    - **Andhra Pradesh:** 23.5%
    - **Madhya Pradesh:** 22.58%

#### Other Major Chemical Contaminants in Groundwater

- **Key Contaminants**
  - **Arsenic, Iron, Fluoride, and Uranium:** These chemicals significantly affect groundwater quality alongside nitrate contamination.
  - **Fluoride Contamination:** 9.04% of tested groundwater samples had fluoride levels exceeding the permissible limit.
    - **High-Risk States: Rajasthan, Haryana, Karnataka, Andhra Pradesh, and Telangana** reported high fluoride concentrations, making it a “major concern.”
  - **Uranium Contamination:** Several samples had uranium concentrations exceeding 100 ppb (parts per billion), far above the safe limit of 30 ppb.
    - **High-Risk States:** Rajasthan and Punjab reported the maximum number of contaminated samples. Other affected states include Gujarat, Haryana, Tamil Nadu, Andhra Pradesh, and Karnataka.
- **Cause**



- Predominantly observed in regions with **over-exploited groundwater (where water withdrawal exceeds replenishment)**.

#### State of Groundwater in 2024

- **Groundwater Extraction:** The country's groundwater extraction rate stands at **60.4%**, consistent since 2009.
- **Safe Zones:** Approximately **73% of blocks** are classified as 'safe,' indicating sufficient replenishment to balance water withdrawal.

#### Central Ground Water Board (CGWB)

- **About**
  - The **Central Groundwater Board (CGWB)** is a key organization under India's Ministry of Jal Shakti, responsible for monitoring, managing, and regulating groundwater resources.
  - It maintains a vast network of observation wells to **assess groundwater quality and availability**.
  - It also provides technical guidance, promotes sustainable practices, and formulates policies to address groundwater-related challenges across the country.
- **Head quarter - Bhujal Bhawan, Faridabad, Haryana**
- **Organization Setup:** The Board is **headed by the Chairman** and **has five members**.
- **Measurement of Groundwater Levels: Observation Network**
  - **Current Network:** The Central Ground Water Board (CGWB) uses **26,000 observation wells to manually measure groundwater levels**.
  - **Digital Integration:** Since 2023, 16,000-17,000 piezometers equipped with digital water level recorders transmit real-time data to a central system.

## 10. Southern California wildfires 2025

#### Why in news?

Wildfires in **Los Angeles, California, have killed 10 people, forced over 130,000 evacuations, and destroyed homes, including those of celebrities like Paris Hilton and Billy Crystal.**

Major fires, such as the Palisades, Eaton, Sunset, Hurst, and Lidia fires, continue to burn, affecting areas like Hollywood Hills.

**The Oscars nominations announcement has been delayed due to the fires.** Although wildfires are common in California, the intensity and speed of these winter wildfires are unusual.

#### California Wildfires 2025

- **Origin and Timeline**
  - The first fire started on **January 7 in the Pacific Palisades neighbourhood of Los Angeles**.
  - It is the worst firestorm in recent memory, occurring unusually in January, traditionally the coldest winter month.
- **Unusual Timing and Drought Conditions**
  - Wildfires typically occur between **June and October, but the current blaze defies this pattern**.
  - **Southern California has been facing drought conditions, with only 40.9%** of the state drought-free as of December 31, 2024, compared to 96.65% the previous year.

#### Possible Cause of California Wildfires

- The exact trigger remains unknown, but power cables blowing in the wind are a likely cause.
- **Three Key Factors Behind the Conflagration**
  - **Wet Weather Followed by Extreme Dryness**
    - Unusually wet winters in 2022 and 2023 led to dense vegetation growth in the Los Angeles region.



- The winter of 2024-25 has been exceptionally dry, turning the vegetation into dry kindling.
- **NASA Report:** Since October, Southern California has had negligible rainfall, with Los Angeles recording its driest start to a water year since 1944.
- **Santa Ana Winds**
  - Common in the region but unusually strong this year. These winds:
    - **Blow westward from high-pressure systems in the Great Basin.**
    - **Lose humidity, gain heat, and increase in speed** as they descend over mountains.
    - **Result:** Fast, dry, and warm winds that rapidly spread flames over dry vegetation, power cables, and flammable wooden structures.
- **Impact of Climate Change**
  - Climate change has intensified extreme weather events, including wildfires.
- **Key Observations:**
  - Rising global temperatures, warmer springs, and early snow melts have extended and intensified dry seasons, increasing vegetation moisture stress.

### What are Santa Ana Winds?

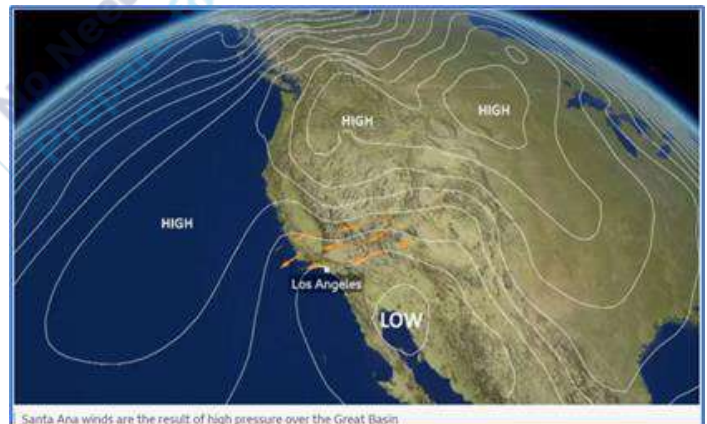
#### • About

- These are **strong, dry, and warm winds that blow from the inland deserts of Southern California toward the coast.**
- These winds are most common in the fall and winter months but can occur any time of the year.
- They are known for their ability to quickly spread wildfires due to their dry and powerful nature.

#### • Causes of Santa Ana Winds

##### ○ High-Pressure Systems in the Great Basin

- Santa Ana winds are caused by high-pressure systems that develop over the **Great Basin**, a desert region that spans parts of **Nevada, Utah, and California.**
- These high-pressure systems **create a clockwise circulation of air**, pushing winds toward lower-pressure areas along the California coast.



##### ○ Descending Air

- As the winds move westward, they descend from higher elevations (like **the Sierra Nevada and Santa Ana Mountains**) **toward lower elevations near the coast.**
- **During this descent:** The air compresses, heats up, and loses humidity.

##### • Narrow Passages and Speed Increase

- The winds are funnelled through mountain passes and canyons, which increase their speed significantly.
- Gusts can reach over **100 mph (160 km/h)** in some areas.

##### • Characteristics of Santa Ana Winds

- **Warm and Dry:** The air warms as it descends, making the winds hot and dry.
- **Strong Gusts:** The winds can reach extreme speeds, causing power outages and property damage.
- **Fuel for Wildfires:** The dryness and speed help spread flames rapidly by drying out vegetation.

## 11. Deciphering the Indus Script: A Gateway to Understanding Ancient Civilizations

### Background:



- The **Indus Valley Civilization (IVC)**, also known as the Harappan Civilization, flourished between **3000-1500 BCE**, spanning parts of present-day **India, Pakistan, and Afghanistan**.
- Despite its significance as one of the world's earliest urban cultures, the Indus script remains undeciphered, limiting our understanding of its social, political, and cultural dynamics.
- Recently, **Tamil Nadu Chief Minister** announced a **\$1 million prize** for deciphering the Indus script, underscoring its importance and the potential Dravidian connections to the ancient civilization.

#### **Why Deciphering the Indus Script is Important?**

- **Understanding Harappan Culture:**
  - The inability to decipher the script hinders scholars from providing a comprehensive picture of Harappan society, governance, and daily life.
  - Unlike **Egyptian hieroglyphs or Mesopotamian cuneiform, which have been decoded, the Indus script remains a "mystery script."**
- **Cultural and Linguistic Connections:**
  - Various scholars have linked the Indus script to **proto-Dravidian languages**, suggesting cultural continuity between the IVC and South India.
  - The survival of **Brahui**, a Dravidian language in the Indus region, and Dravidian loanwords in the **Rigveda** point to linguistic connections.
- **Potential Historical Insights:**
  - Decoding the script could provide insights into trade networks, religious practices, and societal hierarchies of the IVC.
  - It may reveal connections with other contemporary civilizations like Mesopotamia and Egypt.

#### **Key Findings from Recent Studies:**

- **Morphological Study in Tamil Nadu:**
  - A study by the **Tamil Nadu State Department of Archaeology (TNSDA)** found that **90% of graffiti marks** on pottery excavated in Tamil Nadu have parallels with the Indus script.
  - These marks were categorized into **42 base signs, 544 variants, and 1,521 composite forms**, showcasing their potential evolution from the Indus signs.
- **Cultural Exchange Hypothesis:**
  - Similarities in graffiti marks suggest possible cultural exchanges between the Indus Valley and South India during the Copper and Iron Ages.
  - The presence of **carnelian, agate beads, and high-tin bronze objects** in South Indian Iron Age graves points to trade links.
- **Graffiti vs. Script:**
  - The study differentiates between **graffiti marks** (on pottery) and **script** (on seals and objects) but notes their common origins and undeciphered status.

#### **The Dravidian Hypothesis:**

- The **Dravidian hypothesis** argues that the Indus script represents an early form of Dravidian language. This view is supported by:
  - The structural similarities of the Indus script to Dravidian linguistic patterns, such as **suffix-based grammar**.
  - The influence of Dravidian substratum on **Prakrit dialects and Indo-Aryan languages**.
- However, scholars caution that while substantial linguistic evidence supports this theory, more research is needed to achieve a universally accepted interpretation.

#### **Challenges in Deciphering the Script:**

- **Lack of Bilingual Texts:**

- Unlike the **Rosetta Stone for Egyptian hieroglyphs**, no bilingual inscriptions have been found to aid the decoding of the Indus script.
- **Limited Data:**
  - The brevity of Indus inscriptions, with an average length of **4-5 symbols**, makes pattern recognition difficult.
- **Absence of a Contextual Framework:**
  - Without understanding the cultural or linguistic context, linking the symbols to their meanings remains speculative.

#### **Recent Initiatives and Global Collaboration:**

- **International Conferences:**
  - Events like the centenary celebration of the IVC's discovery in Tamil Nadu aim to **foster collaboration among global experts in archaeology, linguistics, and computational analysis.**
- **Technological Approaches:**
  - Advanced techniques like **AI-driven pattern recognition** and **computational linguistics** are being explored to analyse the structure of the Indus script.
- **Historical Comparisons:**
  - Comparative studies with other undeciphered scripts, like the **Rongorongo of Easter Island**, provide methodological insights.

#### **Future Directions:**

- **Expanding Excavations:**
  - Further archaeological excavations in both **Indus Valley sites and South India** are crucial for **unearthing more inscriptions and artifacts.**
- **Scientific Analysis:**
  - Radiocarbon dating, material analysis, and **genetic studies** of artifacts can provide a deeper understanding of cultural exchanges.
- **Multidisciplinary Research:**
  - Collaboration between historians, archaeologists, linguists, and data scientists is essential to develop robust methodologies for decipherment.

## **12. Building a System That Sees the Migrant Worker**

### **Context**

- The **Ministry of Labour and Employment (MoL&E)** in India recently declared the **e-Shram portal** as the **largest database of unorganised workers** globally, with over 300 million workers registered.
- **Launched in May 2021** in response to the Supreme Court's directive, **the portal aimed to address the distressing plight of migrant workers during the COVID-19 pandemic** by creating a unified national database.
- **Despite this ambitious initiative, challenges in its implementation and gaps in its utility highlight the pressing need for more robust measures** to ensure social protection and inclusion for India's vulnerable unorganised workforce.

### **Historical Context and the Need for a Database**

- The concept of maintaining a database for migrant and unorganised workers is not new.
- **The Interstate Migrant Workmen Act (1979)** mandated **contractors to provide detailed worker records**, and the National Commission for Enterprises in the Unorganised Sector (2007) called for universal worker registration.
- Similarly, **the Unorganised Workers' Social Security Act (2008)** proposed **identity cards for workers.**
- However, **these efforts failed to gain traction**, leaving millions of workers invisible to policymakers and the public.
- **This historical neglect underscores the significance of the e-Shram portal** as a potentially transformative initiative.

### Understanding the Vulnerability of Migrant Workers

- **Socio-Economic Exclusion**

- The lack of stable employment ties leaves migrant workers in a precarious situation.
- **Many are employed informally** in sectors such as construction, agriculture, domestic work, and small-scale industries, where job security is almost non-existent.
- **Without formal contracts, they have little to no bargaining power** and are frequently subjected to exploitative working conditions, including low wages, long hours, and unsafe environments.
- The **absence of unionisation further worsens their vulnerability**, as they are unable to collectively advocate for better terms or working conditions.

- **Challenges of Disenfranchisement**

- Due to the transient nature of their employment, **migrant workers often lack access to fundamental rights like voting.**
- **Many are unable to register as voters in their place of work**, and their names are often missing from electoral rolls in their home states.
- This **disenfranchisement not only alienates them politically but also deprives them of a voice in decisions** that directly impact their lives, reinforcing their marginalisation.

- **Poor Access to Social Services**

- **Access to essential services** such as healthcare, education, housing, and social security **is severely limited for migrant workers.**
- The **lack of portability of welfare benefits across states** means that they often cannot avail themselves of **government schemes** in their place of work.
- For instance, **migrant families may lose access to ration cards** or healthcare benefits when they move to a new location.
- Similarly, **their children are at risk of losing continuity in education due to frequent relocations**, perpetuating the cycle of poverty and vulnerability.

- **Stigma and Discrimination**

- **Migrant workers frequently face stigma and discrimination** in host communities.
- They are **often viewed as outsiders and treated with suspicion**, which leads to social exclusion and sometimes even hostility.
- **This discrimination can limit their opportunities** to integrate into local communities and access resources, further isolating them.
- **Women migrants are particularly vulnerable to exploitation and harassment**, both at work and in their living conditions, compounding their struggles.

### Persistent Challenges

- **Documentation and Eligibility Exclusion**

- A significant challenge **lies in the exclusion of workers due to inadequate documentation.**
- **Many migrant workers lack essential identification documents** such as Aadhaar cards, ration cards, or voter IDs, which are often prerequisites for registration.
- Additionally, **issues such as unlinked mobile numbers, lack of permanent phone access, or inconsistent address details complicates their ineligibility.**
- For workers who are constantly on the move or live in temporary housing, **these documentation requirements become insurmountable hurdles**, effectively locking them out of social protection mechanisms.

- **Technological Barriers**

- **Although the e-Shram portal aims to simplify access through technology**, digital illiteracy among unorganised workers poses a significant barrier.
- **Many workers, especially those in rural areas, are unfamiliar with online processes** or lack access to smartphones and reliable internet connectivity.



- This **digital divide disproportionately affects women workers**, who often have limited access to personal mobile devices.
- **As a result, many workers are unable to navigate the registration process independently**, relying on intermediaries who may exploit them.
- **Limited Portability of Benefits**
  - The **mobility of migrant workers creates a unique challenge in ensuring access to welfare benefits** across states.
  - While initiatives like the **One Nation One Ration Card (ONORC)** attempt to address this issue, **many schemes remain tied to a worker's place of origin**.
  - This **lack of portability leaves inter-state migrants unable to access entitlements** such as subsidised food, housing, or healthcare in their destination states.
  - **Without seamless integration of welfare schemes across jurisdictions, a large segment of the migrant workforce remains excluded** from critical support systems.
- **Fragmentation of Social Security Systems**
  - **India's social security landscape is highly fragmented**, with multiple schemes operating under different ministries and departments.
  - While the **OSS attempts to integrate these schemes, the process is far from complete**.
  - **Key welfare programs like PM Matru Vandana Yojana and Shramik Suraksha Yojana are yet to be linked with the e-Shram portal**, leaving gaps in coverage.
  - Additionally, **overlapping responsibilities and bureaucratic inefficiencies slow down the implementation of a cohesive framework**.

#### The Path Ahead

- To fully realise its potential, **the e-Shram portal must transcend its role as a mere registration platform and evolve into a comprehensive tool** for empowering workers.
- This **requires disaggregating migration data, enhancing portability of benefits, and integrating human development outcomes** into program design.
- **Non-profits and policymakers advocate viewing migrants as assets rather than burdens**, emphasising their critical role in driving economic growth.
- **The 2030 Agenda for Sustainable Development warns that poorly managed migration can impede progress**.

#### Conclusion

- **Migrants and unorganised workers are indispensable to India's economy**, yet they continue to await recognition and rights.
- **The e-Shram portal and OSS are commendable steps, but achieving "Viksit Bharat" (Developed India) demands well-designed social protection systems** that prioritise inclusion and equity for this workforce.
- While the e-Shram portal has laid the foundation for addressing long-standing challenges faced by unorganised workers, **its success depends on overcoming systemic barriers and integrating inclusive, sustainable policies**.

## 13. Winter Char Dham

### Why in news?

The Uttarakhand government on December 8 inaugurated the winter Char Dham circuit, aimed at drawing tourists to the state in the off-season winter months.

### Char Dham: Sacred Shrines of the Garhwal Himalayas

- **The Revered Char Dham Shrines**

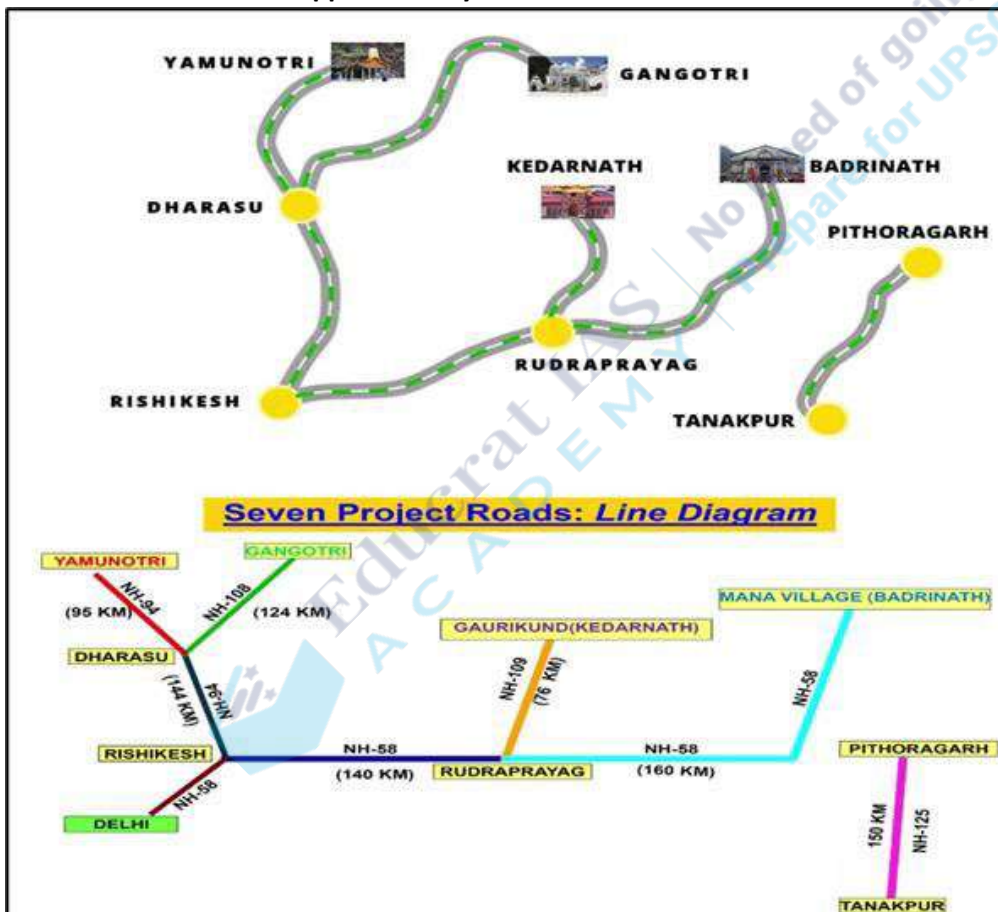




- Located in Uttarakhand's Garhwal Himalayas, the Char Dham comprises **Gangotri, Yamunotri, Kedarnath, and Badrinath**.
- These shrines attract lakhs of pilgrims annually from May to November, contributing significantly to the state's economy.
- **Winter Inaccessibility and Alternate Seats**
  - Heavy snowfall during winter makes the shrines inaccessible, leading to their seasonal closure.
  - **Deities are relocated to lower-altitude winter seats:**
    - **Gangotri:** Mukhba, Uttarkashi
    - **Yamunotri:** Kharsali, Uttarkashi
    - **Kedarnath:** Omkareshwar Temple, Ukhimath, Rudraprayag
    - **Badrinath:** Pandukeshwar, Chamoli

### Char Dham All Weather Highway Development Project

- It is a highway expansion project to widen 889 km of hill roads to provide all-weather connectivity in the Char Dham circuit.
- The project, envisaged in 2016, covers Uttarakhand's four major shrines — **Badrinath, Kedarnath, Gangotri and Yamunotri** — in the upper Himalayas.



### Promoting Winter Char Dham Tourism

- **Off-season tourism**
  - Winter Char Dham attracts pilgrims during the off-season to boost tourism.
  - As of December 30, 15,314 pilgrims visited the winter shrines, with Omkareshwar Temple receiving the highest footfall (6,482), followed by **Pandukeshwar (5,104), Mukhba (3,114), and Kharsali (614)**.
- **Changing Uttarakhand's Image**
  - **Beyond a Summer Destination**



- The winter Char Dham aims to position Uttarakhand as a year-round destination.
- Tourists are encouraged to explore lesser-known spots near the winter abodes of the Char Dham shrines.
- **'Sun Tourism' Initiative**
  - **Leveraging clear skies and fresh air during North India's smog-filled winters**, the state seeks to attract visitors.
  - The initiative is expected to boost the state's economy and reinvigorate tourism in the off-season.
- **Economic Significance of Char Dham**
  - The **Char Dham generates over Rs 200 crore daily for Uttarakhand's economy during the pilgrimage season.**
  - Winter tourism is yet to see substantial growth, but officials are optimistic about increased footfall as the season progresses.

#### Various Concerns

- **Impact of Overcrowding and Commercialisation**
  - **Unchecked increase in pilgrimage numbers leads to overcrowding, environmental degradation**, and the commercialisation of sacred sites.
  - Strain on local infrastructure and fragile ecosystems disrupts the sanctity of holy places.
- **Winter Wildlife Disturbance**
  - **Winter traffic affects rare and threatened wildlife** like snow leopards and mountain sheep, as they descend to lower altitudes for food and water.
  - Shy animals face disruptions due to human presence in sensitive areas.
- **Harsh Terrain and Weather Risks**
  - Safety, security, and public health are key concerns for pilgrims during harsh winter conditions in Uttarakhand's mountainous regions.

#### Recommendations and Actions

- **Sustainable Yatra Management**
  - **A sustainable approach is needed to balance pilgrimage with environmental preservation.**
  - Proper management can mitigate the negative impacts of increased footfall.
- **Carrying Capacity Assessment**
  - The **National Green Tribunal** instructed the state to ascertain the Char Dham's carrying capacity.
  - The **Uttarakhand Pollution Control Board** has engaged the **Wildlife Institute of India** to study and report on this within a year.



## General Studies II

### 1. An Opportunity to Settle Sri Lanka's Ethnic Problem

#### Context

- **India's decision to name the Jaffna Cultural Centre after the Tamil poet-philosopher Thiruvalluvar is a symbolic move that underscores its deep historical and cultural ties with Sri Lanka.**
- **This gesture not only acknowledges the Tamil heritage but also serves as a diplomatic tool to reinforce India's influence in Sri Lanka,** particularly among the Tamil-speaking population.
- However, beyond the cultural significance, **the relationship between the two nations has been shaped by decades of political complexities,** particularly regarding the Tamil issue and the implementation of the **13th Amendment (13A) to Sri Lanka's Constitution.**

#### Historical and Political Context of 13<sup>th</sup> Amendment and India's Stance

- **Historical and Political Context of 13<sup>th</sup> Amendment**
  - India's involvement in Sri Lanka's Tamil issue dates back to the **1983 anti-Tamil pogrom,** which led to its role as **a mediator** and later as an active player in resolving the ethnic conflict.
  - This culminated in the **Indo-Lanka Accord of 1987,** which resulted in the **13th Amendment,** introducing **Provincial Councils with limited autonomy.**
  - However, the **amendment has remained a contentious issue,** facing resistance from both Sinhalese nationalist groups and Tamil separatist forces.
  - **The Janatha Vimukthi Peramuna (JVP),** the party of Sri Lankan President Anura Kumara Dissanayake, has **traditionally opposed 13A,** viewing it as an **imposition by India.**
  - **Similarly, the Liberation Tigers of Tamil Eelam (LTTE),** though advocating Tamil autonomy, **rejected the amendment as inadequate.**
- **India's Stance on the 13th Amendment**
  - Despite over 35 years since its introduction, **the full implementation of 13A remains elusive, especially in Tamil-majority areas.**
  - **Successive Indian governments** have consistently **urged Sri Lanka to implement the amendment fully.**
  - However, **recent developments, such as Indian Prime Minister Narendra Modi's omission of any direct mention of 13A** during Sri Lankan President Dissanayake's visit in December 2024, **have raised questions about whether India is shifting its stance.**
  - While Foreign Minister S. Jaishankar reiterated India's call for devolution, Modi's silence suggests a possible recalibration of India's approach, potentially influenced by Sri Lanka's evolving domestic politics.

#### Sri Lanka's Political Landscape and Devolution Debate

- **The JVP and the NPP's Stance on Devolution**
  - A critical factor shaping the debate on devolution today is the stance of the JVP, a left-wing nationalist party that has historically opposed 13A.
  - The party, **which played a significant role in two armed uprisings (in 1971 and 1987-89),** viewed the Indo-Lanka Accord and its resulting constitutional amendment as an **infringement on Sri Lanka's sovereignty.**
  - This position has persisted even as the JVP evolved into a mainstream political force.
  - Currently, **the JVP leads the National People's Power (NPP) coalition,** which has emerged as a dominant political force in Sri Lanka.
  - **President Anura Kumara Dissanayake,** who hails from the JVP, **has not explicitly stated whether his government will fully implement 13A.**



- During his 2024 parliamentary election campaign in Jaffna, **he largely avoided discussing the issues of power devolution and a political settlement for the Tamils**, raising concerns that his administration may not prioritize Tamil autonomy.
- **The Ambiguity in the NPP's Constitutional Promises**
  - The **NPP's 2024 election manifesto promised to draft a new constitution** that strengthens democracy and ensures equality for all citizens.
  - However, **it did not explicitly mention greater autonomy for the Tamil-majority Northern and Eastern provinces**.
  - Instead, **it proposed a "devolution of political and administrative power to every local government, district, and province"**, suggesting a broader but less concrete approach to decentralisation.
  - The **manifesto also committed to holding provincial and local government elections within a year**, a crucial step given that provincial councils have been defunct since 2019.
  - However, **it remains unclear whether these elections will lead to meaningful devolution or if they will merely reinforce existing administrative structures** without addressing Tamil political demands.
- **The Risk of Local Government Supplanting Provincial Councils**
  - One of the key debates in Sri Lanka's devolution discourse is **whether local government bodies can serve as an alternative to provincial councils**.
  - Local bodies, such as municipal and district councils, have a much longer history in Sri Lanka than provincial councils and are responsible for grassroots governance.
  - However, **they lack the financial and administrative capacity** to address broader regional challenges, **particularly in the Tamil-majority areas**, which continue to struggle with post-war reconstruction and economic underdevelopment.
  - **The fear among many Tamil leaders is that the government may prioritise strengthening local government institutions while ignoring provincial councils**, thereby sidestepping the core issue of regional autonomy.
  - Unlike provincial councils, which were established as a direct outcome of 13A, **local bodies function under a different administrative framework with limited powers**.
  - **If the government focuses only on local bodies** without empowering provincial councils, **Tamil aspirations for meaningful self-governance may remain unfulfilled**.
- **The Role of Sinhalese Nationalism in the Devolution Debate**
  - The broader devolution debate in Sri Lanka is also influenced by **Sinhalese nationalist sentiment**, which **opposes granting more autonomy to Tamil-majority regions**.
  - Many nationalist groups fear that **implementing 13A fully—especially provisions related to land and police powers—could lead to a gradual push for separatism**.
  - This **sentiment has historically shaped government policies**, leading to reluctance in implementing devolution measures despite repeated Indian diplomatic pressure.

### **The Way Forward: Towards a Durable Solution**

- For Sri Lanka to achieve long-term stability and reconciliation, **the ruling coalition must recognize that the Provincial Councils** are not merely an Indian creation but a product of Sri Lanka's own political evolution.
- The country's constitutional framework has historically drawn from global models, **including British, American, and French systems**.
- Therefore, **dismissing 13A as an external imposition overlooks its potential to provide a democratic solution** to the ethnic conflict.
- With a two-thirds majority in Parliament and a popular President, **the NPP has a unique opportunity to enact meaningful reforms**.
- **A balanced approach that respects the aspirations of the Tamil population** while maintaining national unity is essential.
- **Implementing the full provisions of 13A, including holding provincial council elections, would be a significant step** in addressing Tamil grievances and reinforcing Sri Lanka's democratic credentials.

### Conclusion

- **India's decision to rename the Jaffna Cultural Centre after Thiruvalluvar symbolises its commitment to cultural diplomacy** and its historical ties with Sri Lanka, however, the deeper issue of Tamil political rights remains unresolved.
- **The 13th Amendment, despite its flaws,** remains the most **viable framework for addressing Tamil aspirations** within a united Sri Lanka.
- While India's stance on the issue may be evolving, **Sri Lanka's leadership must recognise that meaningful devolution is not merely a diplomatic obligation but a necessity** for national harmony.

## 2. India-China diplomatic thaw

### Why in news?

India and China have taken significant steps to improve their bilateral relations, including **resuming the Kailash Mansarovar Yatra this summer, restoring direct flights, issuing visas for journalists and think tanks, and sharing trans-border river data.**

These decisions followed a meeting between India's Foreign Secretary Vikram Misri and Chinese officials.

### Fine print of India - China statements

- **On the framing of the meeting**
  - **India's Framing of the Meeting**
    - India's statement emphasized the review of the overall state of **India-China bilateral relations, with a focus on people-centric steps to stabilize and rebuild ties.**
    - India highlighted the agreed actions from the previous meeting between PM Modi and President Xi Jinping in Kazan, conveying a cautious and nuanced approach to the discussions.
  - **China's Framing of the Meeting**
    - China, on the other hand, framed the discussions as being focused on the improvement and development of bilateral relations, noting that the two sides reached a consensus on specific measures.
    - Beijing presented a more optimistic assessment of the talks, with a focus on progress and forward-looking outcomes.
- **Kailash Mansarovar Yatra**
  - The statements from both India and China are similar regarding the **resumption of the Kailash Mansarovar Yatra**, but the Chinese statement reflects more urgency, specifying it will happen "**as soon as possible.**"
  - India stated that the yatra will resume in **summer 2025**, with discussions on modalities taking place as per existing agreements.
  - China, however, mentioned the visit would be to the **Xizang Autonomous Region** and emphasized that discussions on arrangements would be initiated quickly.
- **Direct Flights**
  - **India and China also agreed in principle to resume direct flights, but with slight differences in emphasis.**
  - India's statement highlighted the need for a new pact and for technical authorities from both sides to meet and negotiate an updated framework.
  - China's statement, meanwhile, connected the resumption of flights with facilitating personnel flows and exchanges of resident journalists.
  - Before the flights were suspended due to the pandemic and the Galwan clash in 2020, the two countries had 539 direct flights per month, with a total seat capacity of over 1.25 lakh.
  - Currently, **India has only one resident journalist in China, while China has none.**
- **Trans-Border River Cooperation**
  - India and China have agreed to hold an **early meeting** of the **India-China Expert Level Mechanism** to discuss issues related to **trans-border rivers**, including the sharing of hydrological data.



- This follows concerns raised by India about China's construction of the world's largest dam on the **Brahmaputra** River, which was cleared in January.
- India stated that the meeting would focus on the **resumption of hydrological data provision** and other forms of cooperation concerning trans-border rivers.
- China, similarly, emphasized the advancement of **trans-border river cooperation** and maintaining communication for an early meeting of the Expert Level Mechanism.

#### Analysis

##### • India's Approach

- India advocated for a **step-by-step approach** to address areas of mutual **interest** and **concern**, particularly focusing on the **border situation**.
- The Indian statement highlighted the resumption of existing dialogues, agreeing to take a gradual approach in addressing each side's priorities through these mechanisms.

##### • China's Approach

- China maintained its **long-term strategy** for handling bilateral relations, emphasizing that both sides should view and manage relations based on the **fundamental interests** of their countries and peoples.
- The Chinese statement stressed the importance of advancing exchanges and practical cooperation with a **constructive attitude**, while enhancing **mutual trust** and managing differences.
- China called for promoting relations along a **sound and stable track** from a **strategic and long-term perspective**.

##### • Trade Concerns

- India raised specific concerns regarding market access and discussed the need for policy transparency and predictability in economic and trade areas.
- However, the Chinese statement did not address these concerns, leaving the issue unmentioned on their side.

##### • Support for SCO Presidency

- China mentioned that **India would extend full support for China's presidency of the Shanghai Cooperation Organization (SCO) and actively participate in the meetings under the SCO umbrella**.
- In contrast, India did not comment on this aspect in its statement.

##### • Differing Views on Mutual Relations

- China emphasized the importance of avoiding mutual suspicion, estrangement, and exhaustion in relations between the two countries.
- This framing contrasts with India's approach, as outlined by **External Affairs Minister S. Jaishankar, who has described India's approach as focusing on mutual respect, mutual sensitivity, and mutual interests**.
- The differences in these three mutuals reflect divergent perspectives on the nature of their relationship.

### 3. ASER (Rural) 2024- A Story of Recovery and Progress in Foundational Learning

#### Context:

- **The Annual Status of Education Report (ASER) 2024** is a nationwide rural household survey (facilitated by NGO Pratham) to assess children's schooling status and their basic reading and arithmetic skills.
- Key findings of the ASER 2024 survey are presented separately for **three groups of children**: Pre-primary (age group 3-5), elementary (age group 6-14), and older children (age group 15-16).
- The findings highlight a **strong recovery from pandemic-induced learning losses** and point towards the effectiveness of recent educational reforms.

#### Key Findings from ASER 2024:

##### • Enrollment trends:

- **The overall school enrollment rate** among 6-14-year-olds stood at 98.1% in 2024, close to 98.4% in 2022.



- **Pre-school enrollment** among 3-5-year-olds increased, with a sharp rise among 5-year-olds from 58.5% in 2018 to 71.4% in 2024.
- **Recovery in reading skills:**
  - The proportion of **Class III** students able to read at a Class II level has fully recovered from the pandemic setback, reaching 27.1% in 2024 (up from 20.5% in 2022).
  - For **Class V** students, the percentage of children who can read Class II level text has risen to 48.7% in 2024, compared to 42.8% in 2022, approaching the 50.4% level of 2018.
- **Progress in arithmetic skills:**
  - The percentage of **Class III** students able to do basic subtraction rose to 33.7% in 2024, the highest in a decade.
  - The proportion of **Class V** students who can perform division increased to 30.7% in 2024, surpassing pre-pandemic levels of 27.8% in 2018.
- **Digital literacy insights:**
  - ASER 2024 included a section on digital literacy for the first time, focusing on **smartphone access, ownership, and basic digital skills** among 14-16-year-olds.
  - **More boys (85.5%)** than girls (79.4%) reported knowing how to use a smartphone.

#### **Performance of Government Schools:**

- **Improvements in enrollment trends:** Government school enrollment, which increased during the pandemic, has **nearly returned to pre-pandemic levels** - 66.8% in 2024, compared to 65.6% in 2018 and 72.9% in 2022.
- **Improvements in learning outcome:**
  - **In arithmetic**, government schools witnessed a 36.6% improvement in subtraction skills in Class III, compared to a 10.2% rise in private schools.
  - The number of Class III children in government schools who can read a Class II textbook stands at 23.4%, up from 16.3% in 2022 and 20.9% in 2018.
- **Factors behind the improvement:**
  - The National Education Policy (NEP) 2020's focus on foundational literacy and numeracy (FLN) appears to have played a crucial role.
  - The Union Education Ministry's **Nipun Bharat Mission** has been a key driver of learning initiatives in primary education.

#### **State-wise Progress:**

- **Remarkable recovery in low-performing States:**
  - States like **UP, Bihar, MP, and Tamil Nadu** have shown significant learning gains.
  - **In UP**, the proportion of Class III government school students reading at Class II level rose from 12.3% in 2018 to 27.9% in 2024.
  - **Bihar** saw an increase in Class III reading levels from 12.1% in 2018 to 20.1% in 2024 and arithmetic levels from 18% to 28.2%.
- **Improvement in high-performing States:**
  - States like **Himachal Pradesh, Maharashtra, Uttarakhand, Haryana, and Odisha** showed a 10-percentage point increase in reading levels from 2022 to 2024.
  - Uttarakhand recorded a sharp rise in Class III reading levels from 24.7% in 2018 to 35.6% in 2024.

#### **Conclusion:**

- ASER 2024 highlights not just recovery but a **transformative shift** in India's approach to foundational learning.
- The **NEP 2020 has provided a common goal for all states, allowing them to adopt unique strategies for FLN improvement.**
- The data underscores a nationwide effort to ensure foundational literacy and numeracy among primary school children, marking a **historic milestone** in India's education system.



#### 4. Should Governors Be Chancellors of State Universities?

##### Historical Context of the Governor's Role:

- The role of Governors as Chancellors of State universities in India traces its roots to colonial-era policies.
- **Introduced in 1857 with the establishment of universities in Calcutta, Bombay, and Madras**, this model aimed to maintain British control over educational institutions.
- Post-independence, the system was retained without reconsideration of its relevance in a democratic and federal context.
- Governors, in their capacity as Chancellors, wield significant authority over universities, including appointing Vice-Chancellors, nominating syndicate members, and approving university statutes.
- However, this role has often led to conflicts, especially in states governed by opposition parties.

##### Challenges of the Current System:

- **Politicization of the Role:**
  - From the late 1960s, Governors transitioned from neutral figures to politically influenced appointees.
  - Studies reveal that **52% of Governors between 1950 and 2015 were active politicians**, undermining the credibility of the position.
- **Conflicting Authorities:**
  - The dual accountability of universities to both state governments and Governors has led to governance challenges, including **delays in appointments and decision-making**.
- **Lack of Expertise:**
  - Many Governors **lack the academic qualifications** necessary to guide universities effectively.
  - This gap often results in **non-transparent decisions and political interference**.
- **Erosion of Federal Principles:**
  - Allowing centrally appointed Governors to control state-funded institutions dilutes federalism, reducing universities' accountability to state governments.

##### Insights from Commissions and Alternatives:

- Several commissions have highlighted the limitations of the Governor's role:
  - **Sarkaria Commission (1983-88):** Recognized the Governor's statutory role but recommended consultations with Chief Ministers in university matters.
  - **M. M. Punchhi Commission (2007-10):** Advocated for separating the Governor's constitutional and statutory roles, suggesting that states appoint eminent academicians as Chancellors.

##### Reform Models:

- **Ceremonial Role:** States like **Gujarat, Karnataka, and Maharashtra** have redefined the Governor's role to a ceremonial one, acting on the advice of the Council of Ministers.
- **State-Appointed Chancellors:** Telangana and Kerala propose appointing distinguished academicians or public figures as Chancellors, but such reforms face delays in Presidential assent.
- **University-Elected Chancellors:** Global practices, like those in Oxford and Melbourne, allow university bodies to elect Chancellors, ensuring autonomy and accountability.

##### Need for Progressive Reforms:

- The colonial legacy of Governors as Chancellors must be dismantled to ensure university autonomy, foster academic excellence, and minimize political interference.
- Reforming university governance aligns with global best practices and reinforces India's federal structure.
- States like **Tamil Nadu, Kerala, and West Bengal await Presidential assent for their reform Bills**, highlighting the need for equitable and timely decision-making at the national level.





**Conclusion:**

- Reforming the role of Governors as Chancellors is essential for **fostering transparent, accountable, and autonomous university governance.**
- By adopting models that prioritize academic independence and minimize political entanglements, India can create an educational framework aligned with democratic principles and global standards.

## 5. An Enduring Commitment to the Indo-Pacific

**Context**

- The **inauguration of Donald Trump as the 47th President** of the United States marks an extraordinary political comeback, **reshaping American politics and signalling a critical moment in global geopolitics.**
- **Central to the vision of Trump's administration is the Indo-Pacific region,** which plays a vital role in shaping global trade, security, and stability.
- Therefore, **it is crucial to explore the Indo-Pacific's growing significance, analyses the evolution of U.S. policy, and outlines the potential trajectory of Trump's approach** to the region.

### The Indo-Pacific Region Under Trump's First Term: Redefining the Indo-Pacific

- **A New Geopolitical Lens**
  - **Trump's administration popularised the term 'Indo-Pacific,'** moving beyond the narrower Asia-Pacific framework to encompass a broader geographical and strategic focus.
  - This **semantic shift underscored the significance of the Indian Ocean alongside East Asia,** reflecting Washington's commitment to countering China's growing influence in both maritime and terrestrial spheres.
  - The **Indo-Pacific narrative emphasised securing vital sea lines of communication, addressing maritime security challenges,** and maintaining a balance of power in a region central to global trade and security.
- **Institutional and Structural Reforms**
  - **Significant structural adjustments further cemented the region's importance** in U.S. strategic thinking.
  - The **renaming of the U.S. Pacific Command to the U.S. Indo-Pacific Command in 2018 symbolised the operational prioritisation** of the region.
  - Moreover, **the Office of the Secretary of Defence reorganised its framework to establish specialised units focusing on partnerships with Indo-Pacific allies,** signalling a long-term commitment to safeguarding regional stability.
- **Revival of the Quad**
  - Perhaps most crucially, **the Trump administration revitalised the Quad,** elevating it from an informal dialogue to a ministerial-level engagement.
  - This **reflected a pragmatic convergence of interests among the United States, India, Japan, and Australia** in countering shared challenges, including China's assertiveness in the South China Sea and the need for resilient supply chains.
  - **Maritime security, technological cooperation, and standards-setting became focal points of the Quad,** laying the groundwork for deeper collaboration in maintaining a rules-based order.

### Indo-Pacific Under Biden

- **Continuity with a Broader Agenda**
  - The **Biden administration inherited Trump's Indo-Pacific framework,** maintaining its strategic centrality while expanding its scope.
  - **Biden elevated the Quad further by organising the first Quad leaders' summit in 2021,** broadening its focus beyond defence to include pressing global challenges like vaccine distribution, climate change, and critical infrastructure development.



- **This approach reflected a blend of hard and soft power**, emphasising multilateralism and inclusive development to strengthen the Indo-Pacific's stability and prosperity.
- **Introduction of Indo-Pacific Economic Framework (IPEF)**
  - **Biden also introduced the Indo-Pacific Economic Framework (IPEF) in 2022** to complement strategic priorities with economic engagement.
  - **These efforts underlined a bipartisan consensus in Washington** on the Indo-Pacific's critical role, providing a solid foundation for Trump's second term to build upon.

#### **Potential Trajectory of Trump's Approach to the Indo-Pacific Region**

- **Countering China's Assertiveness**
  - The **administration views China not only as a regional competitor but also as a global adversary** with ambitions to challenge the U.S.-led world order.
  - **Secretary of State Marco Rubio's remarks, describing China as the most formidable adversary**, underscore the administration's commitment to adopting a more confrontational stance.
  - This **may involve increased freedom-of-navigation operations in contested areas like the South China Sea**, expanded sanctions against Chinese entities, and intensified efforts to counter Beijing's Belt and Road Initiative by offering alternative development projects to nations in the region.
  - **The U.S. is expected to lead a coalition of like-minded countries to deter coercive actions by China**, particularly those that seek to alter the status quo through force or intimidation.
- **Strengthening the Quad as a Pillar of Regional Stability**
  - The Quad **remains a cornerstone of Trump's Indo-Pacific strategy**.
  - The **grouping of the U.S., India, Japan, and Australia is seen as a vital mechanism** for promoting a free and open Indo-Pacific.
  - Trump's administration will **likely prioritise making the Quad more operational**, with an emphasis on joint military exercises, intelligence sharing, and coordinated responses to maritime security challenges.
  - **The revival of the Quad during Trump's first term was a reflection of its strategic necessity**, and his administration is poised to take it further.
  - **Regular ministerial and leaders' summits, such as the one planned to be hosted by India, will focus on institutionalising the Quad into a more robust platform** for addressing regional challenges.
- **Advancing Defence Cooperation**
  - A **central feature of Trump's Indo-Pacific strategy will be deepening defence ties** with key regional allies and partners.
  - The **renaming of the U.S. Pacific Command to the U.S. Indo-Pacific Command during Trump's first term was symbolic of this commitment**.
  - **In his second term, Trump is likely to accelerate efforts to build the defence capacities of allies like India, Japan, and Australia** through technology transfers, joint exercises, and co-production agreements.
  - **Trump's administration may also expand trilateral or multilateral defence initiatives** beyond the Quad.
  - For instance, **enhancing military collaboration with Southeast Asian nations such as Vietnam, the Philippines, and Indonesia could serve to reinforce regional deterrence** against China.
- **Promoting Economic and Technological Alliances**
  - While hard power will dominate Trump's Indo-Pacific strategy, **economic and technological collaboration will remain critical components of his approach**.
  - **Recognising the importance of economic security** in maintaining a free and open Indo-Pacific, **Trump's administration is likely to promote resilient supply chains** that reduce dependency on China.
  - This **could involve strengthening initiatives to diversify production networks**, particularly in key sectors like semiconductors, pharmaceuticals, and critical minerals.
  - Furthermore, **technological partnerships with Indo-Pacific allies are expected to gain prominence**.
  - The **U.S. may spearhead initiatives to develop and deploy 5G networks, artificial intelligence, and other advanced technologies**, ensuring that these innovations align with democratic values and standards.



- **Balancing Hard Power with Broader Agendas**

- While the focus on hard power will be a defining feature of Trump's second term, **the administration is also likely to support broader initiatives that align with U.S. strategic interests.**
- For example, **efforts to address climate change, enhance vaccine distribution, and promote infrastructure development in the Indo-Pacific** could serve as complementary strategies to reinforce regional stability.
- These initiatives, **however, will likely be pursued through bilateral or multilateral frameworks that prioritise U.S. leadership** and align with the broader objective of countering China's influence.

### Conclusion

- **Donald Trump's second term as President heralds a renewed focus on the Indo-Pacific**, reaffirming its centrality to U.S. foreign policy and global geopolitics.
- By building on the foundational work of his first term and leveraging bipartisan consensus, **Trump's administration is poised to adopt a more assertive posture against China while creating deeper collaboration with Quad partners.**
- As the Indo-Pacific continues to shape the geopolitical dynamics of the 21st century, **the U.S.'s role under Trump 2.0 will be critical in navigating this complex and evolving landscape.**

## 6. At 75, Constitutional Justice and Personal Liberty

### Context

- As we celebrate 75 years of the Constitution of India, **it is imperative to reflect not just on its achievements but also on the challenges to its core values.**
- **The Constitution**, envisioned by its framers as a beacon of justice, equality, and liberty, **finds itself mired in an ethical and moral crisis.**
- At 75, **it is important to examine historical and contemporary dimensions of the struggle for personal liberty**, with a focus on the reinvigoration of dissent as a constitutional ethic and the role of the judiciary in safeguarding justice.

### The Role of Dissent in Constitutional Ethics

- **The Pillar of Democracy**
  - Dissent forms **the lifeblood of a vibrant democracy**, embodying the spirit of free expression and critique that is essential for societal progress.
  - Within the constitutional framework of India, **dissent is not merely a right but a fundamental ethic that safeguards the balance between state power and individual freedoms.**
  - **The Supreme Court's evolving stance on dissent**, as seen in key judgments, **underscores its critical role in upholding the moral and ethical spirit of the Constitution.**
- **The Foundational Challenge: A.K. Gopalan vs State of Madras**
  - A **defining moment in the jurisprudence of dissent was the case of A.K. Gopalan vs State of Madras (1950)**, which tested the nascent Constitution's commitment to personal liberty.
  - The **majority opinion in the case adopted a compartmentalized interpretation of fundamental rights**, allowing preventive detention to stand without rigorous scrutiny.
  - However, **Justice S. Fazl Ali's dissenting opinion offered a broader, more integrated understanding of liberty**, emphasising its inseparability from justice and dignity.
  - **While his views were not adopted at the time, they laid the groundwork for future interpretations** that sought to reconcile the Constitution's technical provisions with its overarching ethical values.
- **The Revival of Dissent: Puttaswamy vs Union of India**
  - The **significance of dissent was reinstated decades later in Puttaswamy vs Union of India (2017)**, a landmark judgment that affirmed the fundamental right to privacy.



- By referencing Justice Fazl Ali's dissent, the Supreme Court acknowledged the flaws in earlier majority judgments that had curtailed liberty.
- This recognition of dissent as a constitutional ethic marked a shift toward a more expansive understanding of justice, one that places personal liberty and human dignity at the centre of constitutional interpretation.
- **Dissent as a Shield Against State Overreach**
  - Dissent, as a constitutional value, is vital not only for challenging state overreach but also for enriching public discourse.
  - It acts as a counterweight to the centralisation of power, ensuring that diverse perspectives are heard and respected.
  - This principle resonates with B.R. Ambedkar's vision of the Constitution as a dynamic document capable of holding the country together by accommodating differing views and fostering a culture of dialogue.
- **Beyond Judicial Rulings**
  - However, the role of dissent in constitutional ethics extends beyond judicial pronouncements.
  - It requires an active commitment from all branches of government and civil society to protect and promote the right to dissent.
  - The Preamble to the Constitution, with its emphasis on justice, liberty, equality, and fraternity, provides a moral compass for navigating conflicts and ensuring that dissent is not criminalised or suppressed.

#### **The Paradox of Dissent in Contemporary India**

- **Despite the judiciary's recognition of dissent as a constitutional value, its criminalisation has intensified in recent years.**
- **Preventive detention, arbitrary arrests, and the denial of fair trials have become tools to suppress dissent.**
- The experiences of activists like Umar Khalid, Sharjeel Imam, and Gulfisha Fatima jailed for their resistance to the Citizenship (Amendment) Act (CAA).
- **It echoes the struggles of A.K. Gopalan, who faced imprisonment and re-arrest under colonial and post-independence laws.**
- **The irony lies in the fact that laws originally designed to uphold colonial rule have been repurposed to stifle dissent in independent India.**
- **The notion that 'the process has become the punishment' aptly describes the plight of contemporary dissenters.**

#### **Lessons from the Journey of Constitutional Governance in India: The Role of Judiciary**

- **The Ethical Responsibility of Courts**
  - **The judiciary, as the guardian of constitutional values, has an ethical responsibility to protect personal liberty and dissent.**
  - While the Supreme Court has, in some instances, demonstrated a commitment to these principles—such as in the Puttaswamy judgment, **it has often fallen short in addressing systemic issues.**
  - The **reluctance to grant bail to dissenters**, the deferment of crucial hearings, and the endorsement of broadly worded anti-terror laws **contribute to a culture of impunity.**
  - This **underscores the necessity for "creative constitutionalism,"** a term coined by Professor Upendra Baxi, which advocates for an imaginative and justice-oriented interpretation of constitutional provisions.
- **Avoiding Historical Repetition**
  - The failure to learn from history risks repeating its mistakes.
  - **K. G. Kannabiran's observation that the Gopalan judgment represented an "Indian-made foreign judgment"** is a sobering reminder of how colonial laws and mindsets have persisted in post-independence India.
  - Seventy-five years after the adoption of the Constitution, **the judiciary has an opportunity to correct this legacy by ensuring that laws are interpreted and applied** in ways that further justice rather than perpetuate oppression.
  - **The Constitution must not be allowed to become a tool for state control;** instead, it must remain a beacon of hope for those who challenge injustice.



- **Upholding Justice as the Constitution's Ultimate Goal**

- The **essence of creative constitutionalism lies in its commitment to justice** as the ultimate goal of the Constitution.
- **Ambedkar envisioned the Constitution as a living document** capable of adapting to the needs of a dynamic society.
- To honour this vision, **courts must actively engage with the ethical dimensions of constitutional interpretation**, prioritising human dignity and liberty over procedural rigidity.
- By doing so, **the judiciary can ensure that the Constitution remains a transformative force that empowers citizens and safeguards democracy.**

**The Path Forward: Creative Constitutionalism**

- Creative constitutionalism calls for a **departure from rigid proceduralism and an embrace of judicial innovation to uphold the ethical spirit of the Constitution.**
- This **involves interpreting fundamental rights expansively**, prioritising personal liberty, and ensuring that laws and state actions align with constitutional values.
- **Courts must actively address the misuse of preventive detention laws and anti-terror statutes**, ensuring that these measures are not used to stifle dissent or target marginalised communities.
- Additionally, **the judiciary must develop a culture of urgency in cases involving personal liberty, recognizing that delayed justice often amounts to denied justice.**

**Conclusion**

- **The Constitution of India represents a vision of justice, equality, and liberty** that transcends generations.
- **However, its promise remains unfulfilled** as long as dissent is criminalised and personal liberty is compromised.
- **The struggles of past and present dissenters** serve as a stark reminder of **the distance yet to be traversed.**
- **By embracing creative constitutionalism** and prioritising the dignity and liberty of individuals, **India can move closer to realising the transformative potential of its Constitution.**

## 7. India – Indonesia Bilateral Relationship

**Why in the News?**

Indonesian President Prabowo Subianto arrived in India ahead of the **76th Republic Day celebrations in New Delhi, where he will be the chief guest.**

**India – Indonesia Bilateral Relationship:**

- **Historical and Cultural Bonds:**
  - India and Indonesia share a relationship that spans over two millennia, rooted in **deep cultural and historical ties.**
  - **Hinduism, Buddhism, and later Islam travelled to Indonesia from India**, shaping its cultural and religious landscape.
  - The epics **Ramayana** and **Mahabharata** continue to influence Indonesian art and folklore, creating a unique cultural connection.
  - Post-independence, both nations shared aspirations for political sovereignty, economic self-sufficiency, and independent foreign policies, becoming significant voices in the **Non-Aligned Movement.**

**Strategic and Diplomatic Engagements:**

- **High-Level Visits and Agreements:**
  - **2018:** Prime Minister Narendra Modi's visit to Jakarta led to the signing of the Comprehensive Strategic Partnership and a shared vision on Indo-Pacific maritime cooperation.



- **2024:** Prime Minister Modi and Indonesian President Prabowo Subianto held discussions on the sidelines of the G20 Summit, emphasizing economic and security cooperation.
- These engagements underline mutual commitment to regional stability and economic growth.
- **Defense and Security Cooperation:** India and Indonesia have a long-standing defense relationship, formalized in 1951 and further strengthened by agreements in 2001 and 2018. Key initiatives include:
  - **Joint Military Exercises:** Exercises like **Garuda Shakti** (Army), **Samudra Shakti** (Navy), and coordinated patrols (**IND-INDO CORPAT**).
  - **Defense Industry Collaboration:** The inaugural India-Indonesia Defense Industry Exhibition in 2024 showcased opportunities for cooperation in defense technology and manufacturing.
- This partnership highlights shared concerns over **regional security, particularly in the Indo-Pacific**.

#### **Economic and Trade Relations:**

- **Bilateral Trade: Indonesia is India's second-largest trading partner in ASEAN.** Trade between the two nations was **\$29.4 billion in 2023-24**, driven by:
  - **Indian Imports:** Coal, crude palm oil, and rubber.
  - **Indian Exports:** Refined petroleum, telecommunication equipment, and agricultural products.
- **Investment and Connectivity:**
  - **Indian Investments:** Indian businesses have invested over \$1.56 billion in sectors like mining, textiles, and infrastructure.
  - **Connectivity Boost:** Direct flights between major cities like Mumbai-Jakarta and Delhi-Bali have strengthened people-to-people ties and boosted tourism.
- **Cultural and Educational Collaboration:**
  - **Cultural Engagement:** India operates two cultural centres in Jakarta and Bali, promoting yoga, classical dance, and music.
  - **Educational Cooperation:** Indonesia is a key recipient of Indian scholarships under programs like ITEC and ICCR. Discussions on higher education MoUs aim to deepen collaboration in knowledge sharing.
- **Multilateral Cooperation:**
  - India and Indonesia are active participants in multilateral forums like the **G20, ASEAN, and IORA**.
  - Their partnership extends to maritime security, sustainable development, and regional stability.
- **Future Prospects:**
  - India and Indonesia commemorate 75 years of diplomatic relations in 2024, with numerous initiatives celebrating their shared history and future aspirations.
  - Strengthening trade, defense, and cultural cooperation remains central to their relationship, ensuring mutual growth and stability in the Indo-Pacific.

#### **Conclusion:**

- The **India-Indonesia bilateral relationship exemplifies a blend of historical camaraderie and strategic collaboration**.
- As two vibrant democracies and emerging economies, their partnership is pivotal in shaping the regional and global landscape.
- With shared values and mutual respect, India and Indonesia continue to deepen their ties, fostering a prosperous and peaceful future.

## **8. The U.S. Withdrawal from WHO: Implications for Global Health**

### **Why in the News?**

On his first day in office, **President Donald Trump signed an executive order withdrawing the U.S. from the World Health Organization (WHO)**.



### What's in Today's Article?

- Background (Context of the Article)
- About the **Withdrawal (Reasons, Implications, Consequences for US, Challenges for WHO, etc.)**

#### Background:

- President Donald Trump signed an executive order to withdraw the United States from the WHO.
- This decision marks the second attempt by Trump to exit the global health body, citing dissatisfaction with WHO's management during the COVID-19 pandemic, perceived political biases, and disproportionate financial burdens placed on the U.S.
- **Trump had initially announced a withdrawal during his first term in 2020. However, this was reversed by then-President Joe Biden in 2021.**
- The new executive order revives the debate, calling into question the role of the U.S. in global health diplomacy and its commitment to multilateralism.

#### Key Reasons for the Withdrawal:

- **Mishandling of the COVID-19 Pandemic:**
  - Trump criticized WHO's delayed response to the pandemic and its handling of China's accountability in the initial stages of the outbreak.
- **Perceived Political Bias:**
  - The administration accused WHO of being overly influenced by certain member states, including China.
- **Financial Burden:**
  - The U.S. contributes the highest assessed membership dues, ranging between \$100 to \$122 million annually, and nearly \$1.3 billion in voluntary funding in 2022-2023.
  - **Trump labelled this burden "unfair" when compared to China's significantly lower contributions.**

#### Immediate Actions Outlined in the Executive Order:

- **Halt in U.S. Funding:** Immediate cessation of all financial transfers to WHO.
- **Personnel Withdrawal:** Recall of U.S. government employees working with WHO.
- **Development of Alternatives:** Identification of credible domestic and international partners to replace WHO's functions.
- **Pandemic Treaty Exit:** Discontinuation of negotiations on the WHO's pandemic treaty, a framework aimed at improving global pandemic responses.

#### Implications of the Withdrawal:

- **Financial Strain on WHO:**
  - The U.S. contributes nearly 20% of WHO's funding. Losing this would severely impact the organization's ability to support health programs, including vaccine development, eradication of diseases like polio, and pandemic preparedness.
- **Program Disruptions in Developing Nations:**
  - WHO aids various global health programs, including India's immunization and disease surveillance efforts. Reduced funding could hinder these initiatives, particularly in low-resource countries.
- **Loss of Expertise:**
  - The withdrawal would sever collaboration between WHO and U.S. institutions like the CDC, which are instrumental in global health surveillance and response.

#### Domestic Consequences:

- **Limited Access to Global Health Data:**
  - The U.S. would lose access to critical information on **emerging infectious diseases, potentially leaving the country vulnerable to new health threats.**

- **Vaccine Preparedness:**

- Exiting the WHO could impact access to influenza strain samples, essential for producing effective vaccines, leading to increased hospitalizations and deaths from preventable diseases like the flu.

- **Reduced Influence in Global Health Policy:**

- By withdrawing, the **U.S. would relinquish its leadership role, creating a vacuum likely to be filled by countries like China.** This shift could reduce America's diplomatic leverage in international health.

**Geopolitical Shifts and the Role of Emerging Economies:**

- The **S. withdrawal may pave the way for greater involvement from China and the Global South, including India.**
- China has already pledged \$30 million in additional funding to WHO, a move likely to strengthen its influence in global health governance.
- Experts suggest this is an opportunity for India and other emerging economies to step up.
- **India's leadership in vaccine production and its positioning as the "voice of the Global South" can play a pivotal role in shaping a balanced global health framework.**

**Challenges for WHO:**

- WHO faces significant internal criticisms, including **slow responses to health crises and inefficiencies in implementing reforms.**
- While funding cuts may exacerbate these issues, experts argue that constructive engagement rather than withdrawal is a better strategy to drive meaningful reform within the organization.

**Way Forward:**

- **Judicial Clarity:**
  - Legal experts question the constitutionality of Trump's decision, suggesting Congressional approval may be required for withdrawal.
- **Reforming WHO:**
  - WHO must address inefficiencies, improve transparency, and speed up emergency response protocols to regain trust and maintain global health leadership.
- **Strengthened Collaboration with Emerging Economies:**
  - Nations like India and South Africa should collaborate to fill the financial and strategic gap left by the U.S. withdrawal.

## 9. Trump 2.0 and Challenges for India

**Why in news?**

President Donald Trump, in his inaugural speech for a second term, announced a "revolution of common sense" to shift America away from "**liberal extremism**" and "**declinist pessimism.**"

Criticizing the "corrupt establishment" for domestic and international crises, he promised bold changes in immigration, trade, free speech, identity politics, and environmental mandates.

Trump reaffirmed support for **taxing imports to boost domestic manufacturing** and introduced plans for an External Revenue Service to handle taxes on imports, complementing the Internal Revenue Service.

**General nature of India-US relations**

- **Historical Context of India-US Relations**
  - India-US relations have evolved over decades, overcoming challenges and building partnerships:
    - **Prime Minister Vajpayee:** Called the nations "natural allies," emphasizing shared values and geopolitical interests.
    - **President Obama:** Defined the partnership as "a defining relationship of the 21st century."





- **Prime Minister Modi:** Asserted in 2016 that the partnership had overcome historical hesitations to form a long-term alliance.
- **Economic and Trade Cooperation**
  - **Trade Relations:** The US is India's largest market for goods and services.
  - **FDI:** US foreign direct investment in India was \$51.6 billion in 2022.
  - **WTO Disputes:** Both nations resolved seven pending disputes, strengthening trade ties.
- **Technological and Strategic Collaboration**
  - India and the US cooperate in critical areas of technology and innovation, including:
    - **Advanced Technologies:** Blockchain, clean energy, cyber sciences, and space exploration.
    - **Health and Agriculture:** Collaboration on health security and agricultural advancements.
    - **Strategic Trade Authorization:** India's elevation to Tier 1 status in 2018 allowed it licence-free access to regulated US technologies.

### India-US Relations Under Trump 1.0

- During Donald Trump's first term, India and US enjoyed a strong relationship marked by personal rapport between PM Narendra Modi and President Trump.
- **Key highlights include:**
  - **Reviving the Quad initiative.**
  - Renaming the **US Pacific Command to the US Indo-Pacific Command.**
  - Recognizing India's emergence as a global power and strategic partner in the Indo-Pacific region.

### Trump's Vision for a Thrilling New Era

- President Donald Trump, in his second inaugural address, unveiled a bold agenda to transform America's domestic and foreign policies.
- He emphasized reversing liberal policies and advancing an **"America First" agenda to restore national sovereignty, renew traditional values, and bolster economic and military strength.**
- **Economic Revival and Energy Independence**
  - Trump vowed to rebuild the U.S. economy by **reducing inflation and removing environmental constraints on growth.**
  - He plans to expand energy production, including drilling for oil, and gut climate controls, aligning with the priorities of his election supporters.
- **Foreign Policy: Assertive and Transactional**
  - Rejecting isolationism, Trump promised to **prioritize defending U.S. borders over distant conflicts while taking a "peacemaker" stance abroad.**
  - His policies aim to reclaim global primacy with a focus on strategic interests, including assertive claims on the Panama Canal and renaming the Gulf of Mexico as the "Gulf of America."

### Challenges for India

- India, which has shared strong ties with the U.S. in recent decades, must prepare for a **transactional relationship** under Trump.
- Trade, immigration, and internal reforms in India will play a critical role in navigating this new dynamic.
- **Indian Markets Brace for Trump's Presidency**
  - As Donald Trump assumes office as the 47th President of the United States, Indian markets are taking a cautious stance.
  - While Trump's election in November spurred a Sensex rally of over 900 points, market participants are now adopting a "wait and watch" approach, given uncertainty around his policy announcements.
- **Potential Drivers and Market Impacts**
  - **Tax Cuts as a Catalyst:** The forthcoming Budget and potential tax rate reductions are expected to play a pivotal role in market movements.



- **Trump's Tariff Policies:** While Trump has hinted at raising tariffs, the extent remains unclear. Policies impacting China negatively could benefit Indian markets indirectly.
- **Dollar and Rupee Trends:** The weakening dollar and rupee-dollar trade dynamics are key factors to watch.
- **India's Strategic Autonomy and Challenges**
  - While India benefits from U.S. support, it will also seek to maintain strategic autonomy, balancing regional security concerns with its diplomatic partnerships, including with Russia.
  - India is likely to resist excessive alignment with the U.S., seeking continuity in initiatives like the Quad while managing the cost-benefit expectations of Trump's administration.

### Conclusion

Indian markets remain cautious as Trump's policies and their implications unfold. For now, the Budget, tax cuts, and currency trends are likely to be the main market drivers, while Trump's agenda will be assessed as clarity emerges.

## 10. An Alliance of Democracies, With India at its Core

### Context

- The **year 2024, marked by critical elections worldwide**, set the stage for 2025 to become a pivotal moment for democracies to regroup and strengthen their alliances.
- Among these, **the relationship between Europe and India stands out as an essential partnership** that has long been rich in strategies but **poor in tangible outcomes**.
- **Both entities must seize the opportunity to redefine their collaboration**, focusing on practical measures that align economic, technological, and security interests.

### The First Step Towards Redefining EU-India Relations

- **Moving Beyond Trade Negotiations**
  - **For nearly two decades, EU-India relations have been primarily defined by the pursuit of a Free Trade Agreement (FTA)**, with little progress to show.
  - While such an agreement between the world's largest democracy and the EU, **the largest trading bloc, could be transformative, hurdles persist**.
  - The **focus must shift from the technicalities of trade negotiations to higher-level strategic priorities**.
  - These **include economic security, defence cooperation, and partnerships in emerging technology and critical industries** like pharmaceuticals and space exploration.
- **A Shared Understanding of Geopolitical Realities**
  - **India's historical ties with Russia** and pragmatic engagement with China **have often frustrated Europe**, especially in light of Russia's invasion of Ukraine.
  - However, **India's approach reflects its broader aim to avoid being drawn into the binary division** of democratic versus autocratic blocs.
  - While its democratic foundations make its alignment with Moscow and Beijing seem incongruous, **Europe must acknowledge its own double standards**, particularly its economic reliance on China.
  - **A reset in EU-India relations requires a shared understanding of the challenges** posed by the Russia-China partnership.
  - **Both are strategic threats to the global democratic order**, making it imperative for India, Europe, and the United States to align their priorities.
  - **Recognising the interconnectedness of events in the Atlantic and Indo-Pacific regions, Europe and India must take concrete steps** to enhance trade and security while reducing dependence on China.

### Some Other Crucial Areas for India-EU Cooperation

- **Strengthening Defence and Security**



- **India's strong defence ties with the United States**, particularly as a 'Major Defence Partner' and member of the Quad, **provide a model for Europe**.
- **The EU should enhance its own defence collaboration with India**, offering advanced technologies and investments in place of Russia's outdated options.
- **Appointing a dedicated EU Defence Commissioner to engage with India could accelerate progress** in this domain.
- **Space exploration is another area** of potential cooperation, given the ambitious plans of both the EU and India.
- **By developing joint ventures and shared investments in this field, the partnership can achieve significant breakthroughs**, further solidifying their strategic alignment.
- **Leveraging Technology Collaboration**
  - The **establishment of the EU-India Trade and Technology Council (TTC) mirrors similar initiatives with the United States**, such as the U.S.-India Critical and Emerging Technology initiative (iCET).
  - **These frameworks are essential for coordinating technology agendas and tackling global challenges**, particularly in emerging technologies like quantum computing and advanced biotech.
  - The **competition in these sectors is intense, with China leading in 57 of the top 64 emerging technologies**, according to the Australian Strategic Policy Institute.
  - **India and Europe, alongside the U.S., must pool resources and expertise to maintain their competitive edge**.
  - **By focusing on collaborative research and innovation, these democratic partners can position themselves as global leaders** in critical technologies.

#### **The Way Forward to a Robust EU-India Partnership**

- **Strengthening Economic Ties**
  - The **economic potential of an EU-India partnership is immense. India is on track to become the world's third-largest economy** in the next decade, offering a dynamic market for European businesses seeking growth beyond their borders.
  - Conversely, **Europe's advanced industrial capabilities and access to cutting-edge technology provide India with opportunities to modernise its economy** and industries.
  - **To facilitate these opportunities, both parties must break down barriers** to trade and investment.
  - The **EU and India should prioritise sectors with mutual benefits**, such as green energy, pharmaceuticals, advanced manufacturing, and digital innovation.
- **Deepening Cultural and Educational Exchanges**
  - **Europe and India must enhance cultural, academic, and professional exchanges** to build trust and mutual understanding.
  - **Programs that promote student and faculty exchanges between European and Indian universities can create a generation of leaders** with firsthand knowledge of both regions.
  - **Similarly, professional training programs and labour mobility agreements can address skills gaps in Europe** while providing employment opportunities for India's vast pool of talented professionals.
  - **Facilitating visa access and streamlining processes** for work and study permits **will further encourage these exchanges**.
- **Enhancing Collaboration on Global Challenges**
  - The EU and India share common concerns about climate change, public health, and global security, **making collaboration on these issues a practical necessity**.
  - For example, **joint initiatives in renewable energy development can help accelerate the transition to a green economy**.
  - **Europe's leadership in clean technologies, coupled with India's ambitious renewable energy targets**, offers a perfect opportunity for collaboration.
  - In public health, **the COVID-19 pandemic underscored the importance of global partnerships in developing and distributing vaccines**.



- **India, as a pharmaceutical manufacturing powerhouse, and Europe, with its strong research and regulatory infrastructure, can work together to improve global health security.**
- **Creating a Model Partnership**
  - **The ultimate goal of building practical connections is to create a model partnership** that other democracies can emulate.
  - By demonstrating how regions with different historical and cultural contexts can work together effectively, **Europe and India can inspire other nations to forge similar alliances.**
  - **In this effort, both sides must commit to regular engagement at all levels**—political, economic, and social.
  - **High-level summits, business forums, and cultural festivals should be complemented by grassroots initiatives** that connect communities and individuals.
  - This **multi-level approach will ensure that the EU-India partnership is not just a strategic alliance but a living, dynamic relationship grounded in mutual respect** and shared aspirations.
- **Bridging Democratic Challenges**
  - **Both Europe and India face challenges** in maintaining and **strengthening their democratic institutions.**
  - **By working together, they can learn from each other's experiences** and develop strategies to address issues like polarization, misinformation, and the erosion of civil liberties.
  - **Forums for democratic dialogue, including joint research initiatives** and policy workshops, **can create mutual learning and innovation in democratic governance.**

#### Conclusion

- **Europe, India, and the United States are individually influential, but their collective power is unparalleled** in countering autocratic forces.
- **By prioritising strategic cooperation in defence, technology, and economic security, the EU-India partnership can evolve into a cornerstone of global democratic stability.**
- This is **not just a necessity for these regions but a vital step in shaping a future where democracies lead the way.**

## 11. The Collegium and Changes, It May Still Be Early Days

#### Context

- The recent developments concerning the Supreme Court of India's Collegium system have rekindled **debates** about its effectiveness and necessity for reform.
- Two **noteworthy resolutions have come to light: the Collegium's decision to conduct interviews of candidates for High Court judgeships and its intention to limit the selection of candidates** with close familial ties to existing judges.
- However, **these steps, laudable as they might be, must be viewed alongside the long-standing concerns surrounding the Collegium's structure, transparency, and its interplay with the executive branch.**

#### Evolution of the Collegium System

- The Collegium system **owes its existence to judicial interpretations rather than constitutional directives.**
- Envisioned as a mechanism to safeguard judicial independence, **it emerged from the Second Judges Case (1993), where the Supreme Court interpreted 'consultation' in Article 124 of the Constitution to mean 'concurrence' by a Collegium** comprising the Chief Justice of India (CJI) and senior judges.
- This decision **aimed to protect judicial appointments from undue executive influence, establishing the judiciary as a self-regulating institution.**

#### A Deeper Examination of Challenges to Collegium's Effectiveness

- **Opacity in Functioning**



- The **decision-making process is conducted behind closed doors**, with no formal minutes or publicly available records of deliberations.
- **This secrecy undermines public trust** in the judiciary and creates an environment where allegations of favouritism, nepotism, and bias can thrive.
- The **absence of clear criteria for evaluating candidates further complicates this issue**, leaving the process vulnerable to subjectivity and inconsistency.
- **Executive Interference and Delays**
  - Despite the judiciary's primacy in appointments, **the executive wields significant power to delay or obstruct Collegium recommendations**.
  - The **government can employ various tactics to impede the process**, such as:
    - The **executive often sits on recommendations indefinitely**, neither rejecting nor approving them.
    - This **stalling tactic creates uncertainty** and undermines judicial efficiency.
    - The **government may cherry-pick recommendations**, accepting some while returning others for reconsideration without adequate justification.
- **Nepotism and Lack of Diversity**
  - **Judges are often accused of favouring candidates** with familial or professional ties to existing members of the judiciary.
  - This **practice limits opportunities for deserving candidates** from diverse backgrounds, leading to a judiciary that is not representative of the broader society.
  - **While the recent resolution to exclude candidates with close familial ties to serving judges is a step in the right direction**, its implementation remains uncertain.
  - Moreover, **excluding candidates solely based on familial connections may inadvertently disqualify highly competent individuals**, highlighting the need for nuanced reforms.
- **Absence of Binding Rules**
  - The Collegium **operates without a codified set of rules**, relying instead on informal practices and traditions.
  - This **lack of a binding framework creates inconsistencies** in its functioning. For example, there is no guarantee that the Collegium under different Chief Justices of India (CJIs) will adhere to the same standards or priorities.
  - **This ad hoc approach not only undermines predictability but also makes the system vulnerable to manipulation**.

#### **Attempts to Reform the Collegium System and SC Verdict on It**

- The **National Judicial Appointments Commission (NJAC) Act, 2014** sought to replace the **Collegium System** with a commission, for the purpose of appointment and transfer of judges in the **Supreme Court** and **High Courts** of India.
- The act aimed to make the process of judicial appointments more transparent and accountable.
- However, the **Constitution Bench** (4:1 majority) of the SC struck down the NJAC Act and the 99th Constitutional Amendment as unconstitutional.
- The Court reinstated the collegium system, emphasizing the importance of judicial independence.

#### **Proposals to Reform the Collegium System**

- **Introduction of Candidate Interviews**
  - The **decision to interview candidates for High Court judgeships aims to provide a more holistic evaluation**
  - **Interviews can help assess a candidate's judicial temperament**, ethical outlook, and understanding of constitutional principles, which are not always evident from written records.
  - **This reform can create merit-based appointments** by ensuring that candidates' skills, perspectives, and values align with the judiciary's needs.
- **Addressing Nepotism**
  - By discouraging the selection of candidates with close familial ties to serving judges, the Collegium seeks to enhance diversity and meritocracy in judicial appointments.



- This move could break entrenched power structures within the judiciary, opening the door for individuals from diverse backgrounds, including first-generation lawyers and underrepresented communities.
- **Codification of Collegium Processes**
  - Formalising the Collegium's functioning through a codified set of rules is essential to ensure consistency and predictability.
  - **A clear framework outlining eligibility criteria**, selection processes, and timelines can **eliminate ambiguities and reduce discretionary decision-making**.
  - Codification would bring much-needed structure to the Collegium's operations, making it more transparent and less susceptible to allegations of arbitrariness.
- **Time-Bound Approvals**
  - **Instituting a fixed timeline for the government** to act on Collegium recommendations **would address delays in judicial appointments**.
  - This **could include binding deadlines** for either accepting or returning recommendations with detailed reasons.
  - **Such a mechanism would reduce judicial vacancies**, alleviate case backlogs, and improve overall efficiency in the judiciary.
- **Transparency Through Public Disclosures**
  - **Publishing detailed justifications for appointments and rejections could enhance public trust**.
  - This **includes disclosing reasons for selecting certain candidates and rejecting others**, as well as addressing concerns raised during the selection process.
  - **Transparency would not only bolster accountability but also deter frivolous challenges** to the Collegium's decisions.
- **Independent Oversight Mechanism**
  - **Establishing an independent body to oversee the implementation of Collegium** recommendations and address disputes between the judiciary and the executive could **improve accountability without compromising independence**.
  - Such a body could act as a mediator, ensuring that the judicial appointment process adheres to constitutional principles while resolving conflicts collaboratively.

#### **The Way Forward to Ensure the Success of the Reforms**

- **Comprehensive Consultations:** Engaging stakeholders, including senior judges, legal experts, and civil society, in drafting codified rules to ensure inclusivity and legitimacy.
- **Capacity Building:** Strengthening administrative infrastructure to handle the additional demands of a reformed appointment process.
- **Enforcement Mechanisms:** Introducing legal provisions to penalize non-compliance with timelines or procedural lapses by the executive.
- **Periodic Reviews:** Conducting regular assessments of the Collegium's functioning to identify and address emerging challenges.

#### **Conclusion**

- Post the NJAC judgment, the **Collegium System continues to be the method for appointing judges to the higher judiciary**.
- **The Collegium system**, despite its flaws, **represents an effort to preserve the judiciary's independence**.
- **However, its survival and efficacy depend on meaningful reforms** that address both structural and procedural deficiencies.

## **12. The Debate on Cash Transfers: Freebies or Greater State Investment in Reforms**

### **Context**



- **Cash transfers have long been part of social protection schemes across the globe**, designed to address specific challenges like poverty, health access, and education.
- **India's National Social Assistance Programme (NSAP)**, one of the oldest cash transfer initiatives, exemplifies this by providing pensions to vulnerable populations such as the elderly, widowed, and disabled.
- However, recent trends reveal that cash transfers have evolved from targeted safety nets to political tools used as a panacea for a wide array of social and economic challenges.
- While they have gained popularity among political parties, their efficacy in addressing underlying issues remains questionable.

#### The Rise of Cash Transfers in Indian Politics

- In recent years, cash transfer schemes have become a favoured strategy for political parties to secure electoral success.
- For instance, incumbent governments in Maharashtra and Jharkhand successfully utilised cash transfer schemes targeted at women voters, contributing significantly to their re-election.
- Similarly, states like Telangana and Odisha adopted cash transfers to address agrarian distress, a model later expanded by the central government through the PM-KISAN scheme in 2019.
- These schemes have since been extended to tackle unemployment, with several states implementing or promising direct financial assistance for the unemployed.
- The appeal of cash transfers lies in their simplicity and immediacy.
- With the expansion of financial inclusion, these schemes are easy to implement and provide direct, tangible benefits to voters, bypassing bureaucratic inefficiencies and middlemen.
- Additionally, their fungible and unconditional nature makes them highly attractive to beneficiaries.
- For politicians, they offer a direct connection with the electorate, enhancing their popularity and electoral prospects.

#### Arguments Against the Cash Transfer Policy: The Problematic Assumptions

- **Cash Transfers Solve Root Problems**
  - A prevalent belief is that direct financial assistance can effectively resolve issues like poverty, unemployment, and agrarian distress.
  - However, this assumption overlooks the multi-dimensional nature of these problems.
  - Poverty, for instance, is influenced by factors such as lack of education, inadequate healthcare, and limited access to infrastructure.
  - Similarly, agrarian distress arises from systemic challenges, including outdated farming techniques, volatile markets, and inadequate policy support.
  - Cash transfers provide temporary relief but fail to address the structural issues underlying these crises.
- **Universality Equals Effectiveness**
  - Another flawed assumption is that cash transfers, being fungible and universal, inherently meet the diverse needs of beneficiaries.
  - While their unconditional nature provides flexibility, it also limits their capacity to address specific issues effectively. For example, a farmer receiving cash under an agrarian distress scheme might use it for immediate household expenses rather than investing in agricultural inputs or modern equipment.
  - Similarly, unemployed youth might use funds for consumption rather than skill development or entrepreneurship.
  - The universal application of cash transfers disregards the varied and nuanced needs of different demographic groups.
- **Cash Transfers Bypass Bureaucratic Inefficiencies**
  - While cash transfers do circumvent some layers of bureaucracy and reduce the role of intermediaries, they are not immune to implementation challenges.

- **Issues such as exclusion errors, where eligible beneficiaries are left out, and inclusion errors, where ineligible individuals receive benefits, are common.**
- These errors **undermine the fairness and effectiveness of such schemes.**
- Additionally, **the dependence on robust financial infrastructure and digital literacy excludes marginalised populations**, particularly in rural areas where access to banking services remains limited.
- **Political Success Equals Policy Success**
  - Perhaps the **most problematic assumption is the conflation of political and policy success.**
  - The **electoral gains achieved through cash transfers are often seen as evidence** of their effectiveness.
  - However, **this ignores the broader metrics of success**, such as improvements in human development indicators, economic growth, or social equity.
  - **Political parties focus on the immediate popularity boost from cash transfers** without evaluating their long-term impact or sustainability.

### Arguments Supporting the Cash Transfer Policy

- **Empowering Women Through Direct Transfers**
  - India's performance in global indices of gender equality reveals a stark reality.
  - Ranked 129 out of 146 countries in the 2023 Global Gender Gap report, India has seen a declining trend in women's workforce participation despite robust economic growth.
  - **Direct cash transfers to women have shown promise in dismantling barriers to education, employment, and dignified living.**
  - For instance, **the Delhi government's 2019 initiative of free bus rides for women resulted in a 24% increase in employment among women** from marginalized communities, as reported in a 2023 independent study.
  - This **program illustrates how targeted subsidies can empower women by providing affordable mobility**, a critical factor in accessing work and education.
- **Broader Impact on Society**
  - Over the last decade, **the Delhi government has introduced multiple subsidies, such as free electricity and water**, aimed at enhancing the quality of life for lower- and middle-income groups.
  - **These measures not only act as social safety nets but also stimulate economic demand** by boosting purchasing power.
  - **Contrary to fears of misuse**, global evidence suggests that beneficiaries of cash transfers prioritise essential expenses such as nutrition, education, and healthcare.
  - **A study across 119 developing countries found recipients of unconditional cash assistance programs improved their quality of life significantly**, underscoring the utility of such schemes in addressing poverty and inequality.
- **Balancing Welfare with Development**
  - The **concern that welfare schemes might divert resources** from critical investments in infrastructure and human capital is **valid but context-dependent.**
  - The **Delhi Model provides an instructive case.** Approximately 40% of its annual budget is allocated to health and education, leading to significant improvements in these sectors.
  - **Delhi now boasts some of the best government schools** and public healthcare systems in India.
  - **Simultaneously, the state has made significant strides in infrastructure development**, from doubling the Delhi Metro's length to expanding green mobility through e-buses.
  - **These achievements demonstrate that welfare schemes and developmental investments can coexist**, provided there is prudent fiscal management.

### Way Forward: Rethinking the Assumptions

- The **problematic assumptions** underpinning the over-reliance on cash transfers **highlight the need for a paradigm shift in policy design.**





- **Cash transfers should be viewed as one component of a broader strategy**, complementing investments in infrastructure, education, healthcare, and social services.
- **Policymakers must recognise that sustainable solutions require time, effort, and collaboration** across stakeholders.
- **Without addressing these flawed assumptions, cash transfers risk becoming a superficial fix** rather than a transformative tool for development.

#### Conclusion

- While cash transfers have their merits, **their overuse as a political tool risks undermining the very objectives they aim to achieve.**
- **The need of the hour is a more balanced understanding** of the role of cash transfers in social welfare.
- Rather than being viewed as quick-fix solutions, **they should be integrated into broader strategies aimed at strengthening social safety nets and addressing systemic issues.**
- **This requires prioritising investments in critical sectors and designing interventions that go beyond electoral gains** to achieve sustainable development outcomes.

### 13. Tackling Delimitation by Reversing Population Control

#### Context

- In recent years, **the Chief Ministers of Andhra Pradesh and Tamil Nadu have voiced concerns over the implications of the proposed delimitation** exercise and the potential loss of parliamentary seats for southern states.
- **This development, driven by the south's advanced fertility transition, highlights a complex intersection of demography, politics, and regional equity.**
- The **debate sheds light on the challenges of balancing population trends with political representation**, alongside broader questions about fertility policies and their socio-economic impact.

#### Fertility Transition and Political Representation

- **Fertility Transition**
  - **The southern states of India**, including Andhra Pradesh and Tamil Nadu, **have excelled in achieving lower fertility rates**, reflecting successful family planning initiatives.
  - However, **this demographic success inadvertently poses a political disadvantage.**
  - **The delimitation exercise**, which adjusts parliamentary representation based on population, **could reduce the number of seats for states with declining populations**, thereby diminishing their political influence.
  - **This issue underscores a fundamental tension in India's federal structure:** the ideal of "one person, one vote" clashes with the reality of demographic disparities.
- **The Debate on Political Representation**
  - **As Mr. Naidu and Mr. Stalin have pointed out, this dynamic can create perverse incentives**, encouraging policies that promote higher fertility to preserve political representation.
  - **While Mr. Naidu suggested revisiting policies that incentivise larger families**, Mr. Stalin humorously proposed aiming for significantly more children.
  - **These remarks highlight the absurdity and complexity of addressing regional imbalances** in political representation through demographic measures.

#### Lessons from Global Experiences

- **International examples**, such as China's one-child policy, **offer critical insights into the unintended consequences of fertility regulation.**



- While China successfully curbed population growth, **the policy led to significant challenges, including a skewed sex ratio**, a rising dependency burden, and an irreversible decline in fertility rates.
- **Similarly, countries like Japan and South Korea**, despite implementing pro-natalist policies, **have struggled to reverse declining fertility trends**.
- These cases demonstrate that fertility transitions, once achieved, are rarely reversible through state intervention.
- **India must tread cautiously to avoid repeating such mistakes. Quick-fix regulatory measures aimed at increasing fertility could disrupt the natural demographic transition**, creating long-term socio-economic and cultural challenges.

### The Debate on Demographic Disparity: Challenges and Implications

- **The North-South Demographic Divide**
  - **The southern states**, including Tamil Nadu, Andhra Pradesh, Kerala, and Karnataka, **have undergone significant demographic transitions over the past decades**.
  - These states have achieved lower fertility rates, higher literacy levels, better healthcare outcomes, and robust economic growth.
  - This is **largely due to sustained investments in education, family planning, and infrastructure**, alongside proactive governance.
  - In contrast, **many northern states, such as Uttar Pradesh, Bihar, Madhya Pradesh, and Rajasthan, continue to grapple with higher fertility rates**, lower literacy levels, and slower socio-economic progress.
  - **This demographic divide has led to an uneven population growth trajectory**, with northern states accounting for a larger share of India's overall population.
- **Increasing Debate on Political Representation**
  - When parliamentary representation is determined solely by population size, **the southern states stand to lose seats due to their slower population growth**, while the northern states gain political clout.
  - **This imbalance creates a paradox where states that have achieved population stabilisation and socio-economic development are penalised**, while those with higher population growth are rewarded.
- **Implications for Federal Equity**
  - This **demographic disparity poses significant challenges to the principles of federal equity**.
  - **Southern states**, which contribute disproportionately to India's GDP and have lower dependency burdens, **may feel marginalised if their political representation diminishes**.
  - **This could lead to a sense of alienation and undermine the cooperative spirit** necessary for India's federal system to function effectively.
  - **At its core, the issue raises a critical question: should population size alone determine political representation**, or should other factors, such as a state's developmental achievements and contributions to national growth, also be considered?
- **Gendered Implications**
  - **Encouraging higher fertility rates raises critical questions** about the role of women in society and women bear the brunt of reproduction, often at significant personal and professional costs.
  - **Policies aimed at reversing fertility decline must prioritize comprehensive social support systems**, including childcare, healthcare, and compensation for women's reproductive labour.

### Potential Solutions for Equity

- **Weighted Representation**
  - **One potential solution is to introduce weighted representation**, where factors such as literacy rates, healthcare outcomes, and economic contributions are considered alongside population size.
  - **This would ensure that states are rewarded for their developmental achievements** rather than penalised for lower population growth.
- **Revisiting Delimitation Criteria**



- **The delimitation exercise could be restructured to include demographic and socio-economic indicators as additional criteria for seat allocation.**
- **For instance, states that have achieved population stabilization could receive a baseline level of representation,** preventing significant reductions in their parliamentary seats.
- **Inter-Regional Redistribution**
  - **To address the immediate demographic divide, policies could promote greater inter-regional migration.**
  - **Encouraging labour mobility between northern and southern states could help balance population densities** and foster economic integration, thereby reducing the regional divide over time.
- **Fiscal Incentives for Development**
  - **Beyond representation, fiscal policies could incentivize lagging states to invest in family planning, education, and healthcare.**
  - **By addressing the root causes of high population growth, these policies would help reduce the demographic divide in the long term.**

#### **Way Forward: Balancing Unity and Diversity and Evolution of the Role of Federalism**

- **Balancing Unity**
  - **The issue of regional disparities in political representation is not merely a technical challenge** but a test of India's commitment to federal unity and equity.
  - **Southern states have legitimate concerns about being underrepresented despite their developmental contributions,** while northern states argue that their larger populations warrant greater representation.
  - **Striking a balance between these perspectives requires innovative and inclusive policymaking.**
- **Evolution of the Role of Federalism**
  - **India's federal system must evolve to accommodate its demographic realities** while preserving the principles of unity and equity.
  - **Recognising regional disparities and addressing them proactively will strengthen trust among states and ensure that all regions feel equally valued** in the national decision-making process.
  - **By doing so, India can uphold the spirit of cooperative federalism and create a more balanced and inclusive framework for governance.**

#### **Conclusion**

- **The debate over fertility and representation reflects broader challenges** in managing India's demographic transition.
- **Balancing political representation with demographic realities requires innovative solutions** that prioritise equity, sustainability, and gender justice.
- **Ultimately, the focus must shift from reversing fertility trends to creating a fair and inclusive framework for governance that respects the diversity and achievements of India's states.**



## General Studies III

### 1. Mahakumbh Stampede: Understanding the Causes and Strategies for Prevention

#### Why in news?

A stampede at the **Mahakumbh Mela in Allahabad on January 29** claimed several lives. UP CM attributed the tragedy to the overwhelming crowd gathering for Mauni Amavasya.

The **National Disaster Management Authority (NDMA)** had in 2014 published a report on crowd management at big events and prevention of stampedes. The report said, "Majority of the crowd disasters in India and developing countries have occurred at religious places."

#### Causes of Stampedes

- Stampedes can result from multiple factors, including **structural weaknesses (poor barricading, weak guardrails, narrow exits, inadequate lighting), fire or electrical failures, poor crowd control, and lack of coordination among stakeholders.**
- **Failures in Crowd Control**
  - The NDMA report highlights key reasons for crowd control failures, such as:
    - **Underestimation of expected crowd size**
    - **Exceeding venue capacity**
    - Limited holding areas before entry
    - **Locked or closed exits**
    - **Weak railings and lack of queue management**
    - **Absence of sectoral partitions to regulate movement**
- **Consequences of Poor Management**
  - Inadequate arrangements often trigger **panic or excitement, leading to overcrowding or rapid movement.**
  - This, in turn, results in **crushing, suffocation, and trampling.**
  - The report identifies compressive asphyxia as the leading cause of fatalities in such disasters.

#### Role of Crowd Behaviour in Stampedes

- Understanding crowd behaviour is crucial for preventing stampedes.
- The actions of a few individuals can influence many, sometimes leading to panic or disorder.
- **A community-based approach to crowd control is more effective than force-based methods.**
- **Impact of Overcrowding**
  - At many events, demand exceeds available space, leading to overcrowding.
  - To manage this, **input control**—such as **restricting entry through a mandatory registration process**—can help regulate the crowd.
- **Risks of Poor Crowd Management**
  - Long wait times may prompt individuals to climb fences, causing others to follow and leading to congestion in another area.
  - Additionally, poorly executed control measures, such as **police chasing unruly groups toward an incoming crowd, can create dangerous collisions, worsening the situation.**

#### Past Stampede Incidents

- **The NDMA report references several past stampedes, including:**
  - **Nashik Kumbh (August 2003):** 29 pilgrims died due to overcrowding at barricades, sudden reverse crowd flow, sadhus moving in procession with pilgrims, and unforeseen influx of pilgrims at various points.
  - **Kalubai Yatra Mandhardevi (January 2005):** 293 people were killed due to wrong crowd estimates, inadequate temple space, narrow, slippery paths with illegal vendors, lack of safety measures, and poor infrastructure.

- **Causes Identified in Investigations**

- **Nashik Kumbh:** The stampede was triggered by crowd pressure at barricades and the unplanned movement of pilgrims and sadhus.
- **Kalubai Yatra:** Causes included **inaccurate crowd estimates, narrow paths, illegal activities, lack of safety and medical facilities**, and poor coordination between stakeholders.

- **Proactive Planning for Crowd Control**

- The NDMA report stresses that most stampedes can be avoided with proactive planning and effective execution.

- **It outlines a holistic approach that includes:**

- Controlling the crowd inflow
- Regulating the crowd within the venue
- Managing the crowd outflow

- **Understanding Demand and Supply**

- **To manage demand, authorities must analyze:**

- Historical crowd data
- **Arrival patterns and peak times (e.g., festivals, holidays)**
- Advance registration and ticketing systems
- **Public transport schedules**
- For supply management, the **venue's capacity must be calculated to avoid overcrowding.**

- **Role of Online Registration**

- Examples from **Vaishnodevi and Sabarimala** show that **online registration** can help manage crowd arrivals and influence patterns.

- **Dealing with Limited Supply Capacity**

- In places where increasing supply is not feasible due to religious beliefs or geography, authorities should focus on making waiting times more comfortable for visitors.

- **Importance of Infrastructure and Information in Crowd Control**

- The report highlights the need for **adequate infrastructure** for crowd management at religious sites.
- It recommends setting up **staging points** for visitors, equipped with necessary facilities like rest areas, food, water, and hygiene. These points should be monitored effectively.
- The report also emphasizes the role of **information management** and the need for effective **dissemination of information** to guide visitors and maintain order.

## 2. National Critical Minerals Mission: A Step Towards Self-Reliance

### Why in the News?

The Union government has approved a mission which aims to reduce import dependence on critical minerals.

### What's in Today's Article?

- National Critical Minerals Mission (Objectives, Features, Significance, Challenges, Way Forward, etc.)

### National Critical Minerals Mission:

- The Indian government has approved the **National Critical Minerals Mission (NCMM)** with a total outlay of ₹34,300 crore over seven years.
- The mission aims to reduce **import dependence on critical minerals**, boost domestic **exploration and processing**, and accelerate India's shift towards **green energy technologies**.
- **Objectives and Key Features of the Mission:**
  - **Enhancing Domestic Exploration:** A significant portion of the mission's funds will be allocated to intensifying mineral exploration across the country and in offshore areas.



- **Reducing Import Dependence:** India heavily relies on imports for critical minerals like **lithium, cobalt, nickel, and rare earth elements, essential for electric vehicles (EVs), battery manufacturing, and renewable energy technologies.** This mission aims to curb that dependence.
- **Developing Processing and Recycling Capabilities:** The mission will encourage **investment in mineral processing parks, recycling technologies, and research on sustainable extraction methods.**
- **Overseas Mineral Acquisitions:** Public sector enterprises and private companies will be encouraged to acquire mineral assets abroad to ensure a steady supply of critical minerals.
- **Regulatory and Financial Support:** The mission will streamline regulatory approvals and offer financial incentives for mineral exploration and development.

#### **Significance of Critical Minerals:**

- Critical minerals such as **copper, lithium, nickel, cobalt, and rare earth elements** are essential raw materials for modern industries. They are widely used in:
  - **Renewable Energy Infrastructure:** Wind turbines, solar panels, and electricity networks.
  - **Electric Vehicles (EVs):** Batteries and charging infrastructure.
  - **Electronics & High-Tech Industries:** Smartphones, defense equipment, and medical devices.
- As the world transitions to clean energy, demand for these minerals is soaring, making their **domestic availability crucial** for India's long-term economic and technological security.

#### **Government Strategy and Implementation:**

- The Union Cabinet, chaired by PM Modi, has approved a government expenditure of ₹16,300 crore, while an additional ₹18,000 crore is expected to be invested by **public sector undertakings (PSUs)** and private companies.
- **Key Implementation Measures:**
  - **Expedited Mining Approvals:** The mission will establish a **fast-track regulatory process** for mineral mining projects.
  - **Stockpile Development:** A strategic stockpile of critical minerals will be built to safeguard India's supply chains.
  - **Policy Reforms:** In 2023, the **Mines and Minerals (Development and Regulation) Act, 1957** was amended, enabling the auction of **24 strategic mineral blocks.**
  - **Geological Survey of India (GSI) Exploration Projects:** Over the past three years, the **GSI has initiated 368 mineral exploration projects, with 227 projects planned for 2025-26.**
  - **Import Duty Waivers:** The government has removed **customs duties** on several critical minerals in the **FY25 budget** to encourage domestic processing and manufacturing.

#### **Impact on India's Energy Transition:**

- **The NCMM is expected to:**
  - **Secure mineral supply chains** for India's clean energy sector.
  - **Boost domestic manufacturing** of EV batteries and renewable energy components.
  - **Strengthen India's position** in the global critical minerals market.
  - **Attract foreign and private investment** in mining and mineral processing.

#### **Challenges & Way Forward:**

- While the mission is a significant step forward, certain challenges remain:
  - **Geopolitical Risks:** Acquiring mineral assets overseas can be influenced by global political dynamics.
  - **Environmental Concerns:** Increased mining activities must balance ecological conservation.
  - **Investment Risks:** Private sector participation needs strong policy support.
- To address these challenges, the government plans to collaborate with **research institutions, industries, and international partners** to ensure a sustainable and efficient implementation of the mission.

#### **Conclusion:**



- The **National Critical Minerals Mission** is a landmark initiative aimed at reducing **import dependence**, strengthening **domestic mining capabilities**, and securing India's **clean energy future**.
- By integrating **exploration, processing, recycling, and international collaboration**, India is taking a strategic step towards self-reliance and global leadership in critical mineral supply chains.

### 3. DeepSeek: The AI Disruptor Reshaping the Industry

#### Why in news?

**Chinese startup DeepSeek has launched AI models that compete with top U.S. models at a much lower cost.**

In December 2024, the company revealed that training its DeepSeek-V3 model cost less than \$6 million using Nvidia H800 chips. DeepSeek's AI Assistant is now the top-rated free app on Apple's U.S. App Store, beating ChatGPT. This has raised questions about why U.S. tech companies are spending billions on AI. It has also affected the stock prices of big companies like Nvidia.

#### DeepSeek: A New Chatbot Rival to ChatGPT

- DeepSeek is a **free AI-powered chatbot that functions similarly to ChatGPT**. It can perform various tasks, though its effectiveness compared to rivals remains debated.
- **Performance and Efficiency**
  - DeepSeek's R1 model is **reportedly as powerful as OpenAI's o1**, excelling in mathematics and coding.
  - It is a "reasoning" model that processes responses incrementally, using less memory and reducing operational costs.
- **Censorship and Limitations**
  - Like other **Chinese AI models**, DeepSeek **avoids politically sensitive topics**.
  - When asked about the Tiananmen Square massacre, it refused to provide details, highlighting Chinese government-imposed censorship.
- **Cost-Effective AI Development**
  - DeepSeek **claims to have trained its model for just \$6 million**, significantly lower than the over \$100 million OpenAI spent on GPT-4.
  - The company's founder reportedly stockpiled Nvidia A100 chips—banned from export to China since 2022—pairing them with cheaper chips to develop the AI.
- **Security Challenges and Outages**
  - After becoming the most-downloaded free app on **Apple's U.S. App Store**, DeepSeek **faced large-scale cyberattacks, forcing temporary registration limits**.
  - The company also experienced website outages.

<b>IT TOOK ONLY \$5.6MN TO CREATE</b>	
<ul style="list-style-type: none"> <li>&gt; Founded in May 2023 by Liang Wenfeng, who also founded and runs a hedge fund called High-Flyer</li> <li>&gt; DeepSeek's headquarters is in the Chinese city of Hangzhou</li> <li>&gt; Paid access to its new model reportedly comes at 3% of what OpenAI charges</li> </ul>	<ul style="list-style-type: none"> <li>&gt; The AI model sidetracks questions on itself and Chinese politics</li> <li>&gt; DeepSeek's first AI model — launched in Nov 2023 — was called DeepSeek Coder</li> <li>&gt; DeepSeek became #1 downloaded free app on Apple App Store, displacing ChatGPT which, though, has higher total downloads</li> </ul>

#### DeepSeek: causing a stir

- **DeepSeek Challenges U.S. AI Dominance**
  - The launch of OpenAI's ChatGPT in 2022 spurred Chinese tech firms to develop their own AI chatbots.
  - However, early models, such as **Baidu's**, **failed to meet expectations, highlighting a gap between Chinese and U.S. AI capabilities**.
  - DeepSeek has reversed this perception with high-quality and cost-efficient models.



- **DeepSeek's Cost-Effective Advantage**

- DeepSeek's AI models, DeepSeek-V3 and DeepSeek-R1, have received praise from Silicon Valley executives and engineers.
- The company claims its models match OpenAI and Meta's best AI systems while being significantly cheaper to use.

**The AI Race: A Strategic Moment for India**

- PM Modi's upcoming participation in the AI summit in Paris highlights India's need to carefully assess the implications of the escalating AI competition between the US and China, especially following the release of DeepSeek R1.
- **The DeepSeek-Sputnik Parallel**
  - DeepSeek R1's release is being compared to the Soviet Union's launch of Sputnik in 1957, which shocked the US and spurred an intense space race.
  - Similarly, DeepSeek has intensified the technological rivalry between the US and China, setting a new frontier for great power competition.
- **US-China AI Rivalry: A Bipolar Landscape**
  - China, with its large GDP and investments in frontier technologies, is a **formidable AI competitor to the US**.
  - The competition is expected to **remain bipolar, leaving other nations, including India, struggling to keep pace**. However, how this rivalry unfolds remains uncertain.
- **Doing More with Less: Lessons for Middle Powers**
  - DeepSeek has demonstrated the **potential to achieve innovation with limited resources**.
  - This provides hope for middle powers like **India and France, which cannot match US-China spending but can still remain relevant in the AI domain by focusing on strategic innovation and cooperation**.
- **Sovereign AI and Partnerships**
  - India and France advocate for "**Sovereign AI**," focusing on balancing cooperation with the US and independent AI development.
  - A partnership model between the US and its allies, including India, could help compete with China.
  - However, **India must address US concerns about technology leakage to Russia to strengthen this partnership**.
- **Cooperation Amid Rivalry**
  - Historical examples like **US-Soviet cooperation in outer space during the Cold War suggest that the US and China could eventually collaborate on global AI governance**.
  - Such cooperation may focus on preventing AI misuse and controlling its destabilizing effects, much like nuclear deterrence regimes.
- **India's Strategic Role in Global AI Governance**
  - India must avoid past mistakes, such as being sidelined in the global nuclear governance framework, by clearly defining its AI strategy.
  - **Delhi has the opportunity to shape global AI governance rather than remain a passive participant**.
- **Conclusion**
  - The AI race presents both challenges and opportunities for India. By leveraging partnerships, investing in innovation, and ensuring strategic clarity, India can play a pivotal role in the evolving AI landscape.

#### 4. The Eighth Wonder of Economic Growth- Understanding the Nuances of Sustainability

**Context:**

**Albert Einstein's analogy of compound interest as the "eighth wonder of the world" applies aptly to economic growth.**





India's long-term growth potential is immense, with a projected GDP per capita increase from \$2,650 to \$10,000 by 2045 at a 6% real growth rate.

Even a slightly lower growth rate of 5.5% can achieve the same target, albeit by 2047. The key lies in sustainable, low-risk growth over extended periods.

#### **Key Challenges to India's Economic Growth:**

- **Debt-fueled growth and rising household indebtedness:**
  - **Changing borrowing patterns:** Unlike earlier generations, modern households borrow not just for emergencies or appreciating assets but increasingly for depreciating assets and experiences.
  - **Click-driven EMIs:** The proliferation of e-commerce and the ease of borrowing through digital platforms have **encouraged debt-led consumption**. While this boosts short-term growth, it shifts the burden to the future.
  - **Impact on consumption and growth:** Rising household debt and increasing retail non-performing assets (NPAs) necessitate measures to slow personal loan growth, ensuring more sustainable consumption patterns.
  - **Need for conscious choices:** Encouraging cash-down purchases through better pricing over EMIs can promote financial discipline, akin to the lessons of the marshmallow test, which emphasizes delayed gratification.
- **Competitive pressure from China:**
  - **China's manufacturing dominance:**
    - Despite the **China+1 strategy**, India faces stiff competition due to **China's strong manufacturing base, policy support, and surplus capacity**.
    - Weak domestic demand in China has led to export price deflation, complicating matters for Indian exporters.
  - **India's gradual progress:** While India has the potential to increase its manufacturing share, achieving competitiveness requires sustained effort and investment.
- **Global and domestic economic headwinds:**
  - **Rising US interest rates:** Higher US rates and a strong dollar have reduced the yield gap between India and the US, impacting foreign investments.
  - **Decline in net FDI:** Sales of stakes by multinational corporations in Indian arms, driven by valuations rather than pessimism, have contributed to the fall in foreign direct investment.
  - **Stock market overvaluation:**
    - The **enthusiasm for small and mid-cap stocks, fueled by post-Covid recoveries and new retail investors, may lead to overvaluation risks**.
    - Investors should heed the principle of "reversion to the mean" for long-term stability.

#### **Strategies for Sustainable Growth:**

- **Disciplined borrowing practices:** Regulating personal loans and promoting conscious financial decisions can build a more resilient economy.
- **Boosting manufacturing competitiveness:** Long-term policies, investments in infrastructure, and skill development are essential for India to compete with China's manufacturing prowess.
- **Cautious investment approach:** Educating new retail investors about market cycles and avoiding speculative tendencies in IPOs and mid-cap investments will foster stability.
- **Policy and structural support:** The government's proactive role in supporting manufacturing, tackling inflation, and encouraging foreign investments will be critical.

#### **Conclusion - The Path to \$10,000 Per Capita GDP:**

- India's journey to achieving a GDP per capita of \$10,000 is plausible with sustainable growth strategies.
- However, this requires addressing challenges like **debt-fueled consumption, global competition, and market exuberance**.
- By fostering **financial discipline, bolstering manufacturing**, and adopting a cautious investment approach, India can ensure long-term economic resilience and prosperity.



## 5. India's Fiscal Health Index: Assessing State Finances

### Why in the News?

The Chairman of the 16th Finance Commission, **Dr. Arvind Panagariya**, launched the inaugural issue of NITI Aayog's report titled "**Fiscal Health Index (FHI) 2025**".

### Understanding the Fiscal Health Index:

- The Fiscal Health Index (FHI), introduced by **NITI Aayog**, provides a systematic framework to evaluate the fiscal performance of **18 major Indian states**.
- This initiative highlights critical aspects of state finances, emphasizing the importance of transparency, revenue mobilization, and sustainable public financial management.
- **The FHI assesses states using five sub-indices:**
  - **Quality of Expenditure,**
  - **Revenue Mobilization,**
  - **Fiscal Prudence,**
  - **Debt Index, and**
  - **Debt Sustainability**
- These metrics offer a comprehensive view of fiscal health, aiding policymakers in identifying areas for improvement and fostering best practices across states.

### Key Highlights from the FHI Report 2025 (2022-23 FY):

- **Top Performers:**
  - **Odisha: Ranked first with an FHI score of 67.8**, Odisha excelled in Debt Index and Debt Sustainability due to its low fiscal deficit, strong debt management, and effective capital expenditure strategies.
  - **Chhattisgarh:** Achieved the **second rank with strengths in Debt Index** and revenue growth from mining activities.
  - **Goa:** Positioned third, excelling in Revenue Mobilization due to high tax efficiency and non-tax revenue generation.
- **Aspirational States:**
  - States like **Punjab, Kerala, and West Bengal** faced challenges in debt sustainability and revenue mobilization, highlighting the need for fiscal reforms.

### Sub-Index Insights:

- **Quality of Expenditure:**
  - States like **Madhya Pradesh and Chhattisgarh** prioritized **social and economic services**, allocating substantial portions of their expenditure to health and education.
  - However, states such as **Punjab and Rajasthan** lagged in **capital expenditure, impacting long-term developmental goals**.
- **Revenue Mobilization:**
  - **Odisha, Goa, and Chhattisgarh** led in **revenue mobilization**, leveraging non-tax revenues from mining and industrial activities.
  - States like Bihar and West Bengal struggled with low own-tax revenues, relying heavily on central transfers.
- **Fiscal Prudence:**
  - **Odisha and Jharkhand** maintained **fiscal prudence with lower fiscal deficits**, enabling better allocation of resources toward development.
  - States with persistent revenue deficits, such as Kerala and Andhra Pradesh, faced constraints in managing fiscal stability.
- **Debt Index:**



- Maharashtra and Gujarat demonstrated robust debt management practices, maintaining low debt-to-GSDP ratios.
- Conversely, **Punjab and Haryana grappled with rising debt burdens and high interest payments.**
- **Debt Sustainability:**
  - Odisha and Chhattisgarh showcased sustainable debt management by ensuring economic growth outpaced interest payment growth.
  - In contrast, states like West **Bengal and Punjab exhibited growing fiscal stress due to persistent deficits.**

#### **Challenges and Recommendations:**

- **Revenue Diversification:** States need to enhance their revenue base by tapping into non-tax sources and improving tax compliance.
- **Capital Expenditure Focus:** Prioritizing investments in infrastructure, health, and education is crucial for long-term growth.
- **Debt Management:** Adopting a comprehensive debt sustainability framework is essential for reducing fiscal stress.
- **Transparency:** Enhanced reporting mechanisms and adherence to fiscal responsibility norms will bolster accountability and public trust.

#### **Conclusion:**

- The Fiscal Health Index serves as a vital tool for **benchmarking state performance and identifying areas for fiscal improvement.**
- While states like **Odisha and Chhattisgarh exemplify strong fiscal discipline, others must adopt targeted strategies to overcome challenges.**
- By fostering fiscal prudence, enhancing revenue mobilization, and ensuring debt sustainability, states can contribute to India's economic resilience and inclusive growth.
- Under NITI Aayog's guidance, the **FHI sets the stage for transformative fiscal reforms, ensuring a balanced and sustainable future for the nation.**

## **6. How India Can Become the World's Leading Startup Ecosystem**

#### **Context**

- **India's startup ecosystem has experienced a meteoric rise**, evolving from a nascent stage to becoming the **world's third-largest hub for innovation** and entrepreneurship.
- With over **1,30,000 recognised startups today, up from a mere 400 in 2015-16**, this remarkable growth underscores the country's vibrant entrepreneurial spirit.
- **Central to this transformation** is India's robust **digital public infrastructure, addressing global challenges such as financial inclusion, sustainable development, and agricultural productivity.**

#### **An Assessment of Technological Opportunities and Government Initiatives**

- **Strategic Government Missions**
  - The **government has been proactive in creating this growth** through several strategic initiatives.
  - The **National Quantum Mission** aims to position India as a global leader in quantum computing by driving advancements in quantum communication, encryption, and computation.
  - This **initiative will enable breakthroughs in sectors like healthcare, cybersecurity, and finance.**
  - **Similarly, the India AI Mission focuses on leveraging artificial intelligence to solve real-world problems**, such as improving healthcare accessibility, optimizing supply chains, and enhancing urban planning.
  - The **Semiconductor Mission, aimed at boosting domestic semiconductor manufacturing, addresses the critical need for self-reliance** in this vital technology sector, especially in light of global supply chain vulnerabilities.



- **Commitment to Research and Development**

- The government has allocated a substantial ₹1 lakh crore for research and development (R&D), reflecting its commitment to fostering innovation.
- This funding not only supports academic research but also enables startups to explore pioneering technologies, bridging the gap between conceptual research and market-ready solutions.

- **Progressive Policies**

- The liberalisation of space exploration and geospatial technology has encouraged private players to contribute to satellite launches, remote sensing, and space research.
- This has allowed startups like Skyroot Aerospace and Pixxel to emerge as key contributors to India's space ambitions.
- Similarly, the government's focus on drones, electric vehicles, and clean energy aligns with global trends toward sustainability and energy efficiency.

### Key Features of Indian Start-Up Ecosystem

- **Innovation, Intellectual Property**

- India produces approximately 24,000 PhD graduates annually, driving advancements in science and engineering.
- However, the country paid \$14.3 billion in intellectual property (IP) royalties in 2024 while earning only \$1.5 billion, highlighting a significant innovation gap.
- Strengthening the intellectual property ecosystem is crucial for fostering innovation and establishing India as a global hub.
- Startups must lead this effort by contributing to advancements in technology and intellectual property.

- **Expansion to Smaller Cities**

- The growth of India's startup ecosystem is no longer confined to metro cities like Bengaluru, Mumbai, and Delhi.
- Nearly 50% of startups now emerge from Tier II and Tier III cities, including Indore, Jaipur, and Ahmedabad. With half of India's urban population living in smaller cities, these regions hold immense potential.
- Supporting these hubs with infrastructure, educational opportunities, and inclusivity — particularly by increasing women's representation in leadership roles — can unlock untapped talent and drive innovation.

### An Analysis of Funding Challenges for Start-Ups

- **Access to Patient Capital in Deep Tech**

- While Indian startups have achieved remarkable growth, those operating in deep tech sectors face a significant hurdle: access to patient capital.
- Deep tech startups, which focus on highly technical and research-intensive fields like quantum computing, AI, robotics, and biotech, require long-term investments due to the prolonged development cycles of their products and solutions.
- Traditional venture capitalists and private equity investors often hesitate to fund these ventures, as the returns are not immediate.
- The Fund of Funds for Startups (FFS), launched in 2016, has been instrumental in addressing this issue to some extent.
- By committing ₹11,688 crore across 151 Alternative Investment Funds (AIFs), the FFS has catalysed a pool of ₹81,000 crore, demonstrating a multiplier effect in the funding ecosystem.

- **Over-Reliance on Foreign Capital**

- One of the key challenges facing India's startup ecosystem is its heavy reliance on foreign funding.
- In 2024, Indian startups raised over \$12 billion, but approximately 75% of this came from international sources.



- While foreign capital has played a pivotal role in driving the growth of the ecosystem, **over-reliance on it poses risks, including vulnerability to global economic fluctuations and potential misalignment of long-term strategic goals.**

#### **The Way Forward to Address these Challenges**

- **Incorporation of Ethical Practices and Self Regulations**
  - **India's startup ecosystem thrives on minimal regulatory interference, creating innovation and flexibility.**
  - However, **recent incidents of corporate mismanagement in prominent startups like Byju's and BharatPe have raised concerns.**
  - To address these issues, **startups must adopt self-regulation frameworks emphasizing accountability, transparency, and ethical conduct.**
  - **Mentorship, professional boards, and sound financial management are essential** for long-term stability.
  - **Investors, particularly venture capitalists and angel investors, also play a crucial role** in ensuring governance and guiding startups toward sustainable growth.
- **Leveraging Domestic Institutional Capital**
  - To address this over-reliance, **India must bolster its domestic funding ecosystem.**
  - **Large domestic institutions** such as insurance companies, pension funds, and **mutual funds hold significant untapped potential.**
  - **By allocating a portion of their surpluses to startups, these institutions can provide the long-term capital** needed to support innovation and growth.
  - This **approach also aligns with the broader national interest**, ensuring that the wealth generated from India's burgeoning startup ecosystem benefits domestic stakeholders.
- **Creating a Resilient Domestic Funding Ecosystem**
  - To ensure the sustainability of India's startup ecosystem, **a resilient and diversified funding environment is essential.**
  - **Increasing domestic capital participation**, establishing specialized funds for high-risk ventures, and developing a culture of long-term investment will create a robust financial backbone for startups.
  - **This will enable India to maintain its trajectory as a global innovation leader**, driving economic growth and technological advancement.
- **Need for a Dedicated Fund for Deep Tech**
  - Despite the FFS's success, **there is a critical need for a specialized fund of funds exclusively for deep tech startups.**
  - These **startups operate in domains that are high-risk yet high-reward**, often requiring extended periods of development before achieving profitability.
  - **A dedicated fund would provide the patient capital necessary for these ventures to innovate without the immediate pressure** of financial returns.

#### **Conclusion**

- **India is well-positioned** to become the **world's leading startup ecosystem.**
- **Favourable policies, a thriving culture of innovation**, and collaborative efforts across sectors **provide the foundation** for scaling startups into global enterprises.
- As India works towards its vision of Viksit Bharat by 2047, **startups will play a pivotal role in driving economic growth, creating jobs, and positioning the country as a leader in innovation.**

## **7. India Meteorological Department's (IMD) 150th Anniversary**

### **Why in News?**

Prime Minister Narendra Modi highlighted India's advancements in meteorology, underscoring their **critical role in disaster management, economic resilience, and global collaboration.**

The event commemorating the 150th anniversary of the India Meteorological Department (IMD), **established in 1875**, also showcased ambitious plans for its future.

#### Origin and Significance of the IMD:

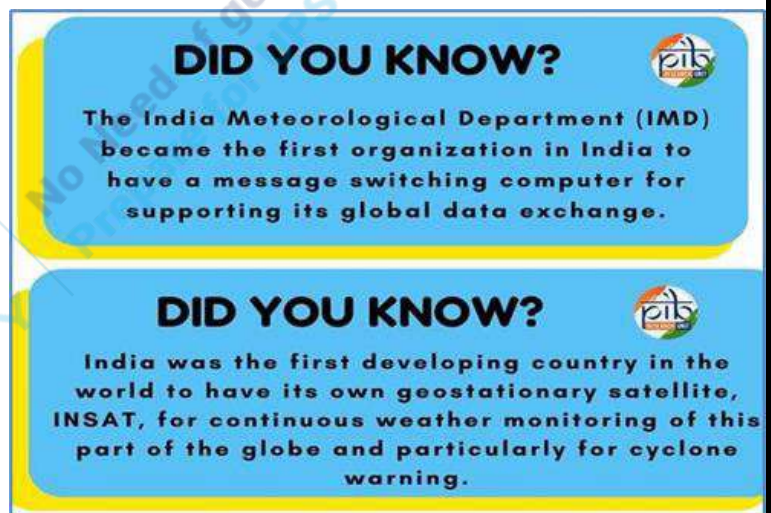
- **The IMD was established in 1875**, following a series of catastrophic events (including a devastating tropical cyclone that struck Calcutta in 1864) that underscored the need for **centralized meteorological services.**
- It comes under the **Ministry of Earth Sciences**, Government of India.
- Since its inception, the department has played a crucial role in **advancing meteorology** as a modern physical science.

#### Key Highlights of the 150th Anniversary Celebration of the IMD:

- **Commemorative releases:** Vision Document 2047, outlining the roadmap for IMD's progress.
- **Achievements acknowledged:** PM Modi lauded IMD's accurate forecasting, citing the timely prediction during the Z-Morh tunnel inauguration in Sonmarg, Kashmir.

#### Achievements and Acknowledgements of the IMD:

- **Make in India initiative**
  - IMD has been the front runner of the development of Indigenous technology, commencing with **indigenous RADAR in 1958, and Indian Satellite products** in collaboration with ISRO since 1983.
  - **Other initiatives:**
    - Automatic Weather Station since 2000,
    - Doppler Weather Radar since 2010,
    - Common Alerting Protocol since 2019,
    - Impact based Forecast since 2019,
    - Dynamic composite risk atlas since 2022, etc.
- **Technological and strategic advancements:**
  - **Mission Mausam:** Launched to revolutionize weather surveillance through:
    - High-resolution atmospheric observations.
    - Next-generation radars and satellites.
    - High-performance computing systems.
- **IMD's role in global and regional meteorology:**
  - Secretary General of the World Meteorological Organization (WMO), **acknowledged India's six-decade representation at the WMO**, the longest in the Asia-Pacific.
  - **WMO also highlighted India's critical role in supporting neighboring countries**, including Nepal, Bhutan, Bangladesh, and Sri Lanka, with weather forecasts.
  - **For example**, India's Flash Flood Guidance system provides vital data to neighboring nations.
- **Improved forecasting accuracy:** IMD's forecast accuracy has improved by 50%, enabling better disaster preparedness.
- **Ministerial endorsements:** Jitendra Singh, Minister of State for Earth Sciences, emphasized IMD's vital role in reducing human casualties and economic losses.



#### Vision for the Future of the IMD:

- **Forecast accuracy goals:**



- IMD aims to improve forecast accuracy by 10-15% in the next five years.
- **Vision for 2047 includes:**
  - Zero-error forecast accuracy for three-day predictions.
  - 90% accuracy for five-day forecasts.
  - Tailor-made forecasts for individual users.
- **Future focus areas:**
  - **Developing earthquake warning systems.**
  - Expanding the observational network on land, at sea, and in space.
  - Enhancing the capacity to detect localized severe weather events.

#### **Conclusion:**

- PM Modi reiterated the importance of meteorological advancements in safeguarding lives and supporting global collaboration.
- With ambitious goals under Vision Document 2047 and the launch of Mission Mausam, IMD is poised to transition from weather forecasting to comprehensive weather management, striving to make India a "**weather-ready nation**" by 2047.

## **8. Ensuring Rights of Forest-Dwelling Communities: Ministry of Tribal Affairs Intervenes**

#### **Why in the News?**

The **Ministry of Tribal Affairs (MoTA)** has underscored the importance of protecting forest-dwelling communities from unlawful eviction, as mandated by the **Forest Rights Act (FRA)**.

In a recent directive to states, the Ministry emphasized the need for institutional mechanisms to ensure compliance with the law and establish a grievance redressal framework.

#### **About Forest Rights Act (FRA), 2006:**

- The **Forest Rights Act, 2006** (officially known as the **Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act**) is a landmark legislation aimed at recognizing and securing the rights of forest-dwelling communities in India.
- **Key Objectives:**
  - **Recognition of Rights:** To recognize the historical rights of forest-dwelling Scheduled Tribes (STs) and Other Traditional Forest Dwellers (OTFDs) over forests they depend on for their livelihood.
  - **Protecting Livelihoods:** Ensuring the sustainable use of forest resources by local communities.
  - **Empowering Communities:** Granting legal rights to forest land and resources to these communities.
- **Types of Rights Recognized:**
  - **Individual Rights:** Ownership and access to forest land for cultivation and habitation.
  - **Community Rights:**
    - Use of **minor forest produce (e.g., bamboo, honey, lac)**.
    - **Grazing rights and access to water bodies.**
    - Management and conservation of forests by local communities.
  - **Community Forest Resource Rights:** Rights to protect, regenerate, and manage forests sustainably.
- **Key Features:**
  - **Ownership of Land:** Recognizes land up to 4 hectares per family for cultivation.
  - **Protection Against Eviction:** Prevents eviction of forest dwellers without proper recognition and settlement of rights.
  - **Role of Gram Sabha:** Empowers the **Gram Sabha (village assembly) to determine the rights of individuals and communities.**
  - **Conservation Focus:** Encourages sustainable management of forests while protecting biodiversity.



• **Challenges:**

- **Delayed Implementation:** Slow progress in recognizing rights across states.
- **Proof of Eligibility:** Difficulty in providing documentary evidence by forest-dwelling communities.
- **Conflict with Conservation Laws:** Balancing rights with wildlife and forest conservation initiatives.
- **Opposition from Industries:** Resistance from industries reliant on forest resources.

**Ensuring Rights of Forest:**

- The **Ministry of Tribal Affairs** has underscored the importance of protecting forest-dwelling communities from unlawful eviction, as mandated by the Forest Rights Act.
- The Ministry's action comes in response to multiple complaints from villages located within tiger reserves in states such as **Madhya Pradesh (MP), Maharashtra, and West Bengal.**
- Residents alleged that they were being pressured to vacate their traditional lands without proper recognition of their rights under the **FRA** and the **Wildlife Protection Act.**
  - **Madhya Pradesh:** In December, **52 Gram Sabhas** from the **Durgavati Tiger Reserve** submitted representations, prompting the Ministry to request the state tribal development department to address these issues.
  - **Maharashtra:** In October, similar complaints were raised by Rantalodhi village residents in the **Tadoba Tiger Reserve.**
- These grievances have highlighted the need for greater accountability and adherence to legal provisions in relocation efforts.

**Ministry's Directives to States:**

- To address these concerns, the **Ministry has instructed state tribal development and forest departments to submit detailed reports on:**
  - **Villages in Tiger Reserves:** Names and numbers of villages located within tiger reserves.
  - **Demographic Information:** Tribes and forest-dwelling communities residing in these villages.
  - **Forest Rights Claims:** Data on claims received, vested, and rejected under the FRA.
  - **Consent and Compensation:** Processes for obtaining free and informed consent of gram sabhas and the compensation plans for relocation.
- The Ministry reiterated that **Section 4(2) of the FRA** explicitly safeguards forest-dwelling communities by legally recognizing their rights, prohibiting unlawful eviction, and ensuring that resettlements are voluntary and conducted with informed consent.

## 9. Decoding India's Growth Slowdown: Key Insights and Recommendations

**Current Growth Scenario:**

- **Decline in Growth Rate:**
  - The National Statistics Office (NSO) has estimated India's real GDP growth rate at **6.4% for 2024-25**, down from **8.2% in 2023-24.**
  - This figure is below the **6.5-7% projection** made in the Economic Survey 2023-24 and lower than the **10.5% nominal GDP growth estimate** in the Union Budget.
- **Data Discrepancies:**
  - Economists and institutions like the **IMF** have raised concerns over the use of the **Wholesale Price Index (WPI)** as a deflator in GDP estimates.
  - Significant divergence between **WPI and Consumer Price Index (CPI)** rates has led to inconsistencies in nominal and real GDP calculations.

**Challenges in Private Investment:**

- **Sluggish Corporate Investments:**





- Despite corporate tax cuts in 2019, private investments in key sectors like machinery and intellectual property remain weak.
- The **majority of private investments are skewed towards "dwellings, other buildings, and structures," reflecting an unhealthy mix.**
- **Comparison with the growth during 2004-2014:**
  - During 2004-2014, **real private investment grew at 10% annually**, outpacing public investment (9%).
  - During 2014-present, private investment growth slowed to **6.3%**, slightly below public investment growth (6.6%).
- **Post-Pandemic Recovery:**
  - While private investment rebounded in 2021-22 due to a base effect, sustained structural changes in private sector behaviour have been elusive.

#### Sectoral Analysis:

- **Divergent Performance:**
  - **Manufacturing:** Showed double-digit growth in early 2023-24 but has since slowed down.
  - **Mining, Power, and Construction:** Experiencing significant slowdowns.
  - **Services:** Sectors like retail trade, transport, finance, and real estate show deceleration.
  - **Public Administration and Defence:** The only sector projected to grow faster in 2024-25, underscoring the role of public spending.

#### Fiscal Strains:

- **Revenue Shortfalls:**
  - As of November 2024, only **56% of net tax revenue targets** for 2024-25 have been achieved, while **non-tax revenues** reached 78% due to a surplus transfer from the RBI.
- **Impact on Expenditure:**
  - By November 2024, less than half of the **₹11.11 trillion capex target** had been spent, disrupting public investment plans.
- **Fiscal Consolidation Dilemma:**
  - Adhering to fiscal discipline may reduce **public spending, further aggravating the slowdown.**
  - However, abandoning fiscal consolidation risks worsening public debt and interest burdens.

#### Policy Recommendations:

- **Revenue Mobilization:**
  - Rework taxation policies to increase taxes on **wealth and profits**, enabling higher public spending on infrastructure and welfare programs.
- **Encourage Private Investment:**
  - Strengthen incentives for private sector investments in productive assets, particularly in manufacturing and intellectual property.
- **Enhance Public Spending:**
  - Focus on capital expenditure in sectors like infrastructure and renewable energy to stimulate economic growth.
- **Data and Statistical Reforms:**
  - Replace the WPI-based deflator with the **Producer Price Index (PPI)** for more accurate GDP estimates.
  - Ensure regular updates to GDP methodologies to reflect real-time economic changes.

#### Long-Term Considerations:

- **Structural Reforms:**
  - Introduce policies to **improve ease of doing business and reduce bureaucratic delays in project approvals.**
  - Enhance credit access for small and medium enterprises (SMEs) to stimulate broad-based economic growth.
- **Global Integration:**

- Boost exports through trade agreements and incentivize manufacturing under programs like **PLI (Production Linked Incentive)**.
- **Focus on Consumption:**
  - Strengthen rural demand through direct income support and employment generation schemes like MGNREGA.

#### Conclusion:

- India's economic growth faces challenges from **inconsistent private investments, sectoral slowdowns, and fiscal pressures**.
- To overcome these hurdles, a **balanced approach combining enhanced revenue mobilization, targeted public spending, and robust private sector incentives is essential**.
- Addressing statistical discrepancies and adopting long-term structural reforms can pave the way for sustainable economic growth.

## 10. The Right to Food and the Struggle with the PDS

### Context

- **The right to food**, a cornerstone of human dignity and survival, **has been enshrined as a fundamental right in India for over two decades**.
- However, **recent reports from Jharkhand, Odisha, and Bihar reveal a troubling reality**: the Public Distribution System (PDS), designed to ensure food security, has not been able to protect the most vulnerable.
- **Bureaucratic inefficiencies, systemic corruption, and social inequities have created barriers** that deprive marginalized communities of their basic entitlement to sustenance.

### A Detailed Examination of the Exclusion Crisis:

- **Scale of Exclusion**
  - **In states like Jharkhand and Odisha, substantial numbers of households have been removed from the PDS rolls**, often without clear justification or due process.
  - This **phenomenon extends to Bihar, where the plight of the Musahar community exemplifies the devastating impact** of such exclusion.
  - The **Musahars, among the most marginalized castes in India, have historically been relegated** to the fringes of society.
- **The Impact of Biometric Verification**
  - The **introduction of biometric verification** at fair price shops (FPS) was **intended to enhance efficiency and reduce fraud in the PDS**.
  - However, in practice, it **has become a tool of exclusion**. **Many beneficiaries, particularly in rural and marginalised communities, have lost access to rations because their biometric details could not be authenticated**.
  - This is often **due to technical errors**, lack of proper infrastructure, or discrepancies in their Aadhaar details.
  - **When names are struck off the PDS rolls as a result, individuals must reapply for a new ration card**, a process fraught with bureaucratic hurdles.
- **Disconnected Governance**
  - The **exclusion crisis is emblematic of a broader disconnect** between policymaking and the realities of marginalized populations.
  - While the government promotes ambitious initiatives such as 'smart cities,' **it has failed to address the basic needs of those most reliant on state welfare**.
  - This **disparity highlights a troubling prioritisation of urban development** and technological advancement over the welfare of rural and underprivileged communities.



### The Example of the Musahar Community

- Bihar was blighted by a supply crisis, when rations were needed the most, at the time of the COVID-19 pandemic.
- Since then, **there are communities which continue to be in want of a stable supply of ration.**
- This is more notable among extremely marginalised communities such as the Musahars.
- **This is a community that has been pushed beyond the edge of destitution** by the socio-politics of caste.
- Its struggle with the PDS emerges as **a significant symptom of the same.**
- **A number of Musahar households in Patna district do not have an active ration card.**
- Even if they do have one, there is another problem, **the card does not have the names of all the family members.**

### Some Other Problematic Issues with PDS

- **Corruption and Mismanagement in PDS**
  - **Beneficiaries entitled to five kilograms** of food grain per person under the Priority Household (PHH) ration card **often receive only four kilograms, and this is typically substandard rice.**
  - **Wheat, a staple for many, is often not issued at all.**
  - Such **practices reveal a pervasive culture of exploitation and mismanagement** that deprives vulnerable families of their rightful entitlements.
- **Legal and Administrative Barriers**
  - The **enrolment process for ration cards exemplifies how bureaucratic red tape hinders access to food.**
  - In Bihar, **applicants must submit Aadhaar details, caste certificates, income certificates, and residence proofs, despite no legal basis for these requirements** under the National Food Security Act (NFSA) of 2013 or the PDS Control Order of 2015.
  - **Officials often cite these demands as oversights in the digitised system,** yet they persist, further alienating the marginalized.
  - **Jharkhand, Uttar Pradesh, and Madhya Pradesh impose similar documentation demands,** reflecting a broader failure to align governance with citizen welfare.
  - **The push for digitisation and e-governance, while laudable in theory, has prioritised technology over accessibility,** leaving those without digital literacy or resources at a severe disadvantage.

### The Consequence of Exclusion: Exploitation of Vulnerability

- The systemic inefficiencies of the PDS have **spawned a market of exploitation, particularly targeting marginalized communities like the Musahars.**
- **Middlemen charge exorbitant fees,** sometimes exceeding ₹3,000, for processing ration card applications.
- Often, **these middlemen disappear after receiving payment,** leaving applicants without documents or recourse.
- **Even when applications are submitted, delays are rampant.** While the 2015 order mandates the issuance of ration cards within 30 days, many applications remain pending for months, even years.
- This **delay denies families access to the basic means of subsistence,** turning food security from a fundamental right into an elusive privilege.

### Necessary Policy Reform to Address these Systematic Issues

- **Simplification of Enrolment Procedures**
  - The complexities of the PDS enrolment process **disproportionately impact marginalised communities.**
  - **Currently, applicants are often required to provide multiple documents,** including caste certificates, income certificates, and residence proofs, **despite no legal basis for these demands under the NFSA or the PDS Control Order of 2015.**
  - **These requirements must be eliminated to simplify the process** and align it with legal frameworks.
  - **Reforms should focus on a single-window system for applications,** where minimal documentation is required, and applicants receive clear guidance on the process.
- **Strengthening Accountability and Reducing Corruption**
  - **Corruption within the PDS erodes trust and deprives beneficiaries** of their rightful entitlements.



- Instances where FPS dealers reduce the quantity or quality of grains distributed must be addressed through stricter oversight and enforcement mechanisms.
- **The government must establish independent monitoring bodies** to audit the distribution process and ensure adherence to norms.
- **Whistleblower protection and grievance redressal mechanisms should be strengthened**, empowering beneficiaries to report malpractices without fear of reprisal.
- **Empowering Communities through Local Governance**
  - Decentralisation of the PDS can enhance its responsiveness and accountability.
  - **Empowering local governance bodies**, such as Panchayats, to oversee distribution and address grievances **can improve system efficiency**.
  - **These bodies can also play a role in identifying eligible beneficiaries**, ensuring that no one is excluded due to bureaucratic oversights.

### Conclusion

- **The right to food**, affirmed in the landmark case People's Union of Civil Liberties vs. Union of India in 2001, **remains a hollow promise for millions**.
- **Bureaucratic inefficiency and indifference** have suffocated this fundamental right, **leaving marginalized communities to bear the brunt of systemic failure**.
- **Addressing these issues is not merely a matter of governance**; it is a moral imperative to uphold the dignity and survival of the most vulnerable.
- The journey towards food security in India requires more than policy; **it demands a commitment to equity, accountability, and the fundamental principle that no one should go hungry in a nation striving for progress**.

## 11. Rat-hole mining: Several workers stuck in a coal mine in Assam

### Why in news?

Three miners were confirmed dead, and six remained trapped in a flooded coal "rat-hole" mine in Assam's Dima Hasao district.

The water level inside the pit is 200 feet deep, and an Indian Navy team with deep-sea divers arrived to assist in rescue operations. The incident occurred in a coal mine in Umrangso, where nine workers aged 26 to 57 were trapped.

Although Dima Hasao has extensive coal and quarrying activities, Assam Chief Minister stated that the mine appears to be illegal.

### What is Rat-hole mining?

#### ● About

- It is a method of **extracting coal from narrow, horizontal seams, widely prevalent in Meghalaya**.
- The term "rat hole" refers to the **narrow pits dug into the ground, typically just large enough for one person to descend and extract coal**.
- Once the pits are dug, miners descend using ropes or bamboo ladders to reach the coal seams.
- The coal is then manually extracted using primitive tools such as pickaxes, shovels, and baskets.

#### ● Types

- **Rat-hole mining is broadly of two types**.
- In the **side-cutting procedure**, narrow tunnels are dug on the hill slopes and workers go inside until they find the coal seam.
  - The **coal seam in hills of Meghalaya is very thin**, less than 2 m in most cases
- The other type of rat-hole mining is called **box-cutting**.
  - In this type, a **rectangular opening is made, varying from 10 to 100 sqm, and through that a vertical pit is dug, 100 to 400 feet deep**.



- Once the coal seam is found, rat-hole-sized tunnels are dug horizontally through which workers can extract the coal.
- **Hazards of Rat-Hole Mining**
  - **Safety Concerns**
    - **Lack of proper ventilation, structural support, and safety gear.**
    - Frequent accidents resulting in injuries and fatalities.
  - **Environmental Impact**
    - Causes land degradation and deforestation.
    - Contributes to **water pollution.**
- **Challenges**
  - **Socioeconomic Challenges**
    - Practices persist due to **economic factors.**
    - Lack of alternative livelihoods for local communities hinders regulation.
  - **Regulatory Issues**
    - Mines are often unregulated despite efforts to ban or control them.
    - The practice continues to face severe criticism for its **risks and environmental damage.**

#### **Ban on Rat-Hole Mining by NGT**

- **NGT Ban and Observations**
  - The **National Green Tribunal (NGT) banned rat-hole mining in 2014 and upheld the ban in 2015.**
  - Highlighted numerous fatalities caused by flooding in mining areas during the rainy season.
- **Focus on Meghalaya**
  - The **ban was specifically enforced in Meghalaya, where rat-hole mining was widely practiced for coal extraction.**
  - Meghalaya's state government appealed the NGT's order in the Supreme Court.

## PRELIMS BOOSTER (THE HINDU, INDIAN EXPRESS & PIB)

1<sup>ST</sup> JANUARY

### 1. National Green Tribunal:

It was **established in 2010 under the National Green Tribunal Act, 2010** for effective and expeditious disposal of cases relating to **environmental protection and conservation of forests** and other natural resources. It is a **specialized body equipped with the necessary expertise to handle environmental disputes involving multi-disciplinary issues**. The Tribunal shall not be bound by the procedure laid down under the Code of Civil Procedure, 1908, but shall be guided by **principles of natural justice**. The Tribunal is mandated to make and endeavour for disposal of applications or appeals finally within 6 months of filing of the case.

**Locations:** **New Delhi is the Principal Place** of Sitting of the Tribunal and **Bhopal, Pune, Kolkata and Chennai** shall be the other four place of sitting of the Tribunal.

**Composition of NGT:** The Tribunal comprises:

**Chairperson:** A retired Supreme Court judge.

**Judicial members:** Retired High Court judges.

**Expert members:** Professionals with at least 15 years of experience in fields related to environment or forest conservation.

### 2. Pobitora Wildlife Sanctuary:

Pobitora wildlife sanctuary is located in **east region of Guwahati, Assam**. It was **established in 1998** with a total area of 48.81 square kilometres. The entire region around the sanctuary is a **part of Brahmaputra flood plains**. The Sanctuary consists of the **Rajamayong Reserve Forest and Pobitora Reserve Forest**. It surrounds a number of small hills such as **Kasasila hills, Hatimuria hill, Boha hill, Kardia hill, Govardan hill, Panbari hill** etc. It is known for holding the highest density of Greater One-Horned Rhinoceros in the country. **Pobitora also holds the distinction of being the source population of the Indian Rhinoceros Vision, 2020 (IRV), Eight Rhinos were translocated from Pobitora Wild life Sanctuary and introduced into Manas National Park.**

**Fauna:** The Grasslands of Pobitora offer sightings of the Greater One Horned Rhinoceros, Wild Water Buffalo, Monitor Lizard, Wild Boar etc.

**Flora:** 72% of Pabitora consists of wet savannah of *Arundo donax*, *Erianthus ravennae*, *Phragmites karka*, *Imperata cylindrica*, and *Saccharum spp.*

**Water hyacinth (*Eichornia crassipes*) is a major problem, especially to waterfowl**, as it forms thick mats on the water surface.

### 3. Norovirus:

It is a common and highly contagious virus that causes **inflammation in the stomach and intestines, a condition known as gastroenteritis**. It is also sometimes referred to as the **'stomach flu' or the 'winter vomiting bug'**. People of all ages can get infected and sick with norovirus, which spreads very easily and quickly. These viruses are responsible for about **90% of viral gastroenteritis outbreaks and close to 50% of cases across the world**. You can get norovirus illness many times in your life because there are many different types of noroviruses.

**Transmission:** They are commonly spread through food or water that is contaminated during preparation or through contaminated surfaces. **Noroviruses can also spread through close contact with a person who has a norovirus infection.**

**Symptoms:** The initial symptoms of norovirus are **vomiting and/or diarrhoea, which show up one or two days after exposure to the virus**. Patients also feel nauseous, and suffer from abdominal pain, fever, headaches and body aches. In extreme cases, loss of fluids could lead to dehydration.

**Treatment:** **No vaccines are currently available to prevent norovirus**. Treatment for the infection focuses on relieving your symptoms. It is important to maintain hydration in the acute phase. In extreme cases, patients have to be administered rehydration fluids intravenously.

### 4. Srisailam Temple:

Srisailam Temple, or **Sri Bhramaramba Mallikarjuna Swamy Temple**, is a **Hindu temple dedicated to Lord Shiva, worshipped here in the form of Mallikarjuna Swamy**. It is located at Srisailam in Andhra Pradesh. It is surrounded by the forests of the **Nallamala Hills**, overlooking the pristine waters of the Krishna River. According to Hindu mythology, the **temple is one of**

the **12 Jyotirlingas**, divine manifestations of Lord Shiva spread across India. The **Goddess Shakti is worshipped as Bramarambha** in the temple and has a shrine dedicated to her. This ancient temple built in the **Dravidian style with lofty towers and sprawling courtyards is one of the finest specimens of Vijayanagara architecture**. Though the exact origins of the temple are not available, the Satavahanas of the 2nd century AD have referred to it. The **Kakatiyas and the Vijayanagara kings have made several endowments** here. The unique feature of this temple is the **combination of Jyothirlingam and Mahasakthi (in the form of Bhramarambika)** in one campus, which is very rare and only one of its kind. The great religious leader **Aadi Sankara is said to have visited this shrine and composed his immortal Sivananda Lahiri here**.

#### **5. INS Sarvekshak:**

It is an **Indian Navy hydrographic survey ship, based at Southern Naval Command in Kochi**. It is fitted with state-of-the-art survey equipment like **Deep Sea Multi-Beam Echo Sounder, Side Scan Sonars** and a fully automated digital surveying and processing system. In addition, the ship carries an integral Chetak helicopter, which would be extensively deployed during the survey. **The ship is the second ship of the Darshak class of ships and has a complement of 15 officers and 175 sailors**. In the past, INS Sarvekshak has also undertaken foreign cooperation surveys in Sri Lanka, Mauritius, Seychelles, Tanzania, and Kenya.

#### **What is Hydrography?**

It is the branch of applied sciences which deals with the **measurement and description of the physical features of oceans, seas, coastal areas, lakes, and rivers, as well as with the prediction of their change over time**. This is done mainly with specialised ships and boats operating echo sounders and sonars, but also using survey aircraft fitted with lasers. Useful information can also be derived sometimes from **satellite observations**. It also involves measuring the **tide and the currents**.

#### **6. Sanjay Gandhi National Park (SGNP):**

SGNP, earlier known as **Borivali National Park**, is a large protected area near Borivali in the northern part of Mumbai. It is situated partly in **Thane District and in Mumbai Suburban District of Maharashtra**. It covers an expansive area of 103 square kilometres, making it

one of the largest parks within the city limits. The park is known for its dense forests, vast birdlife, butterflies, and a small population of tigers. The **Kanheri Caves in the center of the park were an important Buddhist learning center and pilgrimage site sculpted by Buddhist monks** between the 9th and the 1st centuries BCE. They were chiseled out of a massive basaltic rock outcropping. Besides, the park also has two artificial lakes, namely **Tulsi Lake and Vihar Lake**, the deer park, the lion safari, and the Samadhi of Mahatma Gandhi.

**Flora:** Kadamba, Teak, Karanj, Shisham, and species of acacia, Ziziphus, euphorbias, etc are found in this National Park.

**Fauna:** The fauna of the park includes Mongoose, Four-horned antelope, Sambar, Atlas Moth, Wild boar, Languor, Monkey, Magar, and Panthers.

The park also boasts of **251 species of birds and a large variety of butterflies**.

#### **7. About Sea otters**

They are the **smallest marine mammal**, yet the largest member of the weasel family.

**Unique Characteristics:** **Lives entirely in the water throughout its life**. Has the densest fur of any animal on Earth (1 million hairs per square inch). It uses tools to hunt and feed, including rocks to crack open shells and pry abalone off rocks. The **only marine mammal capable of flipping over boulders to search for food**.

**Habitat and Diet:** Inhabit coastal areas with shallow water. Eat on the ocean floor and perform activities such as eating and grooming at the surface.

**Geographical Range:** Found in **Canada, Japan, Mexico, Russia, and the United States**.

**Ecological Importance:** Known as a keystone species, they regulate **populations of herbivores like sea urchins, preventing them from destroying kelp forests**. Help maintain the health of coastal marine ecosystems.

**Threats:** Threatened by **oil spills and other forms of pollution**. Pollution from chemicals and disease-causing organisms in the water harms Sea Otters, affecting their prey and leading to illness and death.

**Conservation Status:** Classified as endangered by the IUCN.

#### **8. Intangible Cultural Heritage (ICH)**

Intangible Cultural Heritage (ICH) refers to **cultural practices, traditions, expressions, knowledge, and skills that are passed down through generations and**

form an integral part of a community's identity and cultural heritage. Unlike tangible heritage (such as monuments or artifacts), ICH is not physical in nature but exists in the form of **traditions and living expressions**.

#### **UNESCO Intangible Cultural Heritage list**

The UNESCO Intangible Cultural Heritage list aims to **recognize and safeguard cultural practices, traditions, and expressions that are integral to human creativity and diversity**. It stems from the 2003 Convention for the Safeguarding of Intangible Cultural Heritage, coming into force in 2008.

#### **9. About Vasilopita**

The Vasilopita is a **traditional Greek cake baked to celebrate the New Year**. A coin, known as **flouri**, is hidden inside the cake, and the person who finds it is believed to receive good fortune, love, and health for the year ahead.

**Origin of the Tradition:** The tradition is rooted in legends associated with **Saint Basil, who is akin to Santa Claus in Greece**.

**Tribute:** Vasilopita means **"Sweet Bread of Basil"** and honors Saint Basil, a bishop known for his generosity. The first slice is dedicated to Jesus Christ, the second to the Virgin Mary, and the third to Saint Basil.

#### **10. Tamu Lhosar Festival**

It is celebrated by the **Gurung community to mark the New Year and bid farewell to the past year**. In the Gurung language, **"Lho"** means year, and **"Sar"** denotes change. Tamu Lhosar is celebrated on the **15th of the Nepali month Push (December-January)**. The festival coincides with the longest night of the year, after which the night's duration begins to shorten.

**Celebration Areas:** The festival is observed with great enthusiasm in districts of Nepal with a significant Gurung population, including **Lamjung, Gorkha, Tanahun, Syangja, Manang, Kaski, and Parbat**.

**Cultural Programs:** Gurung community members organize feasts and cultural events to celebrate the occasion.

#### **11. State Funeral**

A state funeral is a ceremonial event for **important figures, following set rules, involving public mourning**. It is typically reserved for the **death of the President,**

**Prime Minister, a former President, or a Governor in India**. However, in individual cases, the government may order a state funeral for other dignitaries.

**Rules for State Funeral:** The funeral is attended by gazetted officers and service personnel dressed in formal state attire. The **Ministry of Defence organizes the arrangements, following notifications from the Ministry of Home Affairs**

#### **12. Financial Stability Report (FSR)**

The Financial Stability Report (FSR) is a **biannual publication by the Reserve Bank of India (RBI) that assesses the stability and resilience of the Indian financial system**. It offers insights into the health of various components of the financial sector, including banking, non-banking financial institutions (NBFCs), mutual funds, insurance companies, and financial markets.

#### **13. Good Governance Index**

##### **About**

It was launched on **December 25, 2019, the birth anniversary of late prime minister Atal Bihari Vajpayee which is observed as Good Governance Day**. The index covers over 50 indicators across sectors, including **agriculture, economic governance, public health, and citizen-centric governance**. Tamil Nadu and Gujarat got first place among big states in the 2019 and 2021 rankings, respectively.

##### **Good Governance Day**

The day is celebrated on the **25th of December every year on the birth anniversary of former Prime Minister Atal Bihari Vajpayee**. In 2014, the government announced that December 25 would be celebrated as Good Governance Day. It was established with the slogan **"Good Governance through e-Governance."**

##### **2<sup>ND</sup> JANUARY**

1.



Year-end Review 2024:

Ministry of Environment,  
Forest and Climate Change

Tiger Reserves in India reach 57!

Blue Flag Beaches

- 13 beaches across 6 States and 3 Union Territories awarded Blue Flag Certification for 2024-2025

Mission LIFE: UNEA adopted Resolution on Sustainable Lifestyles, inspired by Mission LIFE

Voice of Global South Summit

- India hosted the 3rd Voice of Global South Summit with the theme: 'An Empowered Global South for a Sustainable Future'

First-ever Ganges River Dolphin Tagging

- First-ever Ganges River Dolphin Tagging successfully conducted in Assam



2/2

## 2. Di-Ammonium Phosphate (DAP):

It is one of the most widely used fertilizers globally, providing essential nutrients —**nitrogen (N) and phosphorus (P)**—for plant growth. It is the **second most commonly used fertilizer in India after urea**. It is high in phosphorus (P) that stimulates root establishment and development-without which plants cannot grow to their normal size or will take too long to mature. It's **highly soluble** and thus dissolves quickly in soil to release **plant-available phosphate and ammonium**.

DAP has additional uses, including:

- As a **fire retardant**. For example, a mixture of DAP and other ingredients can be spread in advance of a fire to prevent a forest from burning.
- In various industrial processes, such as **metal finishing**.
- An addition to **wine to sustain yeast fermentation**.
- An addition to **milk to produce cheese cultures**.
- It proves as a flux for soldering tin, copper, brass, and zinc.

## 3. Central Groundwater Board (CGWB):

CGWB is a **multi-disciplinary scientific organization of the Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti, Government of India**. It is the National Apex Agency entrusted with the responsibilities of providing scientific inputs for management, exploration, monitoring, assessment, augmentation, and regulation of groundwater resources of the country.

**Mandate:** Develop and disseminate technologies and monitor and implement national policies for the scientific and sustainable development and management of India's groundwater resources, including their **exploration, assessment, conservation, augmentation, protection from pollution, and distribution, based on principles of economic and ecological efficiency and equity**.

**Headquarters:** Bhujal Bhawan, Faridabad, Haryana.

## 4. Tinnitus:

It is the **perception of sound that does not have an external source**, meaning only the affected individual can hear it.

**Causes:** It is usually caused by an underlying condition, such as **age-related hearing loss, an ear injury or a problem with the circulatory system**.

**Symptoms:** It can include sleep disturbances, depression, anxiety, irritability, and significant impacts on mental health and social life. It can also cause other types of phantom noises in your ears, including: Buzzing, Roaring and Clicking etc.

**Treatment:** It may include hearing aids, sound-masking devices, medicines, and ways to learn how to cope with the noise.

## 5. Tobacco Board of India:

It is a **statutory body established on 1st January 1976 by an Act of Parliament "Tobacco Board Act, 1975 (Act 4 of 1975)"**. The Board is headed by a chairperson and is responsible for the development of the tobacco industry.

Functions:

- The primary function of the Board is **export promotion of all varieties of tobacco and its allied products**, its functions extend to production, distribution (for domestic consumption and exports) and regulation of Flue Cured Virginia (FCV) tobacco.
- It ensures the **smooth functioning of the farming system** and to ensure fair and remunerative prices for tobacco farmers and the promotion of exports.
- Financial assistance is extended to farmers through banks**, along with the necessary inputs for the production of quality tobacco.
- The Board also engages in **extension and developmental activities to promote sustainable tobacco cultivation practices**.

- The Board supports farmers by providing handholding assistance to produce tobacco of requisite quality to meet the standards of importing countries.

**Headquarters: Guntur, Andhra Pradesh**

**Nodal Ministry: Ministry of Commerce and Industry**

**India's Tobacco Industry:**

**India is the 2nd largest producer of tobacco in the world after China.** India is the 4th largest producer of FCV tobacco in the world after China, Brazil and Zimbabwe. India is the **2nd largest exporter of unmanufactured tobacco (quantity terms) after Brazil.**

### **6. About Vembanad Lake**

**Name & Location:** Locally known as **Vembanad Kayal**, it is the **longest lake in India** and the largest lake in Kerala (covering the districts of Alappuzha, Kottayam, and Ernakulam).

**Recognition:** **Declared a Ramsar site in 2002**, signifying its global importance as a wetland.

**Rivers and Sea:** Formed from four rivers – the **Meenachil, Achankovil, Pampa, and Manimala**, the lake also has an outlet to the Arabian Sea in the west. It serves as a major source of freshwater for the state but also has brackish water areas.

**Snake Boat Race:** It is a hub of backwater tourism in the state and hosts the renowned **Nehru Trophy Boat Race**, popularly known as the **Snake Boat Race**, in one of its section

### **7. What are Neutrinos?**

Neutrinos, discovered in **1959**, are **tiny, electrically neutral subatomic particles, similar to electrons**. They are the second most abundant particles in the universe after photons. They **rarely interact with matter, earning them the nickname "ghost particles."** Neutrinos pass through vast amounts of matter, with billions passing through a cubic centimeter of space every second.

### **8. Cubic Kilometre Neutrino Telescope (KM3NeT)**

**KM3NeT** is an **underwater neutrino telescope deployed under the Mediterranean Sea**. It aims to detect high-energy neutrinos by observing flashes of Cherenkov radiation (light produced when neutrinos interact with water or ice molecules). The **dark, transparent depths of the sea provide ideal**

**conditions for detecting these interactions, as they allow for the detection of Cherenkov radiation.**

### **9. What is Belly-Landing?**

A belly landing, also sometimes called a **gear-up landing**, happens when a plane lands without its **landing gear extended**. This means the plane's underside, or fuselage, makes contact with the runway instead of the wheels. Belly-landings are rare and typically used in emergencies when: The landing gear fails to deploy. Pilots opt for it due to safer stopping options without wheels.

**3<sup>RD</sup> JANUARY**

### **1. Brazilian Velvet Ant:**

Velvet ants are a group of **parasitic wasps that are well known for a suite of defensive adaptations including bright coloration and a formidable sting.**

**Appearance:** They are wasps, some of which are wingless, and are named in part for their exteriors. Velvet ant is known for its distinct black and white markings.

**Habitat:** It is found in shrub desert in **Brazil called the Caatinga.**

**Characteristics:** It demonstrates remarkable mobility and covers significant distances in pursuit of hosts on the ground. It is **usually found throughout the day, peak activity typically coincides with the early morning and late afternoon, during periods of subdued sunlight.** It is recently found that the black parts on female velvet ants were actually ultrablack so that they absorbed nearly all visible light.

### **Why this finding is Unique?**

Ultrablack pigmentation is rare in the animal kingdom. In organisms that have it, it helps them **hide from predators, regulate body temperature or even attract mates**, as the contrast against brighter colors can be visually enticing.

### **2. Melatonin**

It is a **neurohormone secreted from the pineal gland of the brain in response to darkness**. It is related to the timing and quality of our sleep and wake rhythms and determined by our internal body clock. **It makes us sleepy at certain times of the day.** It starts to secrete when our bodies are getting ready to go to sleep and usually takes about 30 to 45 minutes to take full effect.

Melatonin secretion is at its highest in the middle of the night and gradually starts to decrease until we are ready to wake up and start our day.

**3. Parkinson's disease:** It is a progressive neurological disorder that affects the nervous system and the parts of the body controlled by the nerves. It is a condition in which a patient has limited or no control over his movements and body balance. The risk of developing Parkinson's disease naturally increases with age, and the average age at which it starts is 60 years old. Many studies have suggested that men are more likely to be affected by Parkinson's than women.

**Cause:** It is caused by the degeneration of nerve cells in the part of the brain called the substantia nigra, which controls movement. These nerve cells die or become impaired, losing the ability to produce an important chemical called dopamine. Dopamine operates with other neurotransmitters to help coordinate the millions of nerve and muscle cells involved in the movement. Lack of dopamine causes the slowed movements and tremors symptoms of Parkinson's disease.

**Treatment:** There's no cure for this disease, but treatments can help significantly improve your symptoms.

#### **4. Gomti River:**

It is a tributary of the Ganges (Ganga) River, flowing entirely through the State of Uttar Pradesh.

**Course:** It originates from the Gomati Tal, also called Fulhaar Jheel, which is found near the Madho Tanda in the Pilibhit district in Uttar Pradesh. The river drains the area between rivers Ramganga and Sharda. After flowing southwards through the districts of Lucknow, Barabanki, Sultanpur, Faizabad, and Jaunpur, it joins the River Ganga. It is a perennial river, characterised by sluggish flow throughout the year, except during the monsoon season, when heavy rainfall causes a manifold increase in the runoff.

#### **5. Business Ready (B-READY) 2024**

India is facing challenges in achieving good scores in the World Bank's Business Ready report.

##### **About**

The B-READY report, launched by the World Bank, benchmarks the business environment and investment climate across economies. It evaluates

regulatory frameworks, public services, and their effectiveness in facilitating business operations, replacing the previous Doing Business index.

#### **6. Key Facts on Administering Injections**

- **Intramuscular:** This injection is made to go deep into the muscle. The needle will be placed at a 90-degree angle (perpendicular) to the skin to allow for penetration into that tissue.
- **Intravenous:** The needles used for either injections or removal of blood should be placed where a vein is readily accessible. The needle should be inserted at an angle of 25 degrees to the skin.
- **Intradermal:** This injection requires the needle to be placed just under the epidermis (outer layer of skin) and into the dermis (inner layer of skin).
- **Subcutaneous:** Needle to be placed underneath the two layers of skin (epidermis and dermis). The needle will be placed at an angle of 45 degrees to the skin surface.

#### **7. Project-75**

Project 75 includes the indigenous construction of six diesel electric attack submarines of Scorpene class. The submarines are being constructed by the Mazagon Dock Shipbuilders Limited (MDL) in Mumbai in collaboration with the Naval Group of France. Under the project INS Kalvari, INS Khanderi, INS Karanj and INS Vela were commissioned between 2017 and 2021. The fifth submarine, INS Vagir, was commissioned recently. The sixth submarine Vagsheer is the last from the project.

#### **7 JANUARY**

**1. Panchayat Se Parliament 2.0:** It will be organised by the National Commission for Women (NCW), in collaboration with the Lok Sabha Secretariat and the Ministry of Tribal Affairs. The programme is being organised in commemoration of the 150th birth anniversary of Bhagwan Birsa Munda, the revered tribal leader and freedom fighter. It will bring together 502 elected women representatives from Scheduled Tribes across 22 states and Union Territories. Its primary focus is to empower these women representatives from Panchayati Raj institutions by enhancing their understanding of constitutional

provisions, parliamentary procedures, and governance. It will include workshops, sessions, and a guided tour of key locations such as the **new Parliament House, Samvidhan Sadan, Pradhanmantri Sangrahalaya, and Rashtrapati Bhawan**. The Lok Sabha Speaker will also lead the delegates in reading the Preamble to the Constitution of India during the event. This program builds on the success of the **Panchayat Se Parliament 2024 initiative, which engaged 500 women sarpanch from across India**.

**2. Mucuna bracteata:** It is an **invasive cover crop**, planted in the inter-rows of rubber and oil palm. It is a **leguminous vine** which was introduced to rubber plantations as a weed protectant and nitrogen regulator valued for its drought tolerance. Its **proliferation now extends to parts of the Western Ghats in the Kannyakumari district including places such as Kaliyal, Kadayalumoodu, Aarukani and Kodayar and Kulasekaram**. This creeper was introduced with the intention of protecting the rubber trees, it has become a threat as it has started to overpower and cover the trees. It has begun to overtake large tracts of Kodayar region and has even climbed over native trees, affecting their growth. **Most of the regions adjoin the buffer zone of Kalakkad-Mundanthurai tiger reserve, announced as a critical tiger habitat.**

**3. Polavaram Project:** It is a multi-purpose irrigation project built on the **Godavari River in West Godavari district and East Godavari district in Andhra Pradesh**. It involves the **construction of a dam to address water scarcity**, boost agricultural productivity, and generate power. Designed to withstand massive floods that could occur once in 1000 years, the **Polavaram Spillway is set to have the highest discharge capacity in the world**. At 50 lakh cusecs, it is set to surpass even the 3 Gorges Dam of China, one of the largest dams in the world. It has been **accorded national project status by the central government**.

**4. Nanopore Technology:** Nanopore technology refers to **nano-scale holes embedded in a thin membrane structure to detect the potential change when charged biological molecules smaller than nanopores pass through the hole**. It has the potential to sense and analyze single-molecule amino acids, DNA, RNA, etc. It is a cutting-edge method for

sequencing DNA and RNA by detecting changes in electrical conductivity as molecules pass through a nanopore. In contrast to other sequencing technologies, nanopore-based sequencing is cheaper, very easy to use, does not require much computational and lab infrastructure, and only needs a small amount of DNA in a test sample. It is the **only sequencing technology that offers real-time analysis in fully scalable formats, from pocket to population scale**, that can **analyze native DNA or RNA and sequence any length of fragment to achieve short to ultra-long read lengths**. It can also undertake targeted sequencing with a focus

**5. Rani Velu Nachiyar:** She was the only child of Raja Chellamuthu vijayaragunatha Sethupathy and Rani Sakandhimuthal of the Ramnad kingdom. At the age of 16, she married the **prince of Sivaganga, Muthuvaduganathur Udaiyathevar**. She is known by **Tamils as Veeramangai**. She was trained in war to match weapons usage, martial arts like **Valari, Silambam(fighting using the stick), horse riding and archery**. She was skilled in the art of warfare and weaponry, Velu Nachiyar was also a scholar, and mastered several languages including English, French and Urdu. In collaboration with Hyder Ali and Gopala Nayaker, she waged a war against the British and emerged victoriously. **She was the first queen to fight for the freedom from the British in India**. She granted powers to the Marudu brothers to administer the country in 1780.

### **6. Benefits of Digital Transformation in Governance**

- **Enhanced Efficiency:** Digital tools streamline **administrative processes**, reducing the time and effort required to deliver services. It leads to **faster decision-making and improved service delivery**.
- **Increased Transparency:** Digital platforms enable **real-time tracking of government activities, making it easier for citizens to access information and hold officials accountable**. It helps build trust between the government and the public.
- **Improved Accessibility:** Digital governance initiatives ensure that government services are accessible to all citizens, regardless of their location. It is **particularly beneficial for rural and remote areas**, where access to government services has traditionally been limited.

- **Cost Reduction:** Automation and digitization have led to significant cost savings in government operations.
- **Inclusiveness and Citizen Engagement:** Digital platforms have made government services more accessible to citizens, including those in remote areas. Digital platforms provide citizens with opportunities to participate in **governance processes, voice their opinions, and provide feedback**. It fosters a **more inclusive and participatory form of governance**

**7. iGOT Karmayogi Platform:** It is an **online training portal, launched in 2020**, aims to equip government officials with essential skills in data analytics, public administration, and digital technologies. The flexibility of personalized learning paths fosters continuous improvement, a vital trait where adaptability defines success.

**e-Office Initiative:** It **digitizes government workflows, drastically reducing reliance on paperwork and enhancing operational efficiency**. By automating file management, workflows, and grievance redress, the initiative promotes real-time communication and transparency

## 8 JANUARY

**1. Dozer Push Mining Method:** It is an **unmanned, automated machinery to optimizes the mining process which ensures that vibration and flyrock are controlled within safe limits**. It is an innovative approach developed by CSIR-CIMFR which aims to enhance safety and operational efficiency in mining processes.

**Advantages:** It offers a viable alternative to the conventional truck-shovel mining technique or shovel-dumper and dragline methods. It offers distinct advantages such as **improved efficiency by enabling faster coal recovery, reducing delays caused by adverse weather conditions such as the monsoon season and highly cost-effective, with an estimated 7-10% reduction in operational costs** compared to conventional methods. Additionally, it enhances productivity by improving the utilization of dragline machines and reducing unit costs. Moreover, the unmanned operation of the Dozer Push Mining method greatly enhances worker safety, minimizing the risks

associated with manual labor and traditional mining techniques.

### **2. BHARATPOL Portal:**

It will streamline the processing of all requests for international assistance through INTERPOL, including the issuance of Red Notices and other colour-coded INTERPOL notices. It will become a **transformative tool for field-level police officers, enhancing their efficiency in dealing with crimes and security challenges**. By facilitating easier and faster access to international assistance, it will strengthen India's efforts in combating transnational crimes. It will significantly facilitate Indian Law Enforcement Agencies (LEAs) enabling real-time information sharing for faster access to international police assistance. It will be **developed by Central Bureau of Investigation (CBI)**.

### **3. Alakananda River:**

The **Alaknanda River is one of the two main headstreams of the Ganges River, the other being the Bhagirathi River**. It originates from the meltwaters of the Satopanth and Bhagirath Kharak glaciers in the Garhwal Himalayas of Uttarakhand. The river is joined by many tributaries in Uttarakhand. Five of the tributaries are considered major, and their **points of confluence are also worshipped as Panch Prayag**.

**They are listed below:**

**Vishnuprayag:** Alaknanda meets Dhauliganga River

**Nandprayag:** Alaknanda meets Nandakini River

**Karnaprayag:** Alaknanda meets Pindar River

**Rudraprayag:** Alaknanda meets Mandakini River

**Devprayag:** Alaknanda meets Bhagirathi. This is the **most revered confluence**, as it is here when the surging water coming from the mountains are finally called the Ganga.

At the time of formation of Ganga, **Alaknanda's contribution to the flow is larger than that of Bhagirathi**. From its source till its union with Bhagirathi, Alaknanda travels for 190 km (approx.). Along the banks of the **Alaknanda are numerous important pilgrimage sites such as Badrinath, Hemkund Sahib, and Joshimath**. The Alaknanda River valley is a significant part of the **Char Dham Yatra, a pilgrimage circuit that encompasses four sacred sites—Badrinath, Kedarnath, Gangotri, and Yamunotri**.

**4. Vembanad Lake:** It is the longest lake in India and the largest lake of Kerala. It is spread across an area of 2,033 sqkm., across Alappuzha, Kottayam, and Ernakulam districts. It is also known as Vembanad Kayal, Vembanad Kol, Punnamada Lake (in Kuttanad), and Kochi Lake (in Kochi).

Formed from four rivers – the Meenachil, Achankovil, Pampa, and Manimala, it also has an outlet to the Arabian Sea in the west. The lake surrounds the islands of Pathiramanal, Perumbalam, and Pallippuram and is a popular backwater stretch in Kerala.

Vallam Kali (i.e Nehru Trophy Boat Race) is a Snake Boat Race held every year in the month of August in Vembanad Lake.

The Kumarakom Bird Sanctuary is located on the east coast of the lake. It was declared as a Ramsar site of international importance in 2002.

#### **5. Particularly Vulnerable Tribal Group**

In 1973, the Dhebar Commission set up a separate category for Primitive Tribal Groups (PTGs). In 1975, the Union identified 52 tribal groups as PTGs. In 1993, 23 more groups were added to the list. Later, in 2006, these groups were named PVTGs. PVTGs are a more vulnerable group among tribal groups in India. These groups have primitive traits, geographical isolation, low literacy, zero to negative population growth rate and backwardness. Moreover, they are largely dependent upon hunting for food and a pre-agriculture level of technology. It is said that more developed tribal groups take advantage of the development funds, and thus, there is a need to direct more funds towards PVTGs. According to the 2011 Census, Odisha has the largest population of PVTGs followed by Madhya Pradesh.

#### **6. About Maiya Samman Yojana**

The scheme increased the amount from ₹1,000 to ₹2,500 per woman aged 18 to 50. The scheme requires women to have bank accounts, bringing millions of women into the formal banking system. The ₹2,500 installment was transferred for December, and January's installment will be transferred later.

#### **7. Coffee & Production in India**

Coffee is an important beverage used all over the world. It requires a warm, wet climate and well-drained loamy soil. Hill slopes are ideal for its growth. India produces Arabica (mild flavor, higher market

value) and Robusta (strong flavor, used in blends). India became the world's eighth-largest coffee grower in 2022-2023.

**Regional Production:** Karnataka is the largest producer (71%). Kerala follows with 20%. Tamil Nadu produces 5%, mainly in Nilgiri. Smaller contributions come from Orissa and northeastern areas.

#### **8. PanchPran (Five Pillars of National Transformation)**

**About:** PanchPran refers to the five pledges announced by Prime Minister Narendra Modi during his Independence Day speech in 2022. These pledges aim to guide India towards a developed nation by 2047. These are:

- **Social Harmony:** Promoting unity through diversity and transforming it into a cohesive force for the nation.
- **Family Enlightenment:** Strengthening patriotic values at the grassroots level by nurturing these qualities within families.
- **Environmental Consciousness:** Honouring Bharat Mata by protecting and conserving the environment for a sustainable future.
- **Swadeshi and Self-Reliance:** Symbols of Atmanirbhar Bharat, fostering self-sufficiency and indigenous development.
- **Civic Duties:** Guiding citizens towards progress through adherence to civic responsibilities.

### **9 JANUARY**

#### **1. Nitrogen Use Efficiency:**



It is a term that is used to describe the efficiency of a plant in using applied or fixed nitrogen for biomass production. It is further defined as the ratio between crop yield and the amount of nitrogen absorbed from the soil through roots or from the atmosphere through fixation by bacteria. NUE is an important trait in crop breeding programs, which aims to improve crop yield while reducing input costs, such as fertilizers, and

at the same time keeping nitrogen out of the environment.

**Issues with Traditional methods:** They can lead to **increased operational costs for farmers** and contribute to environmental issues, such as the **emission of nitrogen oxides (NO<sub>x</sub>) during fertilizer production, contributing to global warming.**

**Significance of Nitric oxide (NO):** It plays a pivotal role in regulating various physiological processes in plants. It is involved in the **activation of high-affinity nitrate transporters, which are crucial for nitrogen uptake,** especially under low nitrogen conditions.

## **2. Toda Tribe:**

It is one of the oldest ethnic groups residing in the **Nilgiris Hills in Tamil Nadu.** It is divided into five clans, namely: Paiki, Pekkan, Kuttan, Kenna and Todi.

**Language: They have their own language, without a script.** They live in a closed community or hamlet called mund.

**Society: It is a patrilineage descent group** whose membership is based upon a rule of patrilineal descent. Their community is divided into two endogamous groups, namely **Tharthazoll and Theveioll.** To maintain the social harmony or solidarity among the Toda tribal population of Todas are controlled for many generations by their own traditional Government called 'Noim'. **This Noim is headed by a Toda tribal head-man is called Monegar.** He has the full power to control the Todas and he also dispenses justice in the Toda community They celebrate '**Modhweth' festival, which is also called buffalo festival** every year during the last Sunday of December or on the first Sunday of January.

## **3. Twigstats:**

It is a **time-stratified ancestry analysis tool that boosts the statistical power of existing methods by a magnitude and reduces statistical errors.** It has determined more precisely than ever individual-level ancestry at a very high resolution. It is **coded in C++** and employing the statistical language R. It allows researchers to focus on a specific period in history with more fine-grained analysis than previously possible.

## **4. Techniques used for Genetic analysis:**

**Single Nucleotide Polymorphisms (SNPs):** This method has been extensively used to **reconstruct genetic histories and ancestry models using ancient genetic**

**material (aDNA).** The analysis of SNPs is a powerful technique when the task is to understand populations, but it's restricted by the need for high quality DNA samples and its inability to resolve the histories of groups with closely related ancestors.

**Haplotypes Method:** This method captures information from haplotype-sharing or identity-by-descent and a rare variant simultaneously includes time-resolved information about genetic ancestry, and provides comprehensive insights into how individuals 'share' their ancestors.

**Genealogical tree inference method:** Researchers have applied this to modern and ancient genomes to understand their population structure, demographics, locations of ancestors, etc.

## **5. Tipeswar Wildlife Sanctuary:**

It is located in the **district of Yavatmal, Maharashtra.** There are plenty of rivers such as **Purna, Krishna, Bhima and Tapti irrigate the sanctuary from entire angles.** Having lots of water from all these rivers, it is also popularly known as Green Oasis located in Southern Maharashtra. This **area is completely a basalt area** that is constructed by the blast of lava a century back

**Vegetation:** The place is quite hilly and undulated and thus has different types of vegetation cover that varies with the altitude.

## **6. Sri Ranganathaswamy Temple:**



It is a prominent Hindu temple situated at **Srirangam near Trichy in Tamil Nadu.** This temple is the biggest functioning Hindu temple in India. **Built across an area of 156 acres, this temple is dedicated to Ranganatha, a reclining form of Hindu deity, Lord Vishnu.** It is the foremost of the eight self-manifested shrines of Lord Vishnu. This temple lies on an islet formed by the twin rivers **Cauvery and Coleroon.** Though the temple existing since the 2nd century BC, the archaeological inscriptions are available only from the 10th century CE. This temple underwent many

changes during the rule of Cholas, Cheras, Pandiyas, Hoysalas, Vijayanagar kings and Nayak of Madurai.

**Architecture:** The entire temple complex is a perfect example of Dravidian architecture. Apart from the 7 enclosures with massive walls, the temple complex has 21 very colorful sculpted gopuras, 50 sub-shrines, 9 sacred pools, and a golden Vimana (dome) over the sanctum sanctorum of the presiding deity. The vimana over the sanctum of the temple is made up of gold. **The 236-foot Rajagopura (tower) is the tallest temple tower in India.** There is also a royal temple tower, which covers a base area of 32,500 sq. ft. and has a height of 196 ft. It also comprises a hall containing 1000 pillars. Intricate sculptures are the most attractive part of the hall. **The Hall was built during the Vijayanagara period (1336-1565).**

### **7. About UJALA scheme**

It was launched as the **Domestic Efficient Lighting Programme (DELP)** and later rebranded, UJALA to revolutionise household lighting by providing **affordable energy-efficient LED bulbs, tube lights, and fans to millions of Indian homes.** It is a joint effort by **Energy Efficiency Services Limited (EESL) and DISCOMs under the Ministry of Power.**

**Implementation Model:** EESL handled initial costs, with repayments made through monthly or quarterly annuities by municipalities. Ensured over 95% uptime for LED streetlights, enhancing public safety and reliable municipal services.

### **Street Lighting National Programme (SLNP)**

It was **launched alongside UJALA on 5th January 2015.** It replaced outdated streetlights with energy-efficient LED streetlights in urban and rural areas. It is **aimed at reducing energy consumption and operational costs for public lighting**

### **8. PLI Scheme**

Initially launched for three sectors to address the need to boost domestic manufacturing during COVID-19 lockdown, the PLI scheme was later extended to include steel. **The first round of the PLI Scheme for Specialty Steel was notified in 2021.** The objective of the PLI scheme for specialty steel is to **promote manufacturing of value-added steel grades within the country** and help the Indian steel industry mature in terms of technology as well as move up the value chain.

### **9. About Anji Khad Bridge**

**Length:** 725.5 meters

**Cable-Stayed Span:** 473.25 meters supported by 96 cables (ranging from 82 to 295 meters).

**Built By:** Indian Railways

**Project:** Part of the Udhampur-Srinagar-Baramulla Rail Link (USBRL) Project

**Connectivity:** Links Katra and Reasi, addressing challenging terrain in the Anji River Valley.

It stands at an impressive height of 331 meters from the riverbed.

### **10. Selective silencing**

**Selective silencing:** It refers to the **inactivation of one parent's copy of a gene in certain cells.** This process blocks the expression of a specific gene's message.

**Mechanism:** Every cell (except sperm and egg cells) has two copies of each gene—one from each parent. In **selective silencing, one of these copies is turned off, leading to a bias in gene activity.**

**Disease Implications:** Selective silencing could explain why individuals with genes linked to diseases may not show symptoms. By inactivating the disease-prone copy, the body may mitigate the harmful effects of the gene.

## **10 JANUARY**

### **1. AnemiaPhone:**

It is a technology developed by **Cornell University (United States)** researchers to **accurately, quickly and cheaply assess iron deficiency.** It has been transferred to the Indian Council of Medical Research (ICMR) for integration into its programmes for anemia alleviation, women's health, and maternal and child health. **AnemiaPhone would enable access to rapid screening and diagnosis of iron deficiency at the point of need.** Iron deficiency is a leading cause of anemia, which affects 50% to 70% of pregnant women in India.

#### **How it Works?**

**The technology requires a small finger stick,** a drop of blood on a test strip similar to a COVID-19 home test, and a few minutes for the reader to assess. **The information is uploaded to a clinical database via mobile phone, wireless tablet, or computer.** Healthcare workers can interpret the test and provide guidance, triage and referral, or intervention on the spot.



### **2. Global Energy Alliance for People and Planet:**

It is an alliance of philanthropists, governments, technology, policy, and financing partners. Its **mission is to enable emerging and developed economies to shift to a clean energy, pro-growth model that accelerates universal energy access and inclusive economic growth** while supporting the global community to meet critical climate goals during the next decade. It aims to reduce 4 gigatons of future carbon emissions, expand clean energy access to one billion people, and enable 150 million new jobs.

### **3. Pravasi Bharatiya Divas:**

It is the **flagship event of the Ministry of External Affairs since 2003**. It is held in different cities, to showcase the diversity and progress of different regions of India. Since **2015, it has evolved into a biennale event, with theme-based conferences held in the intervening years**. Held on **January 9th**, it commemorates the day when Mahatma Gandhi returned to India from South Africa in 1915.

The primary goals of Pravasi Bharatiya Divas are:

- To recognize the **contributions of the Indian diaspora to India's development**
- To create a better understanding of Indians abroad
- To **support India's causes and work for the welfare of local Indian communities worldwide**
- To provide a platform for overseas Indians to engage with the government and people of their ancestral land

These conventions have proven instrumental in fostering connections between India and its vast overseas community, enabling the sharing of experiences, knowledge, and skills across various fields. **The theme for this year is the "Diaspora's contribution to a Viksit Bharat" (Developed India).**

### **4. Indo-Tibetan Border Police (ITBP):**

It is one of the **Central Armed Police Forces of India**.

**Background:**

It was **raised in 1962, in the wake of the Sino-Indian War of 1962 for deployment along India's border with China's Tibet Autonomous Region**. ITBP was initially raised under the CRPF Act. However, the Parliament enacted the Indo-Tibetan Border Police Force Act, 1992 and the rules under it were framed in 1994. In 2004, ITBP was declared as a full-fledged central armed police force under the Ministry of Home Affairs. **The**

**motto of the Force: "Shaurya-Dridhata-Karma-Nishtha" (Valour – Determination – Devotion to Duty)**. This force guards 3,488 km long India-China border through 197 BOPs situated at altitudes ranging from 9,000 ft to 18,750 ft from Karakoram Pass in Ladakh to Jachep La in Arunachal Pradesh. It is a **specialized mountain force and most of the officers and men are professionally trained mountaineers and skiers**.

**Headquarter: New Delhi**

### **5. EmpowHER Biz Initiative:**

It is a **part of Women Entrepreneurship Platform of NITI Aayog, aiming to create a robust retail ecosystem that empowers women entrepreneurs and drives sustainable growth in the sector**. It will offer mentorship and comprehensive training, covering retail management, digital tools, financial literacy and business development to aspiring women entrepreneurs. Under the initiative, **50 participants aged 18–35, will be selected through an online application process based on specific criteria. Top 20 of these participants will receive a 100% waiver on New Shop franchise fees, empowering them to own and operate their retail businesses with significantly reduced barriers to entry**. The program is being launched for women from **Delhi NCR, Punjab, Rajasthan, Uttar Pradesh, Haryana, Madhya Pradesh, and Gujarat**.

### **6. What is Soapstone?**

Soapstone is a **metamorphic rock composed mainly of talc, a naturally occurring mineral**. It is widely used for; Construction and interior design (e.g., countertops, sinks, hearths, sculptures). Industrial applications such as cosmetics and pharmaceuticals due to its softness and heat resistance. According to the **Indian Bureau of Mines, the states of Rajasthan (57%) and Uttarakhand (25%) boast substantial reserves of soapstone in India**.

### **7. Classical Languages**

India had six classical languages — **Tamil, Sanskrit, Telugu, Kannada, Malayalam, and Odia**. Tamil was declared a classical language in 2004, Sanskrit in 2005, Kannada in 2008, Telugu in 2008, Malayalam in 2013, and Odia in 2014. **All the Classical Languages are listed in the Eighth Schedule of the Constitution**.

### **8. Bhashini Project**

It was launched in 2022. It is part of the broader National Language Translation Mission (NLTM). It aims to enable easy access to the internet and digital services in Indian languages, including voice-based access, and help create content in Indian languages.

### **9. About World Economic Forum (WEF)**

The World Economic Forum (WEF) is an international organization for public-private cooperation. It was founded in 1971 by Professor Klaus Schwab and is headquartered in Davos, Switzerland. The WEF brings together leaders from business, government, academia, and civil society to discuss and address global challenges, with the aim of improving the state of the world.

### **10. Androgen signaling**

Androgen signaling refers to the process by which androgens, a group of male sex hormones including testosterone and its derivatives, exert their effects on cells and tissues. The activation of androgen receptors influences various biological processes, such as:

- **Development of male secondary sexual characteristics:** These include facial hair, deep voice, and muscle mass.
- **Anabolic effects:** They promote protein synthesis and muscle growth, contributing to physical strength and body composition.
- **Reproductive health:** Androgens play a role in sperm production, and other aspects of male reproductive health.
- **Neurodevelopment and behavior:** Androgen signaling also affects the central nervous system, influencing mood, cognition, and behavior.

**13 JANUARY**

### **1. Trichophyton indotinea:**

It is a fungal pathogen that can cause difficult-to-treat skin infections that are widely reported from India. The fungus was named after India in 2020 by a Japanese group on the basis of two isolates from India and Nepal, following an academic practice of identifying a new pathogen after the country where it was first sighted. The fungus has been documented in over 40 countries. It belongs to the dermatophyte

group. Dermatophytosis is the superficial infection of the skin, hair, and nails by dermatophyte fungi. indotinea causes inflammatory and itchy dermatophytosis affecting the groins, gluteal region, trunk, and face. Patients of all ages and genders are affected. It spreads through direct skin contact and contaminated objects (e.g., towels, clothing). It is resistant against the first-line antifungal agent

**2. Keoladeo National Park:** The Keoladeo National Park, formerly known as the Bharatpur Bird Sanctuary, is located in the eastern part of Rajasthan. Declared a national park in 1981, it was renamed Keoladeo for the ancient temple in the park dedicated to the Hindu god Shiva. It is strategically located in the middle of the Central Asian migratory flyway. It is spread across 2,873 hectares of woodlands, grasslands, wetlands, and woodland swamps. It is a Ramsar site and also a UNESCO World Heritage Site.

### **3. UN Committee of Experts on Big Data and Data Science for Official Statistics**

Recently, India has joined the UN Committee of Experts on Big Data and Data Science for Official Statistics (UN-CEBD). It was created in 2014, with Australia as its first Chair, to investigate the benefits and challenges of Big Data, including the potential for monitoring and reporting on sustainable development goals.

**Governance:**

**Advisory Board:** It is the management body of the UN-CEBD. It is scheduled to meet about 4 times per year to review the work of the UN-CEBD and give strategic direction.

**UN Bureau:** The Bureau takes care of the ongoing operations of the UN-CEBD.

### **4. Blue Flag Certification:**

Kerala's famed Kappad beach in Kozhikode and Chal beach in Kannur have been bestowed with the coveted Blue Flag certification by Denmark-based Foundation for Environmental Education (FEE). It is a globally recognized eco-label accorded by the Foundation for Environment Education in Denmark (FEE). The Blue Flag programme was started in France in 1985 and in areas out of Europe in 2001. It is one of the world's most recognised voluntary awards for beaches, marinas, and sustainable tourism boats. It promotes sustainable development in freshwater and

marine areas through four main criteria: water quality, environmental management, environmental education and safety. The mission of Blue Flag is to promote sustainability in the tourism sector, through environmental education, environmental protection and other sustainable development practices. The other Indian beaches in the blue list are **Shivrajpur-Gujarat, Ghoghla-Diu, Kasarkod and Padubidri-Karnataka, Kappad-Kerala, Rushikonda- Andhra Pradesh, Golden-Odisha, Radhanagar- Andaman and Nicobar, Kovalam in Tamil Nadu and Eden in Puducherry beaches, Minicoy Thundi Beach, Lakshadweep, Kadmat Beach, Lakshadweep.**

**5. INS Vaghsheer:** It is the **sixth submarine of the first batch of six Kalvari-class submarines for the Indian Navy.** It is named after the sand fish, a deadly deep-sea predator of the Indian Ocean. It was launched in April 2022 and underwent extensive trials, testing its endurance, stealth features, and combat efficiency.

**6. Silver Notice:** It is the latest addition to Interpol's suite of colour-coded alerts, designed to help countries track and retrieve criminally obtained assets. This notice allows participating nations to request information on assets linked to criminal activities such as **fraud, corruption, drug trafficking, and environmental crimes.** It aimed at **tracing assets laundered across international borders.** This initiative, **part of a pilot project involving 52 countries,** including India, was launched following a request from Italy to locate the assets of a senior mafia member. The **project will run until at least November 2025, with 500 notices available for distribution among the participating countries.**

#### 14 JANUARY

**1. Indravati National Park:** It is located in the **Bijapur district of Chhattisgarh.** It was established in **1981 and declared as a tiger reserve in 1983 under the Project Tiger of India.** The park derives its name from the Indravati River, which flows from east to west and forms the northern boundary of the reserve with Maharashtra. It mainly comprises undulating hilly terrain with altitudes ranging between 177 to 599 m above sea level. **Three major forest types are recognized in Indravati are Moist Mixed Deciduous Forest with Teak, Moist Mixed Deciduous Forest**

**without Teak, and Southern Dry Mixed Deciduous Forest.**

**2. Universal Account Number (UAN):** UAN is a number allotted to all salaried employees, who contribute a part of their income towards the Employee Provident Fund (EPF). It is a **12-digit number that each member of the EPF is allotted against his/her name.** It is generated and allotted by the **Employees' Provident Fund Organisation (EPFO) and authenticated by the Ministry of Labour and Employment, Government of India.** This number is the same throughout an employee's professional life. When an employee changes his job, his EPF account number and Member Identification Number (Member Id) change, but UAN remains the same. If a member has already been allotted a UAN, then s/he may provide the same to the new establishment/employer, which in turn will mark the new allotted Member Id to the UAN. **The UAN will act as an umbrella for the multiple Member Ids allotted to an individual by different establishments.** This will help the member to view details of all the Member Ids linked to it. It is **useful for EPFO to track multiple job switches of the employee.**

**3. Employee Provident Fund (EPF):** EPF is the fund established under the **Employees' Provident Funds and Miscellaneous Act, 1952.** It is administered by the Employees' Provident Fund Organization (EPFO). **Every establishment with 20 or more employees is covered, and some organisations that employ fewer than 20 people are also covered,** subject to certain constraints and exemptions. The **employee and employer each contribute 12% of the employee's basic salary and dearness allowance towards the EPF.** After the employee retires, they receive a lump sum that includes both their own and the employer's contributions, in addition to interest on both.

**4. Neduntheevu Island:** The **Neduntheevu, sometimes known as Neduntivu, is the largest island falling in the Palk Strait in the northern parts of Sri Lanka.** This is known as Delft Island also, as it was so called by the Dutch colonials. The island's area is 50 sq. km. Its length is 8 km, and its maximum width is about 6 km. It happens to be the biggest of the seven inhabitable islands in the region. A **unique feature of this island is that it is flat and oval-shaped, which is wind-swept at almost all times, which makes the**

place very soothing. There are no streams on the island. The major source of freshwater is surface water, which is collected in natural depressions and artificial ponds. On the island there are varied kinds of dry shrubs and semi-arid tropical plants. **This island also has tall palm trees, which add to the overall beachy feel of the island.** A Dutch fort made of dead coral chunks is also located on this island. It is home to a population of 4,800 Tamil people, living in compounds only in the northern half of the island.

### **5. Surface-Enhanced Raman Spectroscopy:**

Surface-enhanced Raman spectroscopy or surface-enhanced Raman scattering (SERS) is a **surface-sensitive technique that enhances Raman scattering by molecules adsorbed on rough metal surfaces.** It enhances the Raman scattering signals of molecules close to nanostructured metallic surfaces, typically gold or silver. It provides the same information that normal Raman spectroscopy does, but with a greatly enhanced signal.

**Applications:** It has become a powerful tool in chemical, material and life sciences, owing to its intrinsic features.

### **What is Raman spectroscopy?**

It is a **spectroscopic technique used in condensed matter physics and chemistry to study vibrational, rotational, and other low-frequency modes in a system.** It depends on the inelastic scattering, or Raman scattering of monochromatic light, usually from a laser in the visible, near-infrared or near-ultraviolet range of electromagnetic spectra. It was discovered by the **famous Indian physicist C V Raman in the year 1928.**

### **6. Pink fire retardant:**

Fire retardant is a mix of chemicals used to extinguish or slow down the spread of fires. There **are different types of fire retardant but to tackle wildfires in the US, authorities most commonly use Phos-Chek, a brand of fire retardant, which mostly contains an ammonium phosphate-based slurry.** It is made of salts such as ammonium polyphosphate, which does not evaporate easily like water and stays for longer. Colour is usually added to the fire retardant to ensure that firefighters can see it against the landscape. This helps them create fire lines around the fire retardant, potentially saving lives and property.

### **What are the concerns?**

Environmental experts have said that spraying fire retardant using planes is ineffective, expensive and a growing source of pollution for rivers and streams. **Phos-Chek "is laden with toxic metals, and estimates retardant use has released 850,000 pounds of these chemicals into the environment since 2009.** These toxic metals include chromium and cadmium which can **cause cancer, and kidney and liver diseases in humans** and these toxic metals can kill aquatic life.

### **7. About Harvest Festivals of India**

**Lohri:** Marks the end of the winter solstice and celebrates the **rabi crop harvest.** Celebrated in Punjab, Haryana, Himachal Pradesh, and Jammu & Kashmir by Hindus and Sikhs.

**Makar Sankranti:** Marks the **sun's northward journey (Uttarayan) and the end of winter.** Celebrated as a harvest festival across India. Known as **Poush Sankranti (Bengal), Sukarat (Central India), Makara Sankranti (South and West India).**

**Magh Bihu (Assam):** Marks the end of the harvest season and the transition to spring.

**Pongal (Tamil Nadu):** A four-day festival dedicated to the Sun God, marking Uttarayan and the harvest season. Includes cleaning (Bhogi), worship of **the Sun (Surya Pongal), honoring cows (Maattu Pongal), and social visits (Kanum Pongal).**

### **8. About Lal Bahadur Shastri**

**National Movement:** He joined the Indian National Congress and participated in various civil disobedience movements led by Mahatma Gandhi. His childhood name was Lal Bahadur Shrivastava. However, being against the prevailing caste system, he decided to drop his surname. The title 'Shastri' was given after he completed his graduation at Kashi Vidyapeeth, Varanasi in 1925. The **title 'Shastri' refers to a 'scholar' or a person, adept in the holy scriptures.** He became the **second Prime Minister of India in 1964.**

**Agricultural Reforms:** To boost India's food production, he **promoted the Green Revolution in India in 1965, which led to an increase in food grain production, especially in Punjab, Haryana and Uttar Pradesh.** His slogan **'Jai Jawan, Jai Kisan'** during the 1965 war boosted the morale of the soldiers as well as farmers amid food scarcity.

**Tashkent Declaration for fostering long-term peace between the neighbours was signed on January 10, 1966**, between Indian Prime Minister Lal Bahadur Shastri and Pakistan's General Ayub Khan, brokered by the Soviet Union.

### **9. India Joins UN Panel on Big Data**

India has been included in the UN Committee of Experts on Big Data and Data Science for Official Statistics (UN-CEBD).

#### **UN-CEBD**

It was **created in 2014 with Australia as the first Chair**. It consists of 31 member states and 16 international organizations. A plenary meeting is held annually, usually alongside the Conference on Big Data for Official Statistics, to review and discuss activities and initiatives.

### **10. About Pink fire retardant**

It is a **chemical mix designed to extinguish or slow the spread of fires by depriving flames of oxygen**. Pink Color enhances visibility, aiding firefighters in targeting areas effectively. **Phos-Chek is the most commonly used fire retardant in the U.S. for wildfires**. It is an ammonium phosphate-based slurry that coats vegetation, creating a barrier to prevent fire from spreading. Research indicates that **Phos-Chek contains toxic metals like chromium and cadmium**, which can harm both humans and aquatic life when they enter waterways.

#### **15 JANUARY**

### **1. Hollongapar Gibbon Wildlife Sanctuary:**

It is located in the **Jorhat district of Assam, India**. It is the only sanctuary in India named after a gibbon due to its distinction for containing the densest gibbon populations in Assam. It is **situated at an altitude between 100 and 120 m (330 and 390 ft)**, the **topography gently slopes downward from southeast to northwest**. The Bhogdoi River creates a waterlogged region dominated by semi-hydrophytic plants along the border of the sanctuary. It contains India's only gibbons—the hoolock gibbons, and Northeastern India's only nocturnal primate—the Bengal slow loris.

### **2. Small Language Models (SLMs):**

SLMs represent a **specialized subset within the broader domain of artificial intelligence, specifically**

**tailored for Natural Language Processing (NLP)**. They are AI models designed to process and generate human language. They are **called "small" because they have a relatively small number of parameters compared to large language models (LLMs) like GPT-3**. They are characterized by their compact architecture and less computational power. This makes them lighter, more efficient, and more convenient for apps that don't have a ton of computing power or memory. SLMs are engineered to efficiently perform specific language tasks, with a degree of efficiency and specificity that distinguishes them from their LLM counterparts. They are **specialized in specific tasks and built with curated, selective data sources**.

### **3. Diego Garcia:**

**It is a coral atoll, the largest and southernmost island of the Chagos Archipelago, in the central Indian Ocean**. It is part of the British Indian Ocean Territory (BIOT) and accounts for more than half the land area. Discovered by the Portuguese in the early 16th century, it was for most of its history a dependency of Mauritius. In 1965 it was separated from Mauritius as part of the newly created BIOT. In 1966, the UK leased Diego Garcia to the US to create an air and naval base. For constructing the defence installation, the inhabitants of the island were forcibly removed. **Diego Garcia is the United States' major geostrategic and logistics support base in the Indian Ocean**. A non-binding 2019 UN General Assembly vote demanded that Britain end its "colonial administration" of the Chagos Archipelago and that it be returned to Mauritius. Recently, **the UK government declared that the sovereignty of the Chagos Archipelago would be transferred to Mauritius, including Diego Garcia**.

### **4. Makaravilakku:**

It is a significant **annual festival celebrated at the Sabarimala Temple in Kerala**. It takes place on the day of Makara Sankranti. The **festival marks the culmination of the annual pilgrimage season to the temple**. On Makaravilakku day, the sacred Thiruvabharanam, the royal ornaments of Lord Ayyappa, are brought to the temple from the Pandalam Palace. The **highlight of the Makaravilakku festival is the sighting of a celestial light, known as the "Makarajyothi" or "Makaravilakku"**. According to popular belief, the **light is a divine manifestation of Lord Ayyappa himself**. It is said to appear on the

horizon of the Ponnambalamedu hill, located near the Sabarimala Temple. **The Makaravilakku festival extends beyond the actual day of Makara Sankranti.** The festival lasts for seven days and ends with the ritual known as 'Guruthi' an offering conducted to propitiate the gods and goddesses of wilderness. No one remains in the temple premises after the performance of Guruthi.

### **5. Bharat Cleantech Manufacturing Platform:**

Recently, the union Minister of Commerce & Industry unveiled the Bharat Cleantech Manufacturing Platform. It is an **initiative designed to enhance India's cleantech value chains in the solar, wind, hydrogen, and battery storage sectors.** It will provide an opportunity for the Indian firms to collaborate, to co-innovate and will help provide a platform for financing, to share ideas, technologies and resources. This will **help India become an attractive business case and a global leader in the sustainability and cleantech sector.**

### **6. India's Clean Energy targets:**

**Target:** 500 Gigawatt of clean energy sources by 2030 in the country.

India has been one of the best performing countries in terms of meeting the **Nationally Determined Contributions (NDCs) submitted in 2015 to the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement.** India has achieved the target of NDCs by installing 200 GW renewable energy by 2022, 8 years ahead of schedule. India has the largest interconnected grid in the world.

### **7. Ranthambhore Tiger Reserve:**

It is located at the junction (great boundary fault) of **Aravalis and Vindhyan ranges in Rajasthan.** It was once a royal hunting ground for the Maharajas of Jaipur. It is **one of the largest tiger reserves in northern India.** It is one of the best places in the country to monitor the tiger because of climatic and vegetational features.

**Rivers:** The Rivers Chambal in the South and the Banas River in the North bound the tiger reserve.

Other structure like **Ranthambore Fort, a World Heritage Site, is located within RTR.**

### **8. Nag Mk 2 Missile:**

It is an indigenously-developed third-generation Anti-Tank Fire-and-Forget Guided Missile.

**Features:**

- **Third-Generation Fire-and-Forget Technology:** Enables precision targeting with minimal operator intervention post-launch
- **Versatile Performance:** Capable of neutralising modern armoured vehicles equipped with explosive reactive armour (ERA)
- **Platform Compatibility:** Successfully integrated with NAMICA, enhancing battlefield mobility and deployment flexibility

### **9. About Makaravilakku festival**

It is an **annual festival held at the Sabarimala temple in Kerala, India, dedicated to Lord Ayyappa.** It coincides with Makara Sankranti, celebrated on January 14 this year. It marks the end of the two-month pilgrimage season (mid-November to Makara Sankranti).

**Religious Significance:** The festival symbolizes **Lord Ayyappa's manifestation and divine light (Makara Jyothi).** It represents faith, devotion, and the triumph of Lord Ayyappa over evil forces.

### **10. Sada on Konkan Region**

The **Konkan region, nestled between the Arabian Sea and the Western Ghats,** is renowned for its unique geographical features Sada.

**About**

Sada are **flat-topped lateritic plateaus formed by centuries of erosion.** Mostly barren, they flourish with endemic flora during monsoons. **Traditional rice and millet (Nanchani) are cultivated without chemicals.**

**Natural groundwater recharge system:** The porous lateritic soil retains rainwater, ensuring year-round freshwater availability.

**Ecological Significance:** These habitats support vulnerable species like the Indian flapshell turtle and wildlife such as leopards, jackals, and migratory birds.

**Threats:** Development projects, laterite mining, and land-use changes for orchards and residential areas threaten the Sada. Its **classification as 'wasteland' in the Wasteland Atlas further endangers this fragile ecosystem**

### **11. What are REITs?**

Real Estate Investment Trusts or REITs are **investment trusts (like mutual funds) that pool funds from**

investors to own and operate income-generating real estate properties. They pool funds from investors offering them a liquid way of entering the real estate market while helping them diversify their portfolio and earn regular income plus long-term capital appreciation.

### 12. What are InvITs?

Infrastructure Investment Trusts (InvITs) are investment vehicles that pool funds from investors to own and operate infrastructure assets like highways, pipelines, and power plants. They offer regular income through dividends and long-term capital appreciation while helping monetize assets and attract private investment in public infrastructure.

### 13. Municipal Bonds

Municipal Bonds are debt instruments issued by urban local bodies (ULBs) to finance infrastructure projects and civic amenities. They are typically tax-free. These bonds help municipalities raise funds for public projects while offering fixed returns to investors.

### 14. About Atomic Energy Commission

**Genesis:** Established in 1948 under the leadership of Dr. Homi J. Bhabha.

**Governing Body:** The AEC is the governing body of the Department of Atomic Energy (DAE). The DAE was created in 1954 to implement the AEC's policies.

#### **Key Functions:**

Formulate policies for nuclear energy development.  
Promote research and development in nuclear science.  
Regulate nuclear activities.

**Ensure safety and security of nuclear installations.**

Collaborate internationally on nuclear energy.

**Leadership: The Prime Minister of India is the ex-officio Chairman of the AEC.**

### 15. 7.93% Drop in GHG Emissions

India's 4th Biennial Update Report (BUR-4) highlighted a 7.93% reduction in GHG emissions in 2020 compared to 2019.

About

**India submits Biennial Update Reports (BURs) to the UNFCCC every two years to track progress.** These reports update the national GHG inventories, detail mitigation actions, and highlight the support received, including efforts to reduce emissions. **India's historical**

share of cumulative global GHG emissions is 4% annually, despite having around 17% of the world's population between 1850 and 2019. India's annual primary energy consumption per capita in 2019 was 28.7 gigajoules (GJ), considerably lower than both developed and developing countries.

### 16. India's Nationally Determined Contribution (NDCs) Goals

**India seeks to achieve following targets by 2030:**

**Emission Reduction:** India aims to reduce the emissions intensity of its GDP by 45% by 2030, compared to 2005 levels.

**Renewable Energy:** The country seeks to achieve 50% of its energy needs from non-fossil fuel sources by 2030, with a target of installing 500 GW of renewable energy capacity.

**Carbon Sink:** India plans to create an additional carbon sink of 2.5 to 3 billion tonnes of CO<sub>2</sub> equivalent through afforestation and reforestation efforts.

India pledged to achieve net-zero emissions by 2070 at the 26th Conference of the Parties (COP 26) in 2021.

### 17. Diego Garcia

It is the largest and southernmost island of the Chagos Archipelago, located in the central Indian Ocean. It consists of a V-shaped cay. It was discovered by the Portuguese in the early 16th century. It is part of the British Indian Ocean Territory.

## **16 JANUARY**

### 1. Purulia Observatory:

**It is located on the Panchet Hill, Purulia District, West Bengal.** It is equipped with a 14-inch diameter telescope for scientific observations. The **observatory is at a height of 600 meters above ground level and at longitude of approximately 86° E.** It will be a major observatory not only in eastern India, but also in the world. There are very few observatories along the 86° East longitude, which stretches from the Arctic Ocean to Antarctica. This new observatory will help fill this gap. It will help in **scientific observations of astronomical objects, training students in handling telescopes and recording data.**

**Other Observatories in India:** ARIES Observatory, Nainital, (Uttarakhand), Vainu Bappu Observatory, Kavalur (Tamil Nadu) and Indian Astronomical Observatory (IAO), Hanle, Ladakh etc.

## **2. Sada:**

It is a **flat top formed as a result of centuries of erosion, locally called sada**, meaning a large flat area. It is located in the **Konkan region of Maharashtra**. They are **similar to the plateaux**, locally called pathar, in the Satara district of Maharashtra, Kaas Plateau is a well-known example.

### **Characteristics**

The **sada are barren most of the year but become transformed during the monsoons**. They are rocky and harbour unique endemic flora that cover it in the monsoon season. As it consists of highly weathered lateritic soil layer on the top which acts as a catchment for the rainwater and recharges the groundwater.

**Biodiversity:** This landscape consists of 459 plant species, of which 105 are endemic to the Konkan region. It also recorded 31 species of reptiles, 13 species of amphibians, 169 species of birds, and 41 species of mammals in the region. The **area is also host to works of art called geoglyphs, dated to roughly 10,000 years ago**.

## **3. National Turmeric Board:**

It will provide leadership on turmeric related matters, augment the efforts, and facilitate greater coordination with Spices Board and other Government agencies in development and growth of the turmeric sector.

### **Composition of Board:**

- **A Chairperson to be appointed by the Central Government.**
- A Secretary to be appointed by the Department of Commerce.
- Members from the **Ministry of AYUSH, Departments of Pharmaceuticals, Agriculture & Farmers Welfare, Commerce & Industry of the Union Government.**
- Representatives from the top two turmeric growing states of **Maharashtra and Telangana and from the state of Meghalaya.**
- States will be represented on the Board by rotation.
- Select national/state institutions involved in research, representatives of turmeric farmers and exporters.

**Mandate:** The Board will focus on key areas such as **research and development, value addition to turmeric**

**products, and promoting awareness of the spice's medicinal and essential properties.** It will also work on improving turmeric yield, enhancing logistics and supply chains, and exploring new international markets for turmeric. Ensuring quality and safety standards for turmeric production and exports will also be a critical aspect of the Board's mandate.

**Headquarter: Nizamabad, Telangana**

## **4. Status of Turmeric in India:**

**Turmeric is often referred to as the "Golden Spice,"** holds immense economic potential for Indian farmers. India is responsible for over 70% of the world's turmeric production, with 30 varieties of turmeric being grown in the country. The largest producing states of Turmeric are **Maharashtra, Telangana, Karnataka and Tamil Nadu**. The leading export markets for Indian Turmeric are **Bangladesh, UAE, USA and Malaysia**

## **5. Falcated duck:**

It is also known as **falcated teal (Mareca falcata) is a gadwall-sized dabbling duck**. It is from eastern Siberia and Mongolia to northern Japan with wintering grounds in southeast Asia to eastern India. There have also been sightings of **falcated teals in America, Poland and Thailand**. They are normally found in freshwater lakes, ponds, rivers and marshes that are surrounded by forest. The breeding season of this species is from May to early July. They make their nests on the ground near water, usually in tall grass or brush. They are **mostly herbivorous, and eat vegetable matter, seeds, rice and aquatic plants**. Occasionally they also consume small invertebrates and soft-shelled mollusks. The sightings of the Falcated Ducks in India are irregular and can be termed as 'rare'. **A primary threat to the falcated duck is hunting, as people want them for food and their feathers.**

**Conservation Status:**

**IUCN: Near Threatened**

## **6. Telecom Technology Development Fund:**

It has been setup under **Universal Services Obligation Fund (USOF) of Department of Telecom (DOT), Government of India**. **USOF is now called Digital Bharat Nidhi**. It aims to promote the ecosystem for research, design, prototyping, proof of concept testing, IPR creation, field testing, security, certification and



manufacturing of products etc. in telecommunication field.

**Aims:** To fund R&D in rural-specific communication technology applications and form synergies among academia, start-ups, research institutes, and the industry to build and develop the telecom ecosystem.

To promote technology ownership and indigenous manufacturing, create a culture of technology co-innovation, reduce imports, boost export opportunities and creation of Intellectual Property.

**The following Indian entities are only eligible for support from this fund:**

- Domestic Company(ies) with focus on telecom R&D, Use case development
- Startups / MSMEs, Academic institutions
- R&D institutions, Section 8 companies / Societies, Central & State government entities / PSUs /Autonomous Bodies/SPVs / Limited liability partnerships- with a focus on telecom research and development.

### 7. Kerch Strait

**Location:** It is a strait in Eastern Europe connecting the Sea of Azov with the Black Sea. It is located between the Kerch Peninsula in Crimea (annexed by Russia in 2014) and the Taman Peninsula in Russia. It gets its name from the Crimean city of Kerch, formerly known as the Cimmerian Bosphorus.

**Kerch Strait Bridge:** A significant feature of the Kerch Strait is the Kerch Strait Bridge, which connects the Crimean Peninsula to mainland Russia.

### 8. Autism Spectrum Disorder (ASD)

**About:** It is a neurological and developmental condition affecting communication, behavior, interaction, and learning due to disruptions in brain signaling.

**Causes:** Likely due to genetic and environmental factors, including maternal health and birth complications.

**Genetic disorders (e.g., Fragile X syndrome)** and environmental triggers (e.g., air pollution) may increase risk.

**Prevalence:** The World Health Organization estimates global prevalence at 1%, up from 0.62% in 2012.

### 9. Credit-Deposit Ratio

Banks in India added more deposits than loans last year, leading to a softening of the credit-deposit ratio.

### **About**

**CD ratio or the loan-to-deposit ratio is used to assess a bank's liquidity by comparing its total loans to total deposit for the same period.** Typically, the ideal loan-to-deposit ratio is 80% to 90%. A loan-to-deposit ratio of 100% means a bank loaned one dollar to customers for every dollar received in deposits it received.

**High CDR:** Indicates that the bank is actively lending, which could lead to higher profitability but also higher risk if loan repayments are not met. If the ratio is too high, the lender does not have enough liquidity for unanticipated stress or sudden withdrawals of funds.

**Low CDR:** Suggests that the bank is more conservative, lending less and holding more reserves, which reflect caution or an inability to find suitable lending opportunities.

### 10. About Army Day

It is celebrated on **January 15** each year to honor **General (later Field Marshal) KM Cariappa, the first Commander-in-Chief of the Indian Army.** On this day in 1949, Gen Cariappa took over the command of the Indian Army from General Sir FRR Bucher, the last British Commander-in-Chief, marking the transition to an independent Indian Army. **Gen Cariappa is also known for leading Indian forces to victory in the India-Pakistan 1947 war.**

### 11. Green Energy Open Access Rules, 2022

#### **Salient Features of GEOA Rules, 2022**

These rules are notified for **promoting generation, purchase and consumption of green energy including the energy from Waste-to-Energy plants.** The Green Open Access is allowed to any consumer and the limit of Open Access Transaction has been reduced from 1 MW to 100 kW for green energy, to enable small consumers also to purchase renewable power through open access. Consumers are entitled to demand supply of Green Power from Discoms. Discoms would be obligated to procure and supply green power to eligible consumers. Commercial and Industrial consumers are allowed to purchase green power on a voluntary basis. There shall be a uniform Renewable Purchase Obligation (RPO), on all obligated entities in the area of a distribution license. **Green Hydrogen/Green Ammonia has also been included for fulfillment of its RPO.**

**17 JANUARY****1. Central Suspect Registry:**

It is an initiative to strengthen cyberfraud risk management by creating a registry of identifiers. It was **created based on the National Cybercrime Reporting Portal (NCRP)**. It contains data of 1.4 million cybercriminals linked to financial fraud and various cyber-crimes. It has been **developed by the Indian Cyber Crime Coordination Centre (I4C)**, and can be **accessed by states and UTs as well as central investigation and intelligence agencies**. The registry was developed with collaboration from the banks/financial institutions and using it as a central-level database with consolidated data on cybercrime suspects.

**What is Indian Cyber Crime Coordination Centre (I4C)?**

It has been **established under the Ministry of Home Affairs (MHA) to deal with cybercrime in the country in a coordinated and comprehensive manner**. It focuses on tackling issues related to cybercrime for citizens, including improving coordination between various LEAs and stakeholders.

The **centre is located in New Delhi**.

**Functions:**

It **acts as a nodal point in the fight against cybercrime**. It identifies the research problems and needs of LEAs and take up R&D activities in developing new technologies and forensic tools in collaboration with academia / research institutes within India and abroad. It prevents misuse of cyberspace for furthering the cause of extremist and terrorist groups.

**2. Electrokinetic Mining:**

It is a novel mining technique which uses **Electrokinetic i.e the application of a direct or alternating electric field to accelerate the migration of movable species, such as metals, water, and particles**.

**Issue with present technique:** Currently, heavy rare earth elements (HREE) are dominantly mined from ion-adsorption rare earth deposits (IADs) discovered in South China, and the regional mining produces and supports 95% of the global demand of HREEs. However, the conventional mining applies excessive usage of ammonium-salt-based leaching agents to recover HREEs from IADs, such technique exhibits low efficiency and devastating environmental impact on the local eco-system.

**Advantages of Electrokinetic Mining:** It **reduces leaching agent usage by 80%, and energy consumption by 60%**.

**High recovery rate:** Its recovery rate exceeds 95% which marks a breakthrough in sustainable mining. It can simultaneously help reduce the environmental impacts and improve the recovery rate of REEs.

**3. Sydney Funnel-Web Spider:**

It is a shiny, dark brown to black spiders with finger-like spinnerets (silk-spinning organs) at the end of their abdomen. Its venom glands are a lot larger and its fangs are a lot longer. **Only the male Sydney funnel-web, which carries a much stronger venom, is responsible for human deaths.**

**Habitat:** They are found in bushy suburban areas, open and closed sclerophyll forests and woodlands, often on south or east-facing slopes or in shady gullies.

**About funnel-web spiders:**

These **are one of the most dangerous arachnids in the world**. There are 36 described species of Australian funnel-web spiders and they are currently placed in three genera: **Hadronyche, Atrax and Illawarra**. Their venoms are filled with 40 different toxic proteins.

**4. Atomic Energy Commission (AEC):**

It is the **governing body of the Department of Atomic Energy (DAE), Government of India**. The **Department of Atomic Energy (DAE) was set up on August 3, 1954**, under the direct charge of the Prime Minister through a Presidential Order. As per this order, all businesses of the Government of India related to atomic energy and to the functions of the Central Government under the Atomic Energy Act, 1948, were directed to be transacted in the DAE. **Subsequently, in accordance with a government resolution dated March 1, 1958, the Atomic Energy Commission (AEC) was established**

in the DAE. The AEC is responsible for formulating the policy of the DAE. **The secretary to the government of India in the DAE is ex-officio chairman of the AEC.** The other members of the AEC are appointed for each calendar year on the recommendation of the AEC chairman and after approval by the Prime Minister.

**Headquarters: Mumbai, Maharashtra**

### 5. Kokborok Language:

**Kokborok is a language of the Borok people, geographically known as Tripuris.** It is one of the **State's official languages of Tripura, notified on January 19, 1979.** According to the 2011 Census report, the number of Kokborok-speaking people is 8,80,537, which is 23.97% of the total population of Tripura

### 6. Kashi Tamil Sangamam

The Union Minister for Education launched the registration portal for the 3rd edition of Kashi Tamil Sangamam (KTS).

#### **About**

It will commence on **15th February 2025 in Varanasi, Uttar Pradesh.**

**Organized by:** Ministry of Education.

**Launched in:** 2022.

**Universities:** IIT Madras and Banaras Hindu University (BHU).

**Aim: To rediscover, reaffirm, and celebrate the age-old links between Tamil Nadu and Kashi.**

It is in sync with NEP 2020's emphasis on integrating the Indian Knowledge Systems with modern systems of knowledge. It provides an opportunity for scholars, students, philosophers, and artists from the two regions to share their knowledge. It also aims to make the youth aware and experience cultural oneness **Both Kashi and Chennai have been recognised by UNESCO as 'Creative Cities of Music'.**

### 7. Tharu community

The Tharu community is an indigenous ethnic group primarily residing in the **Terai region of Nepal and the adjoining areas of Uttar Pradesh, Bihar, and Uttarakhand in India.** They speak a language called **Tharu or Tharuhati, which is part of the Indo-Aryan language group.** The Tharu tribe was recognized as a Scheduled Tribe by the Government of India in 1967.

### 8. About Siachen Glacier

The Siachen Glacier is a **Piedmont glacier, which spreads out on a plain at the base of mountains.** It is the world's second-longest non-polar glacier after the Fedchenko Glacier in Tajikistan. **It is located in the Karakoram Range, between the Salto Ridge to the west and the main Karakoram Range to the east.** The glacier originates near Indira Col West, marking the boundary between Central Asia and the Indian subcontinent. **The glacier feeds the Nubra River, which is a tributary of the Shyok River.** The Shyok River is part of the larger Indus River system. India took control of the glacier under Operation Meghdoot (1984), preempting Pakistan's plans to occupy it.

### 9. Blood Money

The death sentence awarded by a Yemen court to an Indian-origin nurse has brought the focus back on 'blood money'.

#### **About**

**Blood money', or 'diyya', finds footing in the Islamic Sharia law, and is followed in countries that incorporate these laws.**

**Provision: A select quantity of a valuable asset, primarily monetary, has to be paid by the perpetrator of the crime to the victim, or the victim's family if the latter has died.** It is practised in cases involving unintentional murder and culpable homicide. It is done to avoid harsh punishments like death sentences and to provide monetary compensation to the victim's family in exchange for mercy. This system leaves the offender's fate in the hands of the family of the victim.

**India: Concept of Blood money is not found in India's formal legal system.** However, the system does provide a way for the accused to negotiate with the prosecution through 'plea bargaining'

### 10. Objectives of Kampala Declaration

- Intensifying sustainable **food production, agro-industrialization, and trade,**
- Boosting Investment and Financing for Accelerated Agrifood Systems Transformation,
- Ensuring **Food and Nutrition Security,**
- Advancing **Inclusivity and Equitable Livelihoods,**
- Building **Resilient Agrifood Systems,**
- Strengthening **Agrifood Systems Governance.**

### 11. Malabo Declaration

In 2003, during the **Second Ordinary Session of the African Union Assembly in Maputo, Mozambique, the Maputo Declaration on Agriculture and Food Security in Africa was adopted**. This Declaration marked the official launch of the Comprehensive Africa Agriculture Development Programme (or CAADP).

### **12. About naval platforms**

**INS Nilgiri is the lead ship of the Project 17A frigates and It honors the maritime history of the Chola dynasty**. It is a next-generation stealth frigate designed by the Indian Navy's Warship Design Bureau. **INS Vaghsheer is the sixth and final submarine of the P75 Scorpene Project**. It is dedicated to India's naval legacy and It is constructed in collaboration with France's Naval Group. **INS Surat is the fourth and final ship of the Project** and It reflects Gujarat's historical maritime ties with West Asia. A state-of-the-art destroyer with 75% indigenous content.

### **13. Similipal National Park**

Similipal is **one of India's largest biospheres, designated as a tiger reserve under Project Tiger (1973)**. Recognized as a Biosphere Reserve by the Indian government in June 1994. Named after the **Simul tree (silk cotton), abundant in the region**. **Added to UNESCO's Biosphere Reserve list in May 2009**. Similipal has the world's highest rate of black tiger sightings, making it a significant habitat for this rare variant

### **14. About Bharat Ranbhoomi Darshan**

The Bharat Ranbhoomi Darshan website will feature details on various battlefields like **Galwan (2020), Doklam (2017), and 75 other sites across India's borders), offering virtual tours, historical narratives, and interactive content**. The sites will also be highlighted by the Tourism Ministry as part of the Incredible India campaign.

## **20 JANUARY**

### **1. Dark Oxygen:**

It is the oxygen that is **being produced thousands of feet below the ocean, without any light or photosynthesis**. Until now, it was thought that oxygen was created only through photosynthesis, a process that requires sunlight. **Oceanic plankton, drifting plants, algae, and some bacteria are the primary elements attributed to the production of oxygen in**

**the ocean**. All these organisms are capable of photosynthesis. However, in this case, oxygen is not being produced by plants. It comes out of **polymetallic nodules that are similar in resemblance to lumps of coal**. These nodules, made up of metals like **manganese, iron, cobalt, nickel, copper, and lithium, can generate oxygen through electrochemical activity even in the absence of light**. They split water molecules into hydrogen and oxygen.

### **2. Trajan Gun:**

It is a 155 mm towed artillery gun system, jointly developed by **India (Larsen & Toubro) and France (KNDS)**. Several of this 52-calibre towed gun system are indigenously developed like the auxiliary power unit, control panel, and rolling gear assembly. It is **designed to meet the demands of modern combat, with a range of over 40 kilometers depending on the type of ammunition used**. The Trajan's modular design makes it **easy to transport and deploy, while its automated loading system ensures rapid firing rates**. It is also capable of operating in diverse terrains, from marshy lowlands to high-altitude cold deserts. The system features advanced targeting and fire-control systems, which integrate seamlessly with modern military networks.

### **3. Planet Parade:**



It refers to a situation when **several planets in our solar system are visible in the night sky, at the same time**. This planetary meet-up, also known as a **conjunction**, makes the two planets appear close together or even **touch in the Earth's night sky**. This phenomenon is more an illusion of perspective rather than the planets being in a perfect line in space. Planets have different motions in the sky. They move at different rates compared to the other stars. Not all of them are visible in the sky everyday, but sometimes a position comes about so that many or all the planets are visible at the

same time, or within a few hours of each other. **According to NASA, such events, especially those involving four or more planets, are noteworthy and do not occur annually.**

#### **4. Indian Sustainable Natural Rubber (iSNR) Platform**

Recently, the Rubber Board has rolled two new initiatives called **iSNR (Indian Sustainable Natural Rubber) and INR Konnect**. It streamlines the compliance process, making it more efficient for stakeholders involved in the rubber supply chain targeting EU markets. It is **designed to facilitate compliance with the European Union Deforestation Regulation (EUDR) for Indian rubber ecosystem** It issues a traceability certificate which will verify the origin of rubber products and confirm its compliance with the EUDR.

#### **What is INR Konnect?**

It is a web-based platform which been designed to **connect growers of untapped rubber holdings with interested adopters to maximise plantation productivity**. The Board will certify the credibility of all participating parties while also impart training to those enlisted in production management, and sustainable practices on a need basis. The platform will also offer a comprehensive database of certified tappers.

#### **5. Exercise LA PEROUSE**

The indigenously designed and built guided missile destroyer **INS Mumbai is participating in the Exercise LA PEROUSE**. It is a multilateral maritime exercise that takes place in the Indian Ocean Region. It is **conducted by French Navy and held biennially**. It is the fourth edition of the multinational exercise.

#### **21 JANUARY**

##### **1. Krishna River:**

In terms of water inflows and river basins, **Krishna is the fourth largest river after Ganga, Godavari, and Brahmaputra**. It rises in **western Maharashtra in the Western Ghats range near Mahabaleshwar**, about 64 km from the Arabian Sea. It passes through **Maharashtra, Karnataka, Telangana, and Andhra Pradesh** and meets the Bay of Bengal at **Hamaladevi** in Andhra Pradesh, on the east coast.

**Total Length: 1300 km**

The Krishna River Basin extends over an area of about 258,948 sq. km, which is nearly 8 percent of the total geographical area of the country. It is **bounded by the Balaghat range on the north, by the Eastern Ghats on the south and the east, and by the Western Ghats on the west**. Its principal tributaries joining from the right are the **Ghatprabha, the Malprabha, and the Tungabhadra**, whereas those joining from the left are the **Bhima, the Musi, and the Munneru**.

##### **2. Lake Naivasha**

Kenya's popular Lake Naivasha is getting impacted by the water hyacinth that has taken over large parts of it. It is a **shallow freshwater lake located in the southern Rift Valley in Kenya**. It is considered to be of recent geological origin and is ringed by extinct or dormant volcanoes.

#### **What is Water hyacinth?**

The water hyacinth is **native to South America and was reportedly introduced to Kenya in the 1980s**. It is known to thrive in the presence of contaminants and grows quickly, and is considered one of the most invasive plant species in the world. It can **prevent the penetration of sunlight and impact airflow, affecting the quality of aquatic life**.

##### **3. National Disaster Response Force:**

It was **established under Section 44 of the Disaster Management Act, 2005**. It is aimed at specialized response to natural and man-made disasters. It is a multi-skilled and highly specialist force capable of dealing with all types of natural and man-made disasters like **Floods, Cyclone, Earthquakes, Landslides, Building-collapse, Trains and road accidents etc**. The strategic deployment of NDRF resources, characterized by **"proactive availability" and "pre-positioning"** during imminent disaster situations, has proven instrumental in mitigating damages caused by natural calamities across the country. The NDRF teams responded during triple disaster (Earthquake, Tsunami and Radiation Leakage) of Fukushima, Japan in 2011 and during Earthquake in Nepal in 2015. It functions under the **purview of the Ministry of Home Affairs (MHA) and is headed by a Director General**.

##### **4. World Economic Forum:**

It was established in 1971 as a not-for-profit foundation by German engineer and economist Klaus Schwab. It has introduced the concept of stakeholder capitalism. It engages organizations and leaders through dialogue, debate and commitments for action in the service of building more future-ready, resilient, inclusive and sustainable economies and societies. It was originally known as the European Management Forum. The WEF is largely funded by its partnering corporations. These are generally global enterprises with annual turnover greater than \$5 billion.

**Reports published by the World Economic Forum: Global Competitiveness Report, Global Information Technology Report, Global Gender Gap Report, Global Risks Report, Global Travel and Tourism Report, Global Enabling Trade Report.**

It has headquarters in Geneva, Switzerland and offices in New York and San Francisco in the United States, in Beijing, China and in Tokyo, Japan.

### **5. Great Barrier Reef:**



It is a complex of coral reefs, shoals, and islets in the Pacific Ocean off the northeastern coast of Australia in the Coral Sea. It is the longest and largest reef complex in the world and is the largest living structure on Earth. It makes up about 10 percent of the world's coral reef ecosystems. It also holds great scientific interest as the habitat of species such as the dugong ('sea cow') and the large green turtle, which are threatened with extinction. Much of the Great Barrier Reef is a marine protected area, managed by the Great Barrier Reef Marine Park Authority of Australia.

**UNESCO declared the Great Barrier Reef a World Heritage Site in 1981.**

### **6. Kalaripayattu**

It is an ancient martial art originating from Kerala, India, but practiced worldwide. The term "Kalari" in Malayalam refers to a traditional gymnasium where this martial art, known as Payattu, is taught.

**Mythological Belief: Some believe Kalaripayattu was introduced by Lord Parasurama, the sixth incarnation of Lord Vishnu, after reclaiming Kerala from the sea.** However, historians date its origin between 200 BCE and 600 CE, with its peak popularity between the 14th and 16th centuries.

### **7. About BRICS**

**Definition:** BRICS is an intergovernmental informal grouping of emerging economies aimed at fostering cooperation and enhancing their global influence.

**Members:** Brazil, Russia, India, China (these are founding members); South Africa joined in 2010; Iran, UAE, Egypt, Ethiopia, Saudi Arabia joined in 2024, Indonesia joined in 2025.

Argentina was initially expected to join in 2024 but later opted out.

**Background: The first BRIC Summit was held in Russia in 2009.**

**Importance:** The BRICS grouping represents approximately 40% of the global population, making it one of the largest demographic blocs in the world. It also accounts for an estimated 37.3% of global GDP, highlighting its significant contribution to the global economy.

### **8. What is Securities Transaction Tax (STT)?**

STT is a type of tax that is charged on the purchase and sale of securities like stocks, mutual funds, and derivatives on recognized stock exchanges in India. It is a direct tax, meaning that it is levied directly on the transaction value of securities. The STT was introduced in India in 2004 to replace the earlier system of imposing a tax on securities transactions called the "stamp duty." The 2024 budget has increased the securities transaction tax (STT) on Futures & Options (F&O) of securities to 0.02 percent and 0.1 percent respectively.

### **9. About Nord Stream Pipeline**

**About:** The Nord Stream is a major subsea gas pipeline system spanning 1,200 km under the Baltic Sea, designed to transport natural gas from Russia to Europe.

**Key Features:** Gas originates from the Bovanenkovo oil and gas condensate deposit in Western Siberia, Russia.  
**Components: Nord Stream 1 completed in 2011** (Route from Vyborg in Leningrad Oblast, Russia, to Lubmin, Germany.)

**Nord Stream 2 completed in 2021** (Route from Ust-Luga in Leningrad Oblast, Russia, to Lubmin, Germany.)

**22 JANUARY**

### **1. Surgical Tele-Robotic System**

India's first indigenous surgical tele-robotic system, **SSI Mantra successfully conducted two complex heart surgeries with patient in Jaipur and the operating surgeon in Gurgaon.** SSI Mantra is a robotic system developed by medical technology company, SSI Ltd which is the first-of-its-kind system in India. It **has been approved by the Central Drugs Standard Control Organisation (CDSCO) in India under Class B and Class C surgical devices.** It facilitates complex surgery such as Totally Endoscopic Coronary Artery Bypass (TECAB).

**Advantages:** The advantages include **reduced time of operation, better precision, minimal operation trauma to the body in terms of incision, blood loss, recovery time and chances of infection.**

**Challenges:** **Latency time, ensuring good connectivity, anticipating** and being prepared for medical and technical problems are the challenges associated with the procedure. It involves higher costs – both capital as well as operating and these facilities are more available in metro and tier-1 cities.

### **2. Contract Farming:**

It is an **agreement between farmers (producers) and buyers in which both agree in advance on the terms and conditions for the production and marketing of farm products.** These conditions usually specify the price to be paid to the farmer, the quantity and quality of the product demanded by the buyer, and the date for delivery to buyers. In some cases the contract may also include more detailed information on how the production will be carried out or if inputs such as seeds, fertilizers and technical advice will be provided by the buyer.

**Advantages to farmers**

- **Financial support:** Easier access to inputs, services and credit.
- It will **help in improved production and management skills.**
- Secure market or access new markets.
- It helps in the **reduction of price-related risks.**
- It will **generate more stable income and helps in better planning.**

- Introduction of new technologies.

**Concerns of farmers**

**Flexibility issue:** Loss of flexibility to sell to alternative buyers when prices increase.

Possible delays in payments and late delivery of inputs. Risk of indebtedness from loans provided by the buyer.

**Impact on environment:** It creates environmental risks from growing only one type of crop.

Unequal bargaining power between farmers and buyers.

### **3. Kalaripayattu:**



It is one of the oldest and most scientific martial art forms in the world, aimed at mind and body coordination. It originated and is widely practiced in Kerala. **The term "Kalari" in Malayalam refers to a traditional gymnasium where this martial art, known as Payattu, is taught.** According to mythology, the warrior sage Parasurama is credited with establishing Kalarippayattu.

**The four stages of Kalaripayattu are:**

**Maippayattu:** It is the body conditioning phase where the person is schooled to prepare their body for a fight. **Only after qualifying this stage can the practitioner proceed to the next phase of training.**

**Kolthari:** In this stage, a **person is taught attack and self-defense with the help of wooden weapons such as short sticks, and long sticks.**

**Angathari:** Once the person overcomes the fear of fighting with wooden weapons, **sharp metal objects are introduced — in the third stage.**

**Verumkai:** This stage includes **research-based bare-hand fighting.** Students are taught body anatomy so that they know what points they can hit and what they cannot.

The main ethnic styles of Kalarippayattu found in the three regions of **northern Kerala (Malabar) are: Vattenthrippu Style, Arappukkai Style and Pillathangi Style.** It is believed that Kalarippayattu was introduced to China at the Shaolin Temple in the 5th century AD by Bodhidharma, who was originally from Thanjavore, a

cultural center that was part of Kerala but is now in Tamil Nadu.

#### **4. Australopithecus:**



Australopithecus, (genus *Australopithecus*) is a group of extinct primates known from a series of fossils found at numerous sites in eastern, north-central, and southern Africa. They are the **closest known relatives of our genus, Homo**.

**Features:** Members of this species had apelike face proportions (a flat nose, a strongly projecting lower jaw) and braincase (with a small brain, usually less than 500 cubic centimeters - about 1/3 the size of a modern human brain), and long, strong arms with curved fingers adapted for climbing trees. They also had small canine teeth like all other early humans, and a body that stood on two legs and regularly walked upright. Males were almost twice the size of females, a level of difference, or sexual dimorphism, greater than modern chimpanzees or humans but less than gorillas or orangutans. They had mainly a plant-based diet, including leaves, fruit, seeds, roots, nuts, and insects.

#### **5. National Board for Wildlife (NBWL):**



It is constituted by the **Central Government under Section 5A of the Wildlife (Protection) Act, 1972 (WLPA)**. The board was constituted through an amendment of the WLPA in 2002. It replaced **the Indian Board for Wildlife, which was formed in 1952**. NBWL is India's top-level advisory body to the government on matters pertaining to wildlife conservation, particularly within Protected Areas (PAs). It is responsible for **guiding the government's decisions on matters related to wildlife conservation and issuing approvals for projects in PAs**. The WLPA

mandates that, without the approval/recommendation of the NBWL, construction of tourist lodges, alteration of the boundaries of PAs, destruction or diversion of wildlife habitat, and de-notification of Tiger Reserves cannot be done. It is a **47-member committee, headed by the Prime Minister and the Minister of Environment, Forest, and Climate Change as vice chairperson**.

#### **6. Standing Committee of NBWL:**

It is an **independent body under NBWL**. It **comprises not more than 10 members of the NBWL**. The Minister of Environment, Forest, and Climate Change chairs the Standing Committee. The **Standing Committee is completely a project clearance body, while NBWL is a policy decision body** that advises and takes part in Central Government's policies related to wildlife protection.

#### **7. Major Contributions of Narayan Guru**

**Temple Entry Movement:** Narayana Guru spearheaded efforts to ensure temple access for marginalized communities. He **consecrated the Aruvippuram Shiva Temple in 1888**, challenging the orthodox norms that restricted temple entry based on caste.

**Promotion of Social Equality:** He actively fought against **untouchability, caste discrimination, and social evils**, institutionalizing reforms through the **SNDP Yogam (Sree Narayana Dharma Paripalana Yogam)**.

**Literary Contributions:** Texts like **Atmopadesa Satakam and Daiva Dasakam** reflect his philosophical insights and practical guidance for spiritual and ethical living.

#### **8. Chola Administration**

The empire was divided into **mandalams (provinces), valanadus (districts), and nadu (villages)**. The local self-government system in villages, known as the **ur, sabha, and nagaram**, was a hallmark of their administration.

#### **Contributions to Art and Architecture**

**Temple architecture:** The **Brihadeshwara Temple (Thanjavur)** is an architectural marvel built by **Rajaraja Chola I and is a UNESCO World Heritage Site**. The Gangaikonda Cholapuram Temple and the Airavatesvara Temple are other iconic examples.



**Bronze Sculpture:** The Cholas excelled in bronze casting, particularly the creation of Nataraja sculptures, which depict Lord Shiva as the cosmic dancer.

### 9. Ratnagiri Buddhist Excavation

#### **About Buddhist Excavation**

Ratnagiri is part of **Odisha's Diamond Triangle, along with Udaygiri and Lalitgiri, known for ancient Buddhist sites.** It was a major center of Buddhist learning, rivaling Nalanda, and hosted both **Mahayana and Vajrayana sects of Buddhism.**

**Discoveries:** The team has unearthed a colossal Buddha head, a massive palm, an ancient wall, and inscribed Buddhist relics, dating back to the 8th and 9th Century AD. The last excavations occurred between 1958 and 1961, revealing a brick stupa, monastic complexes, and numerous votive stupas. **Chinese monk Hiuen Tsang, who visited Odisha in the 7th Century, might have also visited the site.**

### 10. About Entity Locker

Entity Locker is a secure, **cloud-based digital platform** designed to **streamline the storage, sharing, and verification of business documents** for a wide range of organizations in India.

### 11. Vikas Engine

It is the **workhorse engine with a nominal thrust of 80 tonnes.** It is a key component powering the liquid stages of ISRO's launch vehicles, including the **second stages of PSLV & GSLV, liquid strap-ons of GSLV, and the core liquid stage of LVM3.** Liquid engines that can throttle thrust are crucial for enabling booster stage recovery in future launch vehicles. It is **developed by ISRO's Liquid Propulsion Systems Centre.**

**23 JANUARY**

### 1. Pralay Missile:



It is an indigenously developed short-range, quasi-ballistic surface-to-surface missile. It has **been developed by the Defence Research and Development Organisation (DRDO) based on the Prithvi Defence**

**Vehicle from the Indian Ballistic Missile Programme.** It has been developed for deployment along the Line of Actual Control (LAC) and Line of Control (LoC).

**Features:** It is powered by a solid-propellant rocket motor. The **missile has a range of 150-500 km and can be launched from a mobile launcher. It has a payload capacity of 500-1,000 kg.** The missile is capable of carrying conventional warheads. It is equipped with guidance systems that provide a Circular Error Probable (CEP) of less than 10 meters. The missile reaches terminal speeds of Mach 6.1 and can engage targets such as radar installations, command centers, and airstrips. It has the ability to change its path after covering a certain range mid-air.

### 2. Vaigai River:

**It is a 258 kilometres long river in Tamil Nadu.**

**Course:** It originates from the **Varusanadu and Megamalai hills of the Western Ghats.** It travels through the Pandya Nadu region of Tamil Nadu generally in the south-east direction and rarely causes floods. It drains into **the Palk Strait near the Pamban Bridge in Ramanathapuram district.** It drains an area of 7,741 sq. km, which entirely lies in Tamil Nadu. The river basin is flanked by the Western Ghats on the south and west, the southern slope of Palani hills (Kodaikanal hills), Sirumalai hills, Alagar hills etc. on the north, and the Bay of Bengal on the east. **Vaigai gets major feed from the Periyar Dam in Kerala.** Water from the Periyar River in Kerala is diverted into the Vaigai River in Tamil Nadu via a tunnel through the Western Ghats. Its main tributaries are **Suruliyaru, Mullaiyaru, Varaganadhi, Manjalaru, Kottagudi, Kridhumaal, and Upparu.** The river finds a mention in Sangam literature dated to 300 before Common Era.

### 3. Asan Conservation Reserve (ACR):



It is a **444-hectare stretch of the Asan River running down to its confluence with the Yamuna River in Dehradun district of Uttarakhand.** It was declared as a **Conservation Reserve in 2005 under Section 36A of the Wildlife (Protection) Act, 1972.** It was the **first Ramsar site in Uttarakhand.** It is also listed as an

Important Bird Area (BNHS and BirdLife International) and is popular for sightings of native and migratory birds.

Strategically located within the Central Asian Flyways (CAF), the reserve homes 330 species of birds, including critically endangered-white-rumped vulture, Baer's pochard; endangered-Egyptian vulture, steppe eagle, black-bellied tern; and vulnerable-marbled teal, common pochard, Indian spotted eagle, etc. **Other non-avian species present include 49 fish species, one of these being the endangered Putitor mahseer.**

#### **4. Mount McKinley**



Recently, the US President signed an executive order renaming Denali to Mount McKinley. It is the **highest peak in North America**. The upper half of the mountain is covered with permanent snowfields that feed many glaciers like **Kahiltna Glacier, the Muldrow Glacier, the Peters Glacier, the Ruth Glacier, and the Traleika Glacier**. It forms the central feature of the Denali National Park and Preserve.

#### **5. Scramjet Engine:**

It is an **upgraded version of the Ramjet and generates thrust through supersonic air flow and combustion**. It moves at hypersonic speed and performs best at high speeds, greater than Mach 5. Hypersonic missiles are a class of advanced weaponry that travel at speeds greater than Mach 5 i.e., five times the speed of sound or more than 5,400 km/hr. These advanced weapons have the potential to bypass existing Air Defence Systems and deliver rapid and high-impact strikes. **Several nations including USA, Russia, India and China are actively pursuing Hypersonic technology.**

**Developed by:** Defence Research & Development Laboratory (DRDL), a Hyderabad-based laboratory of Defence Research and Development Organisation (DRDO) has taken the initiative in developing a long-duration Supersonic Combustion Ramjet or Scramjet powered

**Hypersonic technology**

**Significance:** The successful ground test marks a crucial milestone in developing next-generation hypersonic missiles, faster civilian air transportation and facilities for putting satellites into orbit at a low cost.

#### **6. About Prime Minister's Internship Scheme**

It has been **announced in the Budget 2024-25**. It aims to **provide internship opportunities to one crore youth in top 500 companies over five years**. Interns will gain exposure to real-life business environments and employment opportunities.

**Features:** **Partner Companies can offer internships starting from October 2024**. Top 500 companies identified based on CSR expenditure. Participation is voluntary, with approval from the Ministry of Corporate Affairs for other companies to join. **Internship Duration is 12 months**, with at least half of the period in a real-world job environment.

**Eligibility Criteria: Age: Between 21 and 24 years.**

#### **7. Diamond Imprest Authorization (DIA) Scheme**

The Department of Commerce has introduced the Diamond Imprest Authorization (DIA) Scheme.

##### **About**

**Aim:** To enhance the global competitiveness of India's diamond sector.

##### **Key Features of the Scheme:**

**Duty-free imports:** Allows the duty-free import of Natural Cut and Polished Diamonds, of less than  $\frac{1}{4}$  Carat (25 Cents).

**Export obligation:** It mandates export obligation with a value addition of 10%.

**Eligibility:** All Diamond exporters holding Two Star Export House status and above and having US \$15 Million exports per year, are eligible for availing the benefit under this scheme

#### **8. Pinaka Rocket Systems**

The Indian Army has set a Rs 10,200 crore order for ammunition related to the Pinaka multi-launch artillery rocket system.

##### **About**

The **Pinaka MBRL system was developed by the Defence Research and Development Organisation (DRDO) of India**. The system is named after "**Pinaka**," a mythical weapon used by Lord Shiva. It has the capability to hit targets at 75 kilometers and beyond. The **Pinaka MBRL is capable of launching a salvo of 12**

rockets in 44 seconds, which makes it an effective weapon for quickly overwhelming enemy defenses. Armenia became the first export customer for the indigenously developed Pinaka with interest expressed by several countries in the system.

### **9. Jawaharlal Nehru Port**

It is situated in Mumbai, Maharashtra and is one of the premier container-handling ports in India. It was commissioned in 1989 and it is the country's first 100% Landlord Major Port. It is India's Best-performing port, accounting for around 50% of the total containerised cargo volume across the major ports of the country. It is ranked 26th among the top 100 container ports in the world and it is connected to over 200 ports globally. In 2024, JNPA achieved a record of 7.05 million TEUs, operating at over 90% capacity with an 11% year-on-year growth. It aims to become India's first port to handle 10 million TEUs (twenty-foot equivalent units) by 2027.

**24 JANUARY**

### **1. Chandra X-Ray Observatory:**



It is one of NASA's premier space telescopes specially designed to detect X-ray emission from very hot regions of the Universe such as exploded stars, clusters of galaxies, and matter around black holes. It was launched on July 23, 1999, aboard the Space Shuttle Columbia (STS-93). It is part of NASA's fleet of "Great Observatories" along with the Hubble Space Telescope, the Spitzer Space Telescope and the now deorbited Compton Gamma Ray Observatory. Because X-rays are absorbed by Earth's atmosphere, Chandra must orbit above it, up to an altitude of 139,000 km (86,500 mi) in space. It is the world's most powerful X-ray telescope. It has eight-times greater resolution and is able to detect sources more than 20-times fainter than any previous X-ray telescope. Chandra allows scientists from around the world to obtain X-ray images of exotic environments to help

understand the structure and evolution of the universe.

### **2. Sukanya Samridhi Yojana (SSY)**

It is a savings scheme launched back in 2015 as part of the Government initiative, Beti Bachao, Beti Padhao campaign.

#### **Eligibility:**

The applicant must be a citizen of India. The account can be opened by a parent or legal guardian of the girl child. The girl child must be below the age of 10 years. Only one account is allowed for a girl child. A family can open only 2 SSY scheme accounts. NRIs are not eligible to open these accounts.

#### **Key Features:**

**Minimum & Maximum Deposit:** Investment of minimum Rs. 250 and maximum Rs. 1.5 lakh in a financial year. Subsequent deposits in multiples of Rs. 100. No limit on the number of deposits either in a month or in a Financial Year.

**Tenure:** The maturity period of SSY is 21 years from the account opening. However, contributions have to be made for the first 15 years only. Thereafter, the SSY account will continue to earn interest until maturity. The SSY account will be mandatorily operated by the girl child after she attains the age of 18 years. Interest on SSA as announced by Govt. of India every quarter will be applicable and compounded annually.

**Partial withdrawal:** Withdrawal shall be allowed after the account holder attains the age of eighteen years or has passed the tenth standard, whichever is earlier. For higher education 50% of the balance at the end of the previous financial year can be withdrawn. For marriage of adult account holder, 100% withdrawals

**Premature Closure:** Allowed in the event of death of the depositor or in cases of extreme compassionate grounds such as medical support in life threatening diseases to be authorized by an order by the Central Government.

**Tax Benefits:** On investing in this scheme, tax exemption is also available under Section 80C of the Income Tax Act. The amount invested, interest earned and maturity amount is tax free.

### **3. Mannan Community:**



The Mannan is a **scheduled tribe (ST)** of Kerala. It is the **only adivasi tribal dynasty with a kingship currently existing in South India**. They follow a matrilineal system of descent, and their ruler, the Raja Mannan, is elected by community headmen from among those eligible by heredity. **Mannankoothu is a unique ritual art form performed by the Mannans**. The art form is staged mainly during worship, harvest times and weddings.

#### **4. Mount Ibu:**



It is an **active volcano located in Halmahera Island, Indonesia**. It is a **1,325-meter (4,347-foot) stratovolcano** with a truncated summit and a number of large nested summit craters. It has a history of frequent eruptions, with most activity involving lava flows, ash plumes, and pyroclastic activity.

#### **5. National Voters' Day:**



It has been **observed annually on January 25 since 2011 to commemorate the foundation day of the**

**Election Commission of India, i.e. on January 25, 1950**. It aims to underline the centrality of the voter and raise electoral awareness among citizens and inspire their active participation in the democratic process. **It also promotes the enrolment of new voters, particularly young individuals who have recently become eligible**. Across the country, new voters are honored and presented with their Elector Photo Identity Card (EPIC) during NVD ceremonies. **This Year's Theme "Nothing Like Voting, I Vote for Sure"** is a continuation of last year's theme emphasizing the importance of participation in the electoral process and encouraging voters to take pride in exercising their franchise.

#### **6. Forever Chemicals:**



**Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)** are **toxic, man-made, hazardous chemicals that have dangerous effects on environment and health** of all organisms including human beings. They are **called "forever chemicals" because of their tendency to stay in the environment virtually**. PFAs can migrate to the soil, water and air during their production and use. These are **listed in the Stockholm Convention**.

**Applications:** They are used in thousands of items, from cosmetics and non-stick pans to aircraft and wind turbines, due to their resistance to extreme temperatures and corrosion.

**Impacts of PFAS on human health:** A variety of health risks that are attributed to PFA exposure, including decreased fertility, developmental effects in children, interference with body hormones, increased cholesterol levels and increased risk of some cancers.

#### **7. About Mannan community**

It is mainly settled in the **buffer zone area of the Idukki Wildlife Sanctuary at Kozhimala**, the hub of the tribe with 48 settlements ruled by a king. **The king is an integral part of the traditional functions and festivities of the community**. He wears a turban or headgear and special dress on such occasions and will be assisted by two Ministers and soldiers during the functions. They maintain their unique customs, rituals, and a strong reverence for

their traditional kingship. To sustain themselves, they cultivate basic crops, collect forest produce, and engage in manual labor or cattle breeding. **Mannankoothu is a unique tribal art form performed by the Mannan community.** It narrates the story from the classic tamil poem **Chilapathikaaram**

### 8. Mount Everest

It is **located between Nepal and Tibet.** It is the highest mountain in the world at 8,849 m, and has many names. Tibetans call it '**Chomolungma**', which means '**Mother Goddess of the World**' and worship the mountain as such. **Nepalis call it 'Sagarmatha', meaning 'Goddess of the Sky.** Edmund Hillary and Tenzing Norgay became the first people to stand atop the mountain. **Bachendri Pal was the first Indian woman to climb Mount Everest.**

### 9. What is the Enemy Property?

Enemy Property refers to the assets, properties, or holdings in India that were owned by individuals or entities from countries that were declared as enemies of India during times of war. The legal framework governing such properties was established to prevent the transfer, use, or exploitation of these assets by hostile nations. Enemy properties in India primarily relate to **the Indo-Pak wars (1947, 1965, and 1971) and the Indo-China war (1962).**

#### **Enemy Property Act, 1968**

The Enemy Property Act, 1968, provides the **legal basis for the management and administration of enemy properties.** It declares that enemy properties are vested in the Custodian for management and cannot be reclaimed by the original owners or their successors unless approved by the Central Government.

### 10. Crosspathy

Cross pathy is a practice in which **homeopathic and ayurvedic drugs are prescribed along with allopathic medicines.** The recent directive ensures chemists accept allopathic prescriptions from these qualified homeopaths.

### 11. What is Stargate?

Stargate is a \$500 billion initiative designed to establish a comprehensive artificial intelligence (AI) infrastructure in the United States over the next four years. It is a **collaborative effort between OpenAI, SoftBank, and Oracle, with an initial \$100 billion**

**investment.** The project involves constructing massive data centers and campuses across the country to support the development and deployment of AI technologies at scale. **Stargate is envisioned as a critical step toward re-industrializing the United States and enhancing its technological capabilities.**

### **27 JANUARY**

#### 1. Rakhigarhi



A reservoir unearthed recently in **Haryana's Rakhigarhi is not just a marvel of Harappan engineering but also advances evolving research on the Saraswati River.** It lies in the Ghaggar-Hakra river plain. It is the largest Indus Valley site. It is also well-known as the site which has yielded the only DNA evidence from the Harappan era.

#### 2. Shompens



They are **one of the least studied Particularly Vulnerable Tribal Groups (PVTGs)** in India belonging to the dense tropical rainforest of the **Great Nicobar islands of Andaman & Nicobar Islands.** Shompens, unlike the other primitive tribes of the Andaman and Nicobar Islands, are not of Negrito but of **Mongoloid stock.** Most of them remain in the forest and have little or no contact with outsiders. They have nuclear families comprising husband, wife, and their unmarried children. **The Shompen worship the moon, known as Houou, as their goddess, whom they believe created the universe.**

#### 3. Deep Ocean Mission



Launched as a central sector scheme under the Ministry of Earth Sciences (MoES). It is a **mission-mode project to support the Blue Economy Initiatives of the Government of India**. The **Samudrayaan project under the Deep Ocean Mission is for the development of a manned submersible to carry three people to a depth of 6000 meters** in the ocean with a suite of scientific sensors for ocean exploration and observation. The vehicle is called **Matsya 6000**.

#### 4. Blue Carbon

Recent studies suggest that mangroves and coastal wetlands annually sequester carbon at a rate 10 times greater than mature tropical forests. **Blue Carbon is the carbon captured by the world's ocean and coastal ecosystems**. Coastal ecosystems such as **mangroves, tidal marshes and seagrass meadows** sequester and store more carbon per unit area than terrestrial forests

#### 5. Pangsau Pass



Recently, the **Pangsau Pass International Festival** was celebrated in Nampong, Arunachal Pradesh. Pangsau Pass is considered to be "Hell gate" or "Hell Pass" due to difficult terrains in the Patkai Mountain Range. The pass offers one of the easiest routes into Myanmar from the Assam plains. The famous lake called, the **Lake of No Return** in Myanmar side, can be viewed from Pangsau pass.

**28 JANUARY**

#### 1. Udanti Sitanadi Tiger Reserve:



It was established by joining the regions represented by Sitanadi and Udanti wildlife sanctuaries. **The Udanti and Sitanadi wildlife sanctuaries derive their names from the rivers Udanti and Sitanadi**, which flow through the respective sanctuaries. It is located in the **Gariaband district of Chhattisgarh**. The location of the reserve is strategic since it also connects with the Kanker and North Kondagaon forest divisions, forming a contiguous forest corridor to Indravati Tiger Reserve in the Bastar region.

#### 2. White-Naped Tit



Bird enthusiasts recently documented the white-naped tit in North Karnataka's Kappatagudda hills for the first time, identifying it by its call. It is a passerine bird in the tit family Paridae.

**Scientific Name: Machlolophus nuchalis**

It is **endemic to India**, found in two disjunct populations: in the **northwest (Gujarat, Haryana and Rajasthan)** and in the **south (Andhra Pradesh, Karnataka and Tamil Nadu)**.

**Habitat:** Dry thorn scrub forest

**Features:** It is the only pied (black-and-white) tit in India.

**IUCN Red List: Vulnerable**

#### 3. Advanced Towed Artillery Gun System (ATAGS):



It is a large calibre Gun system with the capability to program and fire future Long Range Guided Munitions (LRGM) to achieve precision and deep strike. This **gun has been developed indigenously by the Defence Research and Development Organisation (DRDO)** and the production partners of these ATAGS are two private sector companies—Bharat Forge and Tata Advanced Systems. It also has the shoot-and-scoot capability. It is also designed to operate in extreme temperatures.

#### **4. Paraquat:**



Also known as **paraquat dichloride** or **methyl viologen**, it is one **of the world's most-used herbicides**. It is primarily used to control the growth of weeds and desiccate crops like cotton before harvest. **The WHO classifies paraquat as Category 2 (moderately hazardous and moderately irritating) chemical**. Its sale is banned in over 70 countries, including China and the European Union, due to its potent toxicity. It is **widely used in the US and in India**.

#### **5. Inland Waterways Authority of India:**



It is a **statutory body established under the Inland Waterways Authority of India Act (IWAI), 1985**. The Authority primarily undertakes projects for development and maintenance of IWT infrastructure on national waterways through grant received from **Ministry of Ports, Shipping and Waterways**.

**Headquarter: Noida, Uttar Pradesh**

**Nodal Ministry: Ministry of Ports, Shipping and Waterways**

#### **6. About Etikoppaka Dolls**

**Origin:** They are handcrafted in the **Etikoppaka village of Andhra Pradesh, India**.

**Material:** These toys are primarily made from a **softwood called 'Ankudu Karra' (also known as Ivory Wood)**.

**Crafting Process:** The process involves meticulous carving, shaping, and painting.

**Decorations:** Natural dyes extracted from plants, seeds, and leaves are used to paint the toys, resulting in a unique and eco-friendly finish.

**Variety:** Etikoppaka toys encompass a wide range of creations, including **animals, birds, dolls, and decorative items**.

#### **7. What is Whip?**

A whip refers to an **order to members of a party in the House to abide by a certain direction of the party**. Political parties issue whips to their MPs to either vote for or against the bill, depending on their party line. Once the whip is issued, the MPs from each party will necessarily have to obey the whip or else risk losing their seat in Parliament. The **term is derived from the old British practice of "whipping in" lawmakers to follow the party line**. It is **not mentioned in the constitution but is considered a parliamentary convention**. Parties appoint a senior member from among their House contingents to issue whips — this member is called a chief whip, and he/ she is assisted by additional whips.

#### **Types of Whip**

**There are three kinds.**

A **one-line whip** just informs members about a **vote but permits them to abstain**.

A **two-line whip** asks them to be present but does not tell them how to vote.

The **three-line whip**, largely the norm these days, directs members to **be present and vote as per the party line**.

#### **8. About The Reserve Bank – Integrated Ombudsman Scheme, 2021**

It integrated three previous RBI Ombudsman schemes into one unified system. Three erstwhile Ombudsman Schemes were

**The Banking Ombudsman Scheme, 2006**

**The Ombudsman Scheme for Non-Banking Financial Companies, 2018, and  
The Ombudsman Scheme for Digital Transactions, 2019.**

This streamlined approach aims to resolve customer complaints against regulated entities (REs) regarding deficiencies in service.

**Coverage:** It covers all **commercial banks, Non-Banking Financial Companies (NBFCs), Payment System Participants, most Primary (Urban) Cooperative Banks, and Credit Information Companies.**

Additional entities like Non-Scheduled Primary (Urban) Co-operative Banks with deposits above ₹50 crore and Credit Information Companies are included.

**29 JANUARY****1. Chhatrapati Sambhaji Maharaj**

Chhatrapati Sambhaji Maharaj was the **eldest son of Chhatrapati Shivaji Maharaj**. He came to power following a bloody succession battle with his half-brother Rajaram in 1681. The **Mughal emperor Aurangzeb (1618-1707) was a contemporary** and his plan to extend his empire towards the Deccan often resulted in clashes with the Marathas.

**2. Victoria Lake**

It is the **world's largest tropical lake**. It's also the largest lake in Africa, and the **second-largest freshwater lake in the world by surface area** (after Lake Superior in North America). The lake was named in honour of Queen Victoria of England. It is located in **East Africa**, spanning towards the borders of three countries: Tanzania, Uganda, and Kenya.

**3. Unified Pension Scheme (UPS)**

The **UPS was recommended as an alternative to the NPS** by a panel led by former Finance Secretary T.V. Somanathan. The **Pension Fund Regulatory and Development Authority (PFRDA)** will determine the mechanism for retirees opting for the UPS, addressing top-up amounts relative to their NPS payouts. It will **offer employees an assured pension of 50% of their average basic pay over the last 12 months before retirement, for a minimum service of 25 years.**

**Additional Benefits:** The UPS includes a family pension of 60% of the government worker's pension upon their death, a lumpsum superannuation payout, and gratuity benefits. A minimum pension of ₹10,000/month is

promised for those with at least 10 years of Union government service.

**4. Piezoelectricity**

Piezoelectricity is the **generation of electrical charge in a solid material by an applied mechanical stress and vice versa**. The piezoelectric effect is exhibited in materials that develop a net electric dipole moment. In such materials, the dipole density or polarization changes in response to mechanical strain resulting in a net accumulation of charge.

**5. Baltic Sea:**

It is one of the seas of the **Atlantic Ocean, situated in Northern Europe. It is the youngest sea on the earth.**

**Surrounding Countries:** It has a coastline of approximately 8,000 km, shared by several countries, including **Sweden, Poland, Lithuania, Latvia, Finland, Estonia, Germany, Denmark and Russia**. It is often cited as the **world's largest brackish inland water body.**

**6. Nagoba Jatara**

**Nagoba Jatara, the eight-day holy pilgrimage event of Mesram clan Adivasi Gonds, is slated to start at Keslapur village in north Telangana's tribal heartland of Indervelli mandal in Adilabad district. It is the second biggest tribal festival in India, after the Sannakka Saralamma Jatara, held also in Telangana.** The chief deity at the festival is the 'Nagoba' (Sri Shek – Cobra). The **Gusadi Dance performance by dancers from the Gond tribe** is a major special attraction of the event.

**7. WASP-127b**





Scientists recently detected 'supersonic winds' travelling at a speed of 33,000 km per hour on a giant gaseous planet named WASP-127b. It is a **large gaseous exoplanet, located in our Milky Way galaxy.** It is a gas giant planet, which means that it has no rocky or solid surface beneath its atmospheric layers. Its **diameter is about 30% larger than Jupiter's, but its mass is only about 16% that of Jupiter's, making it one of the puffiest planets ever observed.**

### **8. Etikoppaka Toys**



Recently, Andhra Pradesh's eco-friendly wooden Etikoppaka Toys earn accolades at Republic Day parade. **The toys are renowned for their smooth contours and vibrant colours, coloured with natural dyes derived from seeds, lacquer, bark, roots and leaves. In 2017, the toys received the Geographical Indication (GI) tag, a hallmark of their authenticity and cultural significance.**

### **9. Fentanyl:**



It is a **potent synthetic opioid drug approved by the Food and Drug Administration for use as an analgesic (for pain relief) and anesthetic (for surgery).** It is approximately 100 times more potent than morphine and 50 times more potent than heroin as an analgesic. Its overdoses can cause stupor, changes in pupil size, clammy skin, **cyanosis (blue skin), coma and respiratory failure leading to death.**

**30 JANUARY**

### **1. Indian squid:**



Researchers at the **Central Marine Fisheries Research Institute, Kochi, claimed to have decoded the gene expression pattern of Indian squid (Uroteuthis duvaucelii).** Also known as the **Indian calamari,** it is a cephalopod species that is commonly found in the waters off the coasts in India. Squids are known for their advanced nervous system, exceptional problem-solving skills and complex behaviours like camouflage and jet propulsion. **They are known to occur in the Indo-Pacific region** including in Red Sea, Arabian Sea, South China Sea and the Philippine Sea, etc.

**IUCN: Least Concern**

### **2. Organophosphate:**



It is a **chemical that is used in pesticides and insecticides, and absorbed through inhalation and ingestion.** It is formed through the esterification process involving phosphoric acid and alcohol. It is **generally used to protect crops from pests and even to control the spread of disease by insects** and have extensive application in manufacturing plastics and solvents.

### **3. Lezim Dance**



It is a **folk dance from Maharashtra.** It gets its name after a musical instrument - a unique wooden stick, with jingling cymbals attached to it that the dancers carry while performing the dance. **The dance is**

accompanied by a dhol or dhalgi (small dhol). Lezim is a kind of musical instrument which was traditionally used in all folk dances but today it is primarily used in Ganesha procession. There are no winds or string instruments accompanying it, often there is no song accompaniment either, but sometimes, a song can be sung.

#### **4. 'When-listed' Platform**



The Securities and Exchange Board of India (Sebi) is looking to launch a 'when-listed' platform. It has **been launched for trading of shares of companies that have finished their Initial Public Offering (IPO) and are yet to be listed on stock exchanges.** It is aimed at reducing the activity in the grey market, which is unregulated and has a significant influence on listings.

**Present timeline of listing shares in India:** Once the IPO is closed, shares have to be listed on trading platforms in trading plus three working days (T+3), with T being the closing day of the offer. **The allotment of shares is done on T+1 day. In the period between the allotment of shares and listing day, investors trade in the grey market.**

#### **What is Grey Market?**

It refers to an **unofficial trading of securities even before they are listed on a stock exchange.** This is an unregulated market and works on demand and supply. Many investors look at the premium offered in the grey market for stock of a company which has launched an IPO, before considering investing in the offer.

#### **5. Harmful Algal Blooms (HABs):**



Algal blooms can happen in **fresh, marine (salt), and brackish (a mixture of fresh and salt) water.** Not all algal blooms are harmful. **Most blooms are beneficial because the tiny plants are food for animals in the ocean.** Blooms with the potential to harm aquatic ecosystems and human health are referred to as HABs. **Why do HABs occur?**

Certain environmental conditions, such as **warmer water temperatures in the summer and excessive nutrients from fertilizers or sewage waste brought by runoff, trigger HABs.** Many different types of algae can cause HABs. However, three types—**cyanobacteria, dinoflagellates and diatoms**—cause most blooms that make people and animals sick.

#### **What are impacts from HABs?**

HABs can produce toxins which can result in acute or chronic disease in most vertebrates, depending on the type of toxin and amount of toxin absorbed. **They can damage the environment by depleting the oxygen in the water, which can kill fish and other living creatures.** HABs that bloom near the water surface can also block sunlight from reaching organisms deeper in the water.

#### **6. About Bomb Cyclone**

It is a term used by meteorologists and it occurs **when a midlatitude (the latitudes between the tropics and polar regions) cyclone rapidly intensifies, or strengthens, over a 24 hour period.** This intensification is represented by a drop in millibars, a measurement of pressure used in meteorology. **This intensification happens when a cold air mass collides with a warm air mass, such as over warm ocean waters. It is also known as Bombogenesis** and it can cause hurricane-force winds, heavy precipitation, and dangerous conditions, primarily during winter.

#### **7. Fingerprint Use in Law Enforcement**

**Fingerprint Analysis Process:** Prints from the crime scene are compared to suspect records.

**Key Uses:** Identifying prior criminal records of arrested individuals.

**Matching crime scene prints with suspects.**

**Legal Framework:**

**Criminal Procedure (Identification) Act, 2022:** Allows storage of fingerprints for individuals arrested for serious crimes.

**Matching Process:** Digital Analysis or Expert Verification.

**Henry Classification System:** Used by the CID for fingerprint matching. A 10-point match is considered conclusive evidence.

### 8. About DeepSeek

DeepSeek is the name of a free AI-powered chatbot, developed by the Chinese AI company founded by entrepreneur Liang Wenfeng.

#### **How is it Different?**

It was **built at a fraction of the cost of industry-leading models like OpenAI** – because it uses fewer advanced chips. Its base model DeepSeek-R1 appears to have been trained via accurate sources while introducing a layer of censorship. It **surpasses models developed by tech giants Google, Meta, and Anthropic in terms of overall quality. DeepSeek is also faster than GPT 4, more practical** and, according to many experts, even understands regional idioms and cultural contexts better than its Western counterparts

### 9. Large Language Model (LLM)

A Large Language Model (LLM) is a **type of AI trained to understand and generate human language**. These models are built on deep learning techniques allowing them to process and generate text in a coherent, contextually appropriate manner. LLMs are used for various tasks, including **text generation, language translation, and summarization**

### 10. About F11 Bacteria

The bacteria supports bioaugmentation in wastewater treatment & contaminated soil cleanup. **Bioaugmentation is a technique where specific microorganisms are introduced to degrade persistent pollutants in contaminated environments**. It breaks the carbon-fluorine bond in PFAS, allowing degradation of toxic compounds.

### 11. About Silicon Carbide

It is a synthetic crystalline compound **composed of silicon (Si) and carbon (C)**. It is renowned for its hardness, thermal stability, and chemical resistance, making it a critical material across various industries

## **31 JANUARY**

### 1. Upanishads

The Upanishads are a collection of ancient Indian philosophical texts that form the final or concluding

part of the Vedas. They are often called **vedanta which means the end of the veda**. The word Upanishad can be translated as **“sitting near” or “sitting down beside,”** which refers to the tradition of students sitting near a teacher to learn spiritual wisdom.

### 2. Martyr Day

Mahatma Gandhi is revered as the Father of the Nation and he was the architect of India's freedom struggle. He was the most prominent face of India's freedom movement. He was **assassinated on January 30, 1948 by Nathuram Godse**. **The day has been observed as Martyrs' Day, also known as 'Shaheed Diwas' or 'Sarvodaya Day,'** to honour him and countless others who sacrificed their lives for India's freedom.

### 3. Constitutional Provisions for Domicile-Based Reservations

Article 16(2) prohibits **discrimination based on residence**, Article 16(3) provides an exception, allowing Parliament to enact laws prescribing residence-based conditions for government employment within a State or Union Territory.

### 4. About Inherited retinal diseases (IRDs)

They are also known as **Retinal dystrophies**. They are the most genetically varied group of disorders in humans. They are caused by **abnormal development or dysfunction of the photoreceptors or retinal pigment epithelium**. They result from mutations in over 300 genes responsible for retinal function. They can be inherited in different patterns, including autosomal recessive, autosomal dominant, X-linked, and less commonly, mitochondrial and digenic inheritance

### 5. Guantánamo Bay:



It forms an inlet of the Caribbean Sea, indenting southeastern Cuba. It is a **large and well-sheltered bay; it has a narrow entrance to a harbour and is capable of accommodating large vessels**.

**Ports:** It is served by the ports of Caimanera and Boquerón. The strategic importance of the bay—close to the Windward Passage between Cuba and Haiti that links the Atlantic Ocean to the Caribbean Sea and Panama. **Guantanamo Bay, widely known as “Gitmo,” has been used to house terrorism suspects since the September 11, 2001, attacks,** but it also has a small, separate facility known as the Migrant Operations Centre.

### **6. Household Consumption Expenditure Survey**

Recently, the **Ministry of Statistics and Programme Implementation (MoSPI)** published the summary findings of the second of the two consecutive surveys on household consumption expenditure survey. **Data collected in HCES is also used to measure poverty, inequality and social exclusion.** The Monthly Per Capita Consumption Expenditure (MPCE) compiled from HCES is the primary indicator used for most analytical purposes.

### **7. Enforcement Case Information Report (ECIR):**

The **ECIR is a formal entry of the complaint lodged by the Enforcement Directorate (ED).** There is no mention of the ECIR in the Prevention of Money Laundering Act, 2002 (PMLA Act) or Rules. Supreme Court held that ECIR cannot be equated with an FIR. **ED is not legally bound to provide a copy of the ECIR to the accused.**

### **8. Point Nemo**



Two young women officers of the Indian Navy onboard the sailing vessel **INSV Tarini** recently crossed **Point Nemo in the southern Pacific as a part of their efforts to circumnavigate the globe under Navika Sagar Parikrama-II.** Point Nemo, also known as the **Oceanic Pole of Inaccessibility,** holds the distinction of being the farthest point from any landmass on Earth.

### **9. Graphics Processing Unit (GPU):**



A GPU is an **electronic circuit board that can quickly perform many mathematical calculations.** Like a Central Processing Unit (CPU), a GPU is also a chip component in computing devices. The **technology was originally designed to speed up 3-D graphics rendering.** More recently, GPUs have been used beyond computer graphics in areas including high-performance **computing, machine learning, Artificial Intelligence (AI), weather forecasting and cryptocurrency mining.**

#### **CPU vs. GPU:**

CPUs are designed to **handle general-purpose tasks such as running applications and managing system resources.** On the other hand, GPUs are optimized for specific tasks such as **rendering 3D graphics and video decoding.** CPUs have fewer cores than GPUs, but each core is capable of handling more complex instructions. This means that CPUs can handle sequential tasks more efficiently than GPUs, but GPUs outperform CPUs when it comes to parallel tasks like image rendering or video encoding/decoding.