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General Studies I

The Copyright Issue in Carnatic Music

Context :

·   Carnatic music, a deeply respected and ancient form of Indian classical music, has historically remained outside the rigid framework of copyright laws.

·   This is primarily due to its reliance on improvisation and oral transmission rather than written compositions.

·   However, recent discussions during the Margazhi music season in Chennai have highlighted growing concerns about copyright in this genre.

·   The current legal system offers inadequate protection for performers, prompting debate on whether the law should adapt to better reflect the nature of Indian classical music.

The Legal Challenge: Copyright in Carnatic Music

A Unique Problem

·   The intersection of copyright law and Carnatic music poses a distinct challenge due to the genre's improvisational nature, traditional transmission, and historical legal context.

·   Unlike Western classical music, which depends heavily on written scores, Carnatic music is taught and preserved orally, passed down from teacher to student over generations.

·   This key difference complicates the application of intellectual property laws to an art form rooted in creative reinterpretation rather than fixed compositions.

Western Influence on Indian Copyright Law

·   India's copyright laws, first introduced in 1914 under British rule, were heavily influenced by Western legal traditions, particularly British copyright laws.

· The revised 1957 legislation continued to assume that musical compositions are fixed in written notation.

· This perspective aligns with Western classical music, where composers provide detailed scores specifying notes, dynamics, and articulations, leaving little room for improvisation by performers.

Challenges in Applying Copyright Laws to Carnatic Music

· Unlike Western compositions, Carnatic music does not strictly follow written notation, which serves only as a basic guide rather than a fully defined piece.

· Its essence lies in improvisation, known as **mano dharma sangeetam**, which includes raga alapana (melodic exploration), neraval (variation of a phrase), and kalpana swaras (spontaneous note sequences).

· Since these elements are not rigidly documented, they do not fit the legal definition of a "musical work" under copyright law.

· This raises a critical question: Should copyright laws be based on a Western framework, or should they evolve to recognize and protect traditional Indian art forms like Carnatic music?

Why Carnatic Music Has Largely Avoided Copyright Issues

· One key reason Carnatic music has remained outside mainstream copyright discussions is that most of its foundational compositions are in the public domain.

· Composers like Tyagaraja, Purandara Dasa, and Gopalakrishna Bharati created their works before modern copyright laws were established, making their compositions freely accessible for anyone to perform.

· However, Carnatic musicians do not simply replicate these compositions—they reinterpret them, incorporating intricate improvisations and personal stylistic elements.

· Despite their artistic value, these modifications currently lack copyright protection, raising important legal questions:

Does an improvised section in a performance qualify as a new, copyrightable work?

·   If a musician alters a composition's raga or tempo, should they hold rights over that specific rendition?

·   Should a performer's unique style—such as Madurai Mani Iyer's distinctive approach to *Eppo Varuvaro*—be recognized as intellectual property?
Current Copyright Protections and Their Gaps
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Rights of Composers and Lyricists
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·   Copyright law grants composers and lyricists rights over their works for their lifetime plus 60 years.
This prevents unauthorized commercial use of their compositions.
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However, most iconic Carnatic compositions by figures like Tyagaraja, Muddusvami Dikshitar, and Shyama Shastri are already in the public domain, allowing unrestricted performance and recording.

Mechanical Rights (Rights Over Sound Recordings)

·   When a song is recorded onto a physical or digital medium (e.g., a CD or audio file), the recording entity—whether a record label or an individual artist—receives mechanical rights over that specific recording for 60 years.

·   While this offers some level of protection, it does not extend to live performances, where improvisation is central.

Performers' Rights

·   Performers, including vocalists and instrumentalists, have the legal right to prevent unauthorized recordings of their performances.

·   This is particularly important for live concerts, where musicians may not want their music recorded and distributed without their consent.

·   In principle, performers should also be entitled to royalties from digital streams or sales of their performances.

The Need for Legal Reform

·   The spontaneous nature of Carnatic improvisation makes it difficult to protect under existing copyright laws.

·   Unlike formally documented compositions, improvisations are often fleeting, complicating claims of ownership.

·   However, performers' contributions should not be disregarded—they deserve the right to commercially benefit from their unique interpretations, just as composers and lyricists do.

Steps Towards a More Inclusive Copyright Framework

·   Recognizing Improvisation as Intellectual Property

·   Legal provisions should acknowledge original variations and improvisations in performances, granting musicians limited rights over their creative additions.
Strengthening Performers' Rights
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·   Existing laws protecting performers should be reinforced, ensuring that artists have control over and can profit from recordings of their concerts.
Unauthorized uploads to streaming platforms should face stricter legal consequences.
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Ensuring Fair Royalty Distribution
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·   A fair system should be established to ensure performers receive appropriate royalties from digital platforms and commercial releases.
Ensuring Fair Compensation for Carnatic Musicians
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Strengthening Royalty Distribution
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·   Streaming platforms and concert venues should be obligated to compensate artists for their performances.

·   The royalty system for digital platforms must be improved to ensure musicians receive fair financial benefits from their work.

Conclusion

- India's current copyright laws fail to account for the unique nature of Carnatic music, leaving performers at risk of exploitation.

- While classical compositions remain in the public domain, the artistic creativity involved in their interpretation deserves legal recognition and protection.

- Rather than forcing music into rigid legal frameworks, copyright laws should adapt to safeguard the rights of musicians.

- By acknowledging improvisation as intellectual property and enhancing performers' rights, India can ensure that Carnatic musicians gain both the recognition and financial security they rightfully deserve.

Classification of Denotified Tribes: Advancing Social Justice

Why is this Important?

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 after three years of research. **Historical Context and Need for Classification**

- Denotified tribes were previously branded as "criminal" under the Criminal Tribes Act of 1924, which was repealed in 1949.

- Several commissions, including the Kaka Kalelkar Commission (1955), Mandal Commission (1980), Renke Commission (2008), and Idate Commission (2017), attempted but failed to classify these communities comprehensively.

- The 2017 Idate Commission report identified 1,200 denotified, semi-nomadic, and nomadic tribes, including 267 unclassified groups.

- In response, the Indian government formed a Special Committee under NITI Aayog in 2019, assigning AnSI and TRIs the responsibility of ethnographic classification.

Key Findings of the Study

· 268 communities classified: This marks the first systematic documentation of these tribes.

· 179 communities recommended for SC/ST/OBC inclusion: This aims to provide them with 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 ignited discussions on reservations and special status.

Impact on Reservation and Welfare Policies

· The classification enables denotified tribes to benefit from government welfare programs reserved for SCs, STs, and OBCs, including educational and employment opportunities. However, this decision has also sparked political debates.

· Within the Development and Welfare Board for Denotified, Nomadic, and Semi-Nomadic Communities, two perspectives have emerged:
Support for Inclusion in SC/ST/OBC Lists:
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Guarantees access to education, employment, and social welfare programs.
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Provides legal recognition and identity to these marginalized communities.
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Demand for a Separate Reservation Category:
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· Advocates argue that a distinct classification would better address the unique socio-economic challenges of these communities.

· This classification marks a significant step towards social justice by ensuring these historically marginalized groups receive the recognition and support they deserve.

Denotified Tribes Classification: A Step Towards Social Justice

· Concerns Over Merging with Existing Categories

· 		Some argue that integrating these tribes into SC/ST/OBC groups might reduce reservation benefits for communities already classified under these categories.

Challenges and Concerns

· 	Political Controversies: Activists in states like Uttar Pradesh, Haryana, Madhya Pradesh, and Gujarat have raised concerns about the classification, fearing it could disrupt existing reservation structures.

· 		Delays in Implementation: Despite recommendations from multiple commissions, government action has been slow, delaying much-needed welfare benefits.

· 	Historical Misclassification: Errors in past census records have sometimes classified tribes as castes, leading to confusion regarding their identity and legal status.

Way Forward

· 	The AnSI and TRIs have submitted their final report to the Special Committee under NITI Aayog.

· 	The committee is currently reviewing the recommendations before presenting a final report to the government.

If accepted:

· 	State governments will have a clearer process for adding these tribes to reservation lists.

· 	New welfare programs could be launched to address socio-economic disparities.

· 	The discussion around creating a separate reservation category for denotified tribes may gain traction.

Conclusion

· 	Classifying denotified, semi-nomadic, and nomadic tribes is a significant step toward correcting historical injustices and ensuring their access to welfare schemes.

· 		However, the implementation process remains complex, with political and legal challenges ahead.

·   The government's final decision will play a crucial role in shaping India's future reservation policies and social justice framework.

Crosspathy in India: A Controversial Healthcare Practice

Why in the News?

The Maharashtra Food & Drugs Administration (FDA) recently allowed homoeopathic practitioners with a certificate in modern pharmacology to prescribe allopathic medicines.
Understanding Crosspathy

·   Crosspathy refers to the practice where medical professionals trained in one system of medicine (e.g., Ayurveda, Homeopathy, or Unani) prescribe treatments from another system, primarily Allopathy (modern medicine).

·   This practice has sparked significant debate in India due to its impact on patient safety, legal frameworks, and medical ethics.

Legal and Regulatory Framework

·   Permissibility: Crosspathy is generally illegal unless explicitly permitted by state laws or special government orders.

·   Judicial Rulings: The Supreme Court has ruled that practising outside one's trained expertise without proper authorization amounts to medical negligence.

·   Legal Actions: Practitioners have faced legal scrutiny under the Indian Medical Council Act and state-specific medical regulations.

Reasons Behind Crosspathy in India

·   **Doctor Shortages:** India has a severe shortage of allopathic doctors, particularly 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 used to fill this gap.

- **Policy Gaps:** Some states, like Maharashtra and Goa, have permitted limited crosspathy to address healthcare accessibility issues.

- **Economic Factors:** Many rural patients cannot afford specialist doctors, making AYUSH practitioners a more affordable and accessible option.

Challenges & Criticism

- **Patient Safety Risks:** AYUSH practitioners may lack adequate training in modern medicine, leading to misdiagnoses and improper treatments.

- **Legal Uncertainty:** Conflicting court rulings and weak regulatory oversight, especially in rural areas, create confusion about the legal status of crosspathy.

- **Professional Opposition:** The Indian Medical Association (IMA) strongly opposes crosspathy, arguing that it lowers healthcare standards.

Recent Developments: Maharashtra's Directive

- The Maharashtra FDA has clarified that homoeopathic practitioners with a modern pharmacology certificate can prescribe allopathic medicines.

- This follows a 2014 decision redefining "registered medical practitioners" under the Maharashtra Medical Council Act to include certified homoeopaths.

- A directive in late 2024 mandated that chemists must honour prescriptions from these practitioners.

Controversy and Opposition

- **IMA's Stand:** The IMA has criticized this decision, stating that a short pharmacology course cannot replace an MBBS degree.

- **Judicial Challenges:** A 2017 Bombay High Court stay on a similar notification contradicts the new directive.

- Past Supreme Court rulings have categorized unauthorized cross-system practice as medical negligence.

Government's Justification

· The directive aims to mitigate India's doctor shortage, particularly in rural regions.

· With 13 lakh registered allopathic doctors and 5.65 lakh AYUSH practitioners, the government sees crosspathy as a way to bridge healthcare gaps.

Implications of the Decision

· **For Patients:** Raises concerns about treatment safety and medical negligence, especially in underserved areas.

· **For the Healthcare System:** Challenges in regulating prescription practices and maintaining medical standards.

· **For Policy and Governance:** Highlights the need for better rural healthcare incentives and reforms to attract MBBS doctors to underserved areas.

Conclusion

· Maharashtra's decision represents a significant shift in healthcare policy. While it aims to improve access to medical care, it also raises ethical, legal, and practical concerns.

· A sustainable solution must balance patient safety, medical expertise, and healthcare accessibility while addressing workforce shortages effectively.

India's Path to a Healthy Nation by 2047

Why in the News?

India's vision of becoming a developed nation (Viksit Bharat) by 2047 depends heavily on the health and productivity of its population. To realize this goal, strong healthcare systems must be established by 2025, emphasizing prevention, equitable access to treatment, and the adoption of digital innovations.

Key Pillars for a Healthy India:

· **Universal Health Coverage (UHC) via Primary Healthcare:** Financial and Service Goals: UHC ensures financial security and broad access to healthcare services.

·   **Resource Allocation:** Increased public funding, supported by central and state budgets, is critical.

·   **Health Workforce**: Addressing the shortage of skilled doctors by training technology-enabled frontline workers and allied health professionals.

·   **Ayushman Bharat as a Model for Change**: Upgraded primary care systems.

     o Financial safeguards for vulnerable populations.

     o Improved health infrastructure.

     o Integration of digital health technologies.

·   **Digital Health Mission:** Essential for tracking diseases, monitoring programs, and unifying healthcare systems.

Data-Driven Strategies for a Healthy India:

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·   **Disaggregated and Integrated Data Systems:** Local-level data at district and block levels for informed, equitable, and efficient decision-making.

     o Addressing the growing burden of non-communicable diseases (NCDs) and mental health issues through accurate tracking of trends and risk factors.

     o Strengthening surveillance for zoonotic diseases, as current systems like the Integrated Disease Surveillance Programme (IDSP) are limited.

·   **Advanced Surveillance Systems:** Real-time monitoring of infectious diseases, including zoonotic threats, using big data analytics.

     o Adoption of techniques like wastewater surveillance and antimicrobial resistance (AMR) monitoring.

     Implementing a One Health Approach to integrate human, animal, and environmental health data for tackling climate-related health risks.

     o Digitally Integrated Healthcare for a Healthy India:

- **Patient-Centered Data Systems:** Ensuring interoperability of diagnostic and treatment data across healthcare facilities.

- Addressing challenges like the lack of private sector integration, which disrupts care continuity.

- **Public-Private Collaboration**: Connecting primary care with publicly funded health insurance programs (e.g., PMJAY) to integrate public and private health data.

- Leveraging artificial intelligence (AI) to improve diagnostics and clinical management using Indian health data.

- **Community Participation**: Using digital tools for crowdsourcing outbreak surveillance and resolving program implementation challenges.

Conclusion:

- India's goal of achieving a healthy and productive population by 2047 demands immediate and sustained action.

- By 2025, a digitally integrated, data-driven, and universally accessible healthcare system must be established to drive the nation toward its health objectives.

Why Are Fertility Levels Declining in India?

Introduction:

- A global demographic analysis by the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2021 highlights a significant decline in fertility rates worldwide, including in India.

- The report shows a sharp drop in India's Total Fertility Rate (TFR) from 6.18 in the 1950s to 1.9 in 2021, falling below the replacement level of 2.1.

- Projections indicate that this rate could further decline to 1.04 by 2100, raising concerns about socio-economic consequences.

Reasons for Declining Fertility in India:

· Increased Female Literacy and Workforce Participation:

· Women's empowerment through education and greater involvement in the workforce has played a key role in reducing fertility rates.

· **Changing Societal Attitudes:** Delayed marriages or the decision to remain unmarried are becoming more common as women prioritize careers and financial independence over traditional family roles.

· **Infertility and Abortions:** Rising infertility rates among both men and women, along with increased abortion rates, are contributing to the decline.

· **Migration:** Many young Indians are moving abroad for education and employment, often settling there and raising families outside India.

· **Urbanization and Modern Aspirations:** Urbanization has led families to opt for fewer children to align with economic and social aspirations.

Regional Implications:

Southern States: States like Kerala experienced demographic transitions earlier, achieving replacement-level fertility by the late 20th century.

Challenges include:

· **Ageing Population:** The elderly population is growing faster than the younger demographic.

· **Shrinking Workforce:** Youth migration for better opportunities has created labour shortages.

· **Healthcare Demands:** Increased pressure on healthcare systems to support the elderly.

· **Kerala's Specific Case:** High labour wages and quality of life attract migrant workers, who may constitute about one-sixth of the population by 2030.

· Delayed motherhood has led to older mothers and higher pregnancy-related health issues.

Global Context:

· Countries like South Korea illustrate the challenges of reversing fertility declines.

· Despite significant investments in pro-natalist policies, South Korea's fertility rate dropped from 0.78 in 2022 to 0.73 in 2023, highlighting the difficulty of reversing such trends.

Future Implications for India:

· **Economic Impacts:** A shrinking workforce could hinder economic growth.

· Rising healthcare costs due to an ageing population.

· **Social Challenges:** Higher dependency ratios may strain families and welfare systems.

· Reduced innovation and productivity due to fewer young workers.

Way Forward:

· **Socio-Economic Policies:** Focus on economic growth, job creation, and youth support to mitigate the effects of declining fertility.

· **Leveraging the Elderly Population**: Utilize the potential of senior citizens through skill development and economic participation.

· **Support for Families:** Provide incentives such as tax benefits, childcare support, and housing subsidies to encourage young couples to have children.

Conclusion:

· India's declining fertility rates indicate a significant demographic shift with long-term socio-economic implications.

· Proactive policies addressing economic, healthcare, and social challenges are essential to adapt to this transformation.

· Learning from global experiences and focusing on sustainable development will help India navigate these challenges effectively.

Assessing India's Natural Disaster Risks and Economic Consequences

Overview:

· India has seen a sharp increase in economic losses due to natural disasters, driven by both the growing frequency of extreme weather events and the country's susceptibility.

· A report by global insurer Swiss Re estimates that in 2023 alone, natural calamities led to economic losses of approximately $12 billion—far surpassing the $8 billion annual average recorded over the past decade.

Major Disasters of 2023:

1. Northern India and Sikkim Floods (July 2023): Affected Regions: Himachal Pradesh (including Shimla) and Delhi.

Consequences: Heavy rainfall from July 10-15 caused severe damage, disrupting infrastructure and daily life.

2. Tropical Cyclone Biparjoy (June 2023):

Landfall: The Category 3 storm struck Kutch, Gujarat, also impacting Maharashtra and Rajasthan.

Effects: Strong winds, heavy rainfall, and storm surges led to significant damage, temporarily shutting down key ports such as Kandla and Mundra.

3. Tropical Cyclone Michaung (December 2023):

Landfall: Made an impact in Chennai, Tamil Nadu.

Impact: Intense rainfall led to substantial economic losses and urban disruption.

India's Key Vulnerabilities:

· **Monsoon-Induced Flooding:** Over the past 20 years, floods have accounted for 63% of India's annual disaster-related economic losses.

- **The country experiences two major monsoon seasons**: Southwest Monsoon (June-September): Which leads to severe floods, as seen in Kerala (2018) and Uttarakhand (2013).

- Northeast Monsoon (October-December): This has caused major flooding events, such as the Chennai floods (2015).
  Economic and Industrial Exposure:

  - Highly industrialized states—Gujarat, Maharashtra, and Tamil Nadu—account for 36.8% of India's total industrial output and are also among the most disaster-prone regions:

  - Gujarat: Faces risks from floods, cyclones, and earthquakes.

  - Maharashtra: Mumbai, in particular, is highly vulnerable to floods and cyclones.

  - Tamil Nadu: Frequently hit by cyclones and monsoon-related flooding, especially in Chennai.

Earthquake Hazards:

- Cities like Delhi and Ahmedabad face significant seismic risks. A high-magnitude

- earthquake in the Himalayas or near a major urban centre like Mumbai could result in catastrophic damage, potentially exceeding the losses caused by the 2001 Bhuj earthquake in Gujarat.

Challenges in Resilience and Insurance:

- Despite recurring large-scale losses, insurance coverage remains inadequate:

- Underinsurance: Over 90% of households and businesses are either uninsured or underinsured, leaving them financially vulnerable.
  Costliest Flood Disasters (Adjusted to 2024 Prices):

  Mumbai floods (2005): $5.3 billion in damages.

  Chennai floods (2015): $6.6 billion in damages.

Strengthening Disaster Resilience: A Three-Pronged Strategy

Swiss Re proposes a structured approach to enhance disaster preparedness and close the insurance gap:

Identifying High-Risk Zones: Use detailed data to pinpoint disaster-prone areas.

Focus mitigation efforts on cities like Ahmedabad, Mumbai, and Chennai.

Improved Risk Assessment:

· Utilize advanced modelling to evaluate potential threats and exposure levels.

· Integrate real-time and comprehensive data for accurate risk analysis.

· Expanding Reinsurance Solutions:

· Develop specialized reinsurance programs to address protection gaps.

· Encourage affordable insurance coverage for both businesses and households.

Conclusion:

· India's fast-paced economic growth has outstripped its ability to effectively manage and mitigate natural disaster risks.

· The rising frequency of extreme weather events underscores the urgent need for stronger disaster preparedness, increased insurance penetration, and comprehensive resilience-building strategies.

· By proactively addressing these challenges, India can better protect its economy and citizens from the escalating threats posed by natural calamities.

Transforming Masculinity: Changing Perspectives and Redefining Roles

Context

·   The International Day for the Elimination of Violence Against Women (November 25) serves as a reminder of the ongoing global crisis of gender-based violence.

·   Despite years of advocacy, nearly one in three women worldwide experience violence at the hands of men.

This troubling reality highlights the necessity of involving men not only as part of the problem but also as essential contributors to ending violence against women.

Understanding the Causes of Violence Against Women and Engaging Men

·   Early Socialization and Harmful Expectations

·   Many cultures raise boys with ideas that associate masculinity with dominance and control.

·   Phrases like ***"boys don't cry"*** and ***"man up"*** discourage emotional expression, leading to suppressed emotions that can later manifest as frustration, aggression, or an inability to process feelings in healthy ways.

·   Boys are often taught to equate strength with dominance, reinforcing the idea that controlling others, especially women, is necessary to validate their masculinity.

·   These messages are further reinforced by family roles, where decision-making is typically seen as a male domain, while caregiving and household responsibilities are designated for women.

The Impact of Toxic Masculinity

·   Toxic masculinity, which promotes aggression, competition, and dominance, exacerbates these issues.

·   Men influenced by such ideals may resort to violence to assert control, particularly when their authority is questioned.

·   This mindset significantly contributes to domestic violence and other forms of gender-based harm.

·   It also negatively affects men, trapping them in cycles of emotional detachment, loneliness, and self-destructive behaviours.

· The inability to express vulnerability can result in mental health struggles such as anxiety, depression, and substance abuse.

Media and Cultural Narratives

· Films, advertisements, and mainstream culture often depict men as aggressive protectors and providers, while women are portrayed as passive caretakers.

· These narratives reinforce rigid gender roles and discourage deviation from traditional norms.

· Young boys consuming such portrayals may internalize them, further perpetuating toxic masculinity.
In certain societies, religious and cultural beliefs also reinforce restrictive gender norms.

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Engaging Men in Gender Equality Efforts

· In recent years, efforts to address gender equality have increasingly focused on men's roles in challenging harmful stereotypes.

· Research and grassroots initiatives have demonstrated effective methods for involving men in redefining masculinity.

· These programs reflect a growing willingness among men to actively contribute to gender equality, not just as supporters but as key change-makers.

Case Study: India's Initiatives for Gender Equality

· **UNESCO's *Transforming MENtalities* Initiative**

UNESCO launched ***Transforming MENtalities*** to address the root causes of gender inequality by engaging men and boys in the conversation.

· This initiative moves beyond viewing men as allies, encouraging them to take active roles in transforming societal norms.

· It promotes alternative, healthier ideas of masculinity and fosters positive male participation in families and communities.

· In collaboration with the International Centre for Research on Women (ICRW), UNESCO produced the report ***Engaging Men and Boys: A Report on Pathways to Gender Equality in India***, documenting successful programs in shifting gender attitudes.

Key Programs and Their Impact

· Mardon Wali Baat (A Man's Thing)

· Led by **The YP Foundation**, this program uses storytelling and social media to engage young men in discussions on masculinity.

· It challenges notions that link strength to dominance and promotes values of respect, emotional openness, and equality.

· fostering conversations about positive masculinity, empowers young men to challenge harmful stereotypes in their communities.
Gender Equity Movement in Schools (GEMS)

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· A partnership between ICRW and Rajasthan's Education Department, GEMS educates adolescents about the dangers of toxic masculinity through interactive classroom discussions.

· These discussions help boys recognize the impact of gender roles and encourage them to embrace more equitable perspectives.

· One participant shared, ***"I used to believe that boys should only handle outdoor tasks. Now, I understand that household responsibilities should be shared equally."***

· Such reflections create ripple effects, influencing not just individuals but their families and peers.
Dekh Rekh (Caring for Each Other) and Hamari Shaadi (Our Marriage)

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· These programs focus on involving men in traditionally female-dominated household responsibilities, such as family planning and nutrition.

· By encouraging male participation in domestic tasks, these initiatives challenge deeply ingrained gender norms and promote everyday gender equality.

The Path Ahead

Reshaping Norms to Address Root Causes

· Educating children from an early age is essential to breaking stereotypes, and helping boys understand that empathy, vulnerability, and equality are strengths rather than weaknesses.

· Families, schools, and communities must actively model and promote healthier definitions of masculinity.

· Public awareness campaigns, media representation, and strong role models can reinforce these messages by demonstrating that masculinity can be defined by respect, emotional intelligence, and gender equality.

· Community-Led Approaches

· The success of these programs is rooted in their community-driven nature, ensuring cultural relevance and deeper engagement.

· By incorporating local traditions and social dynamics, these initiatives become more impactful and sustainable.

· Using interactive methods like storytelling, role-playing, and discussions makes these concepts more relatable.

· Additionally, involving men and boys within their own communities ensures that the shift towards gender equality is organic and long-lasting rather than externally imposed.

Conclusion

· It is essential to acknowledge and celebrate men and boys who challenge traditional masculinity and advocate for equality.

· By redefining what it means to "be a man," societies can foster environments where all individuals, regardless of gender, are free from violence and can reach their full potential.

· Through education, advocacy, and collective action, gender-based violence can be eradicated, paving the way for a more just and inclusive world.

Kumbh Mela: A Deep Dive into Its Origins, Significance, and Evolution

Why in the News? The Maha Kumbh Mela 2025, a grand religious festival held once every 12 years, will commence in Prayagraj on January 13 with the first holy bath (*snan*). Expected to draw over 450 million devotees over a span of one and a half months, it remains one of the largest gatherings in the world. While the exact origins of the Kumbh Mela are debated—some tracing it to ancient scriptures like the *Vedas* and *Puranas*, while others link it to developments in the last two centuries—it continues to be an important spiritual and cultural event.

Understanding the Kumbh Mela

Origins: The Sanskrit term *Kumbh* translates to 'pitcher' or 'pot.'

·   The festival is linked to the legend of the *Samudra Manthan* (churning of the ocean) in Hindu mythology, where gods (Devas) and demons (Asuras) battled over *amrita* (the nectar of immortality).

·   To prevent the Asuras from seizing it, Indra's son, Jayant, fled with the *amrita* pot, safeguarded by celestial beings such as the Sun, Saturn (Shani), Jupiter (Brihaspati), and the Moon.

·   As Jayant carried the nectar for 12 divine days (equivalent to 12 human years), drops of *amrita* are believed to have fallen at four sacred locations—Haridwar, Prayagraj, Ujjain, and Nashik-Trimbakeshwar—where the Kumbh Mela is now held.

Types and Frequency of Kumbh Mela

·   Maha Kumbh (Poorna Kumbh): Held every 12 years.

·   Ardh Kumbh: Takes place every 6 years in Prayagraj and Haridwar.

Significance of the Rivers

- The Kumbh Mela is hosted at four major riverbanks, considered spiritually potent during the festival:

- Haridwar: River Ganga

- Prayagraj: Confluence of Ganga, Yamuna, and the mythical Saraswati

- Ujjain: River Kshipra (believed to have originated from Lord Vishnu's heart in his *Varaha* incarnation)

   Nashik-Trimbakeshwar: River Godavari (revered as the Ganga of the south)

- Bathing in these rivers during specific celestial alignments is believed to absolve sins and bring spiritual merit (*punya*).

Spiritual Significance and the Role of Sadhus

- The festival attracts sadhus (ascetics) from various monastic orders (*akhadas*), providing devotees with opportunities to engage in spiritual learning.

- Kumbh Mela is a significant platform for these holy men to share their wisdom, rituals, and traditions.

The Astrological Basis of Kumbh Mela

- The location and timing of each Kumbh Mela are determined by planetary movements, specifically the positions of Jupiter, the Sun, and the Moon.

- Jupiter's 12-year cycle around the Sun corresponds with the 12-year interval of the Maha Kumbh Mela.

   Unique celestial alignments at each of the four sites dictate when the festival is held.

Historical References to the Kumbh Mela

Ancient Mentions

- The *Skanda Purana* is often cited as evidence of the Kumbh Mela's antiquity, though no existing versions explicitly describe the festival in its current form.

- While the *Samudra Manthan* story is referenced in multiple scriptures, none specifically mention the spilling of *amrita* at the four Kumbh locations.

· Some scholars believe that verses in the **Rig Veda** highlight the spiritual benefits of the Kumbh Mela.

Xuanzang's Account

· The 7th-century Chinese traveller Xuanzang described a large fair at Prayag, but it is uncertain if he was referring to the Kumbh Mela as it exists today.

· Historian Kama Maclean argues that an older festival, **Magh Mela**, held in Prayag, was rebranded as Kumbh Mela after 1857 to avoid British intervention in religious gatherings.

Adi Shankaracharya's Influence

The 8th-century philosopher Adi Shankaracharya is believed to have played a key role in formalizing periodic religious fairs, creating a structured platform for Hindu ascetics and scholars to interact with the public. **Evolution of the Kumbh Mela**

· Some experts suggest that the Kumbh Mela originated in Haridwar, as the placement of Jupiter (**Brihaspati**) in the zodiac sign of Aquarius (**Kumbh Rashi**) aligns with this site.

· The tradition likely solidified after the 12th century CE, during the **Bhakti** movement, as riverbank fairs have been a part of Hindu religious practices for centuries.

· The Kumbh Mela's association with river worship and travelling ascetics may have contributed to its formalization at the four sacred sites.

Historical Records

· Documents from the Mughal era, along with records kept by monastic orders (**sanyasi akhadas**), suggest that the Kumbh Mela evolved over time into a major religious event.

· These gatherings allowed ascetics to gain disciples and provided pilgrims with spiritual enrichment.

Kumbh Mela's Role in India's Nationalist Movement

· Allahabad's Emergence as a Political and Cultural Hub

- Following the Revolt of 1857, Allahabad (now Prayagraj) became the capital of the North-Western Provinces, emerging as a key political and administrative centre.

- The establishment of institutions such as the Allahabad High Court (1867) and Allahabad University (1887) made the city a hub for intellectual and nationalist activities.

- By the late 19th century, Allahabad had become a focal point for both religious and political movements, with the Kumbh Mela playing a crucial role.
Religious Gatherings as a Tool for Nationalism
-

- During the late 19th century, nationalist leaders recognized the potential of mass religious gatherings like the Kumbh Mela for political mobilization.

- Since the British followed a policy of non-interference in religious affairs, Indian leaders utilized these festivals to spread nationalist ideas.

- By the early 20th century, prominent figures such as Bal Gangadhar Tilak and Gopal Krishna Gokhale used the Kumbh Mela to promote Swadeshi and other nationalist causes.

- Congress and the Role of Religious Leaders

- By the 1930s, the Indian National Congress strategically used Kumbh Mela as a venue for nationalist outreach.

- Ascetics and religious leaders played an important role in disseminating anti-colonial messages, blending spiritual authority with political activism.

- During the 1936 Ardh Kumbh, symbols like the idol of **Bharat Mata** and political processions reinforced the connection between spirituality and nationalism.

Conclusion

- Over time, the Kumbh Mela has evolved from a regional religious festival into a major national event with political and cultural significance.

- The festival's transformation was driven by religious leaders, ascetics, and nationalist figures who used it as a platform to resist colonial rule and promote India's sovereignty.

· Today, it remains a powerful symbol of faith, unity, and cultural heritage, drawing millions from around the world in celebration of spiritual renewal.

Groundwater Contamination in India

Why in the News?

A recent assessment by the Central Ground Water Board (CGWB) has revealed that several Indian states are facing significant groundwater contamination due to high nitrate levels.
Rising Nitrate Levels in Groundwater

· Increase in Affected Districts

· The number of districts experiencing nitrate contamination rose from 359 in 2017 to 440 in 2023, affecting nearly 56% of the country.
Nitrate concentrations above 45 mg/l are considered excessive.

·

Groundwater Testing and Trends

· 2017 Data: Out of 13,028 samples tested, 21.6% showed nitrate levels above the permissible limit.

· 2023 Data: Among 15,239 samples tested, 19.8% exceeded safe limits. While the percentage of contaminated samples remained relatively stable, the number of affected districts increased.

Health Implications

High nitrate levels in groundwater can cause methemoglobinemia (blue baby syndrome), which reduces the ability of red blood cells to transport oxygen, posing serious risks to infants and vulnerable groups. **Environmental Consequences**

Excess nitrate in groundwater contributes to algal blooms in water bodies, depleting oxygen levels and harming aquatic ecosystems.

Sources of Nitrate Contamination Agricultural Practices: Excessive use of nitrogen-based fertilizers such as ammonium nitrate, calcium nitrate, urea, and diammonium hydrogen phosphate leads to nitrate leaching into groundwater. **Forms of Dissolved Nitrogen in Groundwater**

·   Nitrate (NO_3^-)

·   Ammonium (NH_4^+)

·   Ammonia (NH_3)

·   Nitrite (NO_2^-)

·   Nitrogen gas (N_2)

·   Nitrous oxide (N_2O)

·   Organic nitrogen

Regional Analysis of Nitrate Contamination

States with the Highest Proportion of Contaminated Groundwater Blocks

·   Rajasthan: 49% of samples exceeded permissible nitrate levels.

·   Karnataka: 48% of tested samples showed contamination.

·   Tamil Nadu: 37% of samples had excessive nitrate levels.

·   States with Long-Standing Nitrate Issues

·   Rajasthan, Madhya Pradesh, and Gujarat have consistently faced nitrate contamination since 2017.

Emerging Nitrate Concerns in Central and Southern India

·   Rising nitrate contamination has been observed in several districts in these regions, prompting concerns.

· Notable contamination levels:

Maharashtra: 35.74%

Telangana: 27.48%

Andhra Pradesh: 23.5%

Madhya Pradesh: 22.58%

Other Major Groundwater Contaminants

· **Key Contaminants :** Arsenic, Iron, Fluoride, and Uranium: These elements significantly affect groundwater quality in addition to nitrate contamination.

· **Fluoride Contamination:** 9.04% of groundwater samples had fluoride levels exceeding the safe limit—high-risk states: Rajasthan, Haryana, Karnataka, Andhra Pradesh, and Telangana.

· **Uranium Contamination :** Several groundwater samples showed uranium concentrations above 100 ppb, far exceeding the safe limit of 30 ppb.

Most Affected States: Rajasthan and Punjab reported the highest number of contaminated samples, followed by Gujarat, Haryana, Tamil Nadu, Andhra Pradesh, and Karnataka.

Primary Cause: Over-extraction of groundwater, where withdrawal surpasses natural replenishment, exacerbates contamination issues.

State of Groundwater in 2024

Groundwater Extraction: The current extraction rate stands at 60.4%, a trend consistent since 2009.

Safe Zones: Around 73% of groundwater blocks are classified as 'safe,' indicating a balance between withdrawal and replenishment.

Central Ground Water Board (CGWB)

About CGWB

· A key institution under the Ministry of Jal Shakti, CGWB is responsible for monitoring, managing, and regulating groundwater resources.

· It operates a vast network of observation wells to assess groundwater quality and availability.

· The board also provides technical guidance, promotes sustainable groundwater practices, and formulates policies to tackle groundwater challenges.

Headquarters Location: Bhujal Bhawan, Faridabad, Haryana.

· Organization Structure: Led by a Chairman with five members overseeing operations.

· Groundwater Level Monitoring

· Observation Network: CGWB manually monitors groundwater levels using 26,000 observation wells.

· Digital Integration: Since 2023, around 16,000-17,000 piezometers equipped with digital water level recorders have been transmitting real-time data to a centralized system.

Southern California Wildfires 2025

Why in the News?

· Wildfires in Los Angeles, California, have resulted in 10 fatalities, the evacuation of over 130,000 residents, and widespread destruction of homes, including those of well-known figures like Paris Hilton and Billy Crystal.

· Major fires, including the Palisades, Eaton, Sunset, Hurst, and Lidia fires, continue to burn, particularly impacting areas such as Hollywood Hills. The ongoing crisis has also delayed the announcement of the Oscars nominations. While wildfires are a recurring issue in California, the intensity and rapid spread of these winter wildfires are highly unusual.

California Wildfires 2025

Origin and Timeline

- The first fire ignited on January 7 in Los Angeles' Pacific Palisades neighbourhood.

- This is one of the worst firestorms in recent history, occurring unexpectedly in January, a month typically considered the coldest of winter.
- Unusual Timing and Drought Conditions

- Wildfire season in California typically runs from June to October, making these January fires an anomaly.

- Southern California has been experiencing severe drought, with only 40.9% of the state drought-free as of December 31, 2024, a drastic decline from 96.65% the previous year.

Possible Causes of the California Wildfires

- While the exact cause remains uncertain, power lines damaged by strong winds are a likely factor.
- Three Primary Factors Contributing to the Fires

- **Weather Patterns:** From Wet Winters to Extreme Dryness

- Heavy rainfall in 2022 and 2023 led to dense vegetation growth in the Los Angeles area.

- The winter of 2024-25 has been exceptionally dry, turning this vegetation into highly flammable material.

- **NASA Report:** Since October, Southern California has received almost no rainfall, making this Los Angeles' driest start to a water year since 1944.
- **Santa Ana Winds**: A Major Accelerator

- These winds, common in the region, have been exceptionally strong this year.

- They originate from high-pressure systems over the Great Basin, moving westward.

- As they travel, they become hotter, drier, and faster, increasing the fire spread by fanning flames across dry vegetation and wooden structures.

Impact of Climate Change

- Climate change has worsened extreme weather conditions, including wildfires.

·   Rising global temperatures, earlier snowmelts, and prolonged dry seasons have increased the stress on vegetation, making it more flammable.

Santa Ana Winds: The Driving Force Behind the Fires
What Are Santa Ana Winds?

·   These are hot, dry, and powerful winds that originate in the inland deserts of Southern California and blow toward the coast.

·   While most common in fall and winter, they can occur at any time of the year.

·   Their dry and forceful nature makes them particularly dangerous during wildfire outbreaks.

Causes of Santa Ana Winds

·   High-Pressure Systems Over the Great Basin

·   The Great Basin (covering parts of Nevada, Utah, and California) experiences high-pressure air systems that create a clockwise air circulation.
This pushes air toward the lower-pressure coastal regions of California.

·   Descending Air and Drying Effect

·   As the winds descend from high elevations (such as the Sierra Nevada and Santa Ana Mountains) to lower altitudes, they:
Compress, which increases their temperature.

·   Lose moisture, making them extremely dry.

·   Acceleration Through Narrow Passages

·   The winds are channelled through mountain passes and canyons, increasing their speed.
Some gusts have exceeded 100 mph (160 km/h).

Key Characteristics of Santa Ana Winds

· Hot and Dry: They heat up as they descend, further drying out vegetation.

· Strong Gusts: Capable of causing power outages and property damage.

·   Wildfire Fuel: Their dryness and speed intensify wildfires, spreading flames at an alarming rate

Decoding the Indus Script: Unlocking Insights into Ancient Civilizations

Background

The Indus Valley Civilization (IVC), also called the Harappan Civilization, thrived between 3000-1500 BCE, covering parts of present-day India, Pakistan, and Afghanistan. Despite being one of the earliest urban societies, the Indus script remains undeciphered, restricting our comprehension of its social, political, and cultural structures. Recently, the Chief Minister of Tamil Nadu announced a $1 million reward for cracking the Indus script, highlighting its significance and potential ties to the Dravidian language family.

Why Is Deciphering the Indus Script Important?

·   **Understanding Harappan Society:**   The inability to interpret the script limits our knowledge of governance, daily life, and societal organization in the Indus Valley.

·   Unlike Egyptian hieroglyphs and Mesopotamian cuneiform, which have been translated, the Indus script remains an enigma.

·   **Linguistic and Cultural Links**: Some scholars associate the script with proto-Dravidian languages, indicating a historical connection between the IVC and South India.

·   The survival of the Brahui language in the Indus region and Dravidian influences in the Rigveda suggest linguistic continuity.

Historical Insights:

·   Deciphering the script could reveal details about trade, religious customs, and social hierarchy within the civilization.

· It may also establish connections between the IVC and other ancient societies such as Mesopotamia and Egypt.

Key Findings from Recent Studies

Tamil Nadu Research on Symbolic Patterns:

· A study by the Tamil Nadu State Department of Archaeology (TNSDA) found that 90% of pottery graffiti in Tamil Nadu shares similarities with the Indus script.

· These symbols were classified into 42 base signs, 544 variations, and 1,521 composite forms, suggesting their evolution from Indus symbols.

Theory of Cultural Exchange:

· Similarities in inscriptions imply possible interactions between the Indus Valley and South India during the Copper and Iron Ages.

· The presence of carnelian and agate beads, along with high-tin bronze artefacts in South Indian burial sites, supports evidence of trade.

Distinguishing Graffiti from Script:

The study differentiates between graffiti found on pottery and inscriptions on seals or other objects, though both may have a common origin.

The Dravidian Hypothesis

· This theory proposes that the Indus script represents an early Dravidian language, based on:

· Structural similarities between the Indus script and Dravidian linguistic patterns, such as suffix-based grammar.

· The influence of Dravidian substratum on Prakrit and Indo-Aryan dialects.

· However, while linguistic evidence supports this hypothesis, further research is necessary for universal acceptance.

Challenges in Deciphering the Indus Script

· **Lack of Bilingual References:** Unlike the Rosetta Stone, which helped decode Egyptian hieroglyphs, no multilingual inscriptions exist to aid translation.

· **Limited Data:** Indus inscriptions are typically short, averaging four to five symbols, making it difficult to detect patterns.

· **Absence of Contextual Understanding**: Without a clear cultural or linguistic framework, assigning meaning to the symbols remains speculative.

Recent Initiatives and Collaborative Efforts

· International Conferences:

· Global events, such as the IVC centenary celebrations in Tamil Nadu, aim to bring together archaeologists, linguists, and computational experts.

· **Technological Approaches:** AI-based pattern analysis and computational linguistics are being used to decode the Indus script.

· **Comparative Studies:** Examining other undeciphered scripts, such as Rongorongo from Easter Island, may offer methodological insights.

Future Research Directions

· **Expanding Archaeological Excavations: Further** excavations in the Indus Valley and South India are essential for uncovering more inscriptions.

· **Scientific Analysis:** Radiocarbon dating and material analysis can help trace cultural exchanges.

· **Interdisciplinary Collaboration**: Cooperation among historians, archaeologists, linguists, and data scientists is vital for developing effective decoding strategies.

Recognizing Migrant Workers: Strengthening Social Protection

Context

India's Ministry of Labour and Employment (MoL&E) recently declared the e-Shram portal as the world's largest database of unorganized workers, with over 300 million registrations. Launched in May 2021 following the Supreme Court's directive, the portal aims to provide a national registry for migrant and informal sector workers, particularly in response to the vulnerabilities exposed during the COVID-19 pandemic. However, challenges in execution highlight the need for more comprehensive social security measures. **Historical Context and the Need for a Database**

·   The Interstate Migrant Workmen Act (1979) required contractors to maintain worker records.

·   The National Commission for Enterprises in the Unorganized Sector (2007) proposed universal registration.

·   The Unorganized Workers' Social Security Act (2008) suggested issuing worker identity cards.

·   Despite these policies, past efforts failed to gain momentum, leaving millions of workers outside the scope of formal social protection.
Understanding the Vulnerability of Migrant Workers

·   **Socio-Economic Exclusion:** Migrant workers lack job security, as most are employed informally in construction, agriculture, domestic work, and small-scale industries. Without formal contracts, they have minimal bargaining power and face exploitative conditions, including low wages and unsafe workplaces. The absence of labour unions exacerbates their vulnerability.

·   **Disenfranchisement:** Migrant workers often struggle to vote due to their transient nature. Many cannot register in their place of work, while their names may be removed from home-state electoral rolls. This political exclusion limits their ability to influence policies affecting their livelihoods.

·   **Restricted Access to Social Services:** Migrants face challenges in obtaining healthcare, education, housing, and social benefits. Welfare programs often lack portability, meaning workers lose access to ration cards or healthcare when they move. Their children frequently experience disruptions in education, reinforcing cycles of poverty.

- **Stigma and Discrimination:** Migrants are often seen as outsiders, leading to social exclusion and hostility. Women migrants face heightened risks of exploitation and harassment.

Key Challenges in Implementation

- **Documentation Barriers:** Many workers lack essential documents such as Aadhaar, voter IDs, or ration cards. Unlinked mobile numbers and inconsistent addresses further complicate registration.

- **Technological Limitations:** While e-Shram aims to simplify access, digital illiteracy and lack of smartphone/internet access hinder workers from registering independently. Women are disproportionately affected due to limited access to personal devices.

- **Limited Portability of Benefits**: Although initiatives like One Nation, One Ration Card (ONORC) aim to address mobility issues, many social welfare programs remain tied to a worker's home state.

- **Fragmented Social Security System**: Multiple welfare schemes operate under different ministries, leading to inefficiencies. The integration of major schemes such as PM Matru Vandana Yojana and Shramik Suraksha Yojana with the e-Shram portal remains incomplete.

The Path Forward

- The e-Shram portal should evolve beyond a registration tool into a comprehensive empowerment mechanism.

- Enhancing the portability of benefits, integrating real-time migration data, and linking human development indicators to policy design are crucial.

- Policymakers and civil society must shift perspectives, viewing migrant workers as contributors to economic growth rather than liabilities.

- The 2030 Sustainable Development Goals (SDGs) emphasize that mismanaged migration can impede overall development.

Conclusion

Migrant and unorganized workers are essential to India's economy yet remain underrepresented in social welfare planning. While e-Shram and OSS are steps in the right

direction, achieving Viksit Bharat (Developed India) requires inclusive, well-structured policies ensuring dignity, security, and equitable opportunities for this workforce.

Winter Char Dham: Expanding Uttarakhand's Pilgrimage Season

Why in the News?

On December 8, the Uttarakhand government launched the Winter Char Dham circuit to encourage tourism during the off-season months, ensuring year-round visitor engagement.
Char Dham: Sacred Sites in the Garhwal Himalayas

·   The Revered Char Dham Shrines , Situated in Uttarakhand's Garhwal region, the Char Dham includes Gangotri, Yamunotri, Kedarnath, and Badrinath.

.   These sites attract millions of pilgrims from May to November, playing a crucial role in the state's economy.

Winter Closures and Alternate Seats - Due to heavy snowfall, the shrines become inaccessible in winter and are closed for the season. During this period, the deities are relocated to winter seats at lower altitudes:

·   Gangotri → Mukhba (Uttarkashi)

·   Yamunotri → Kharsali (Uttarkashi)

·   Kedarnath → Omkareshwar Temple (Ukhimath, Rudraprayag)

·   Badrinath → Pandukeshwar (Chamoli)

·   Char Dham All-Weather Highway Project

Launched in 2016, this initiative aims to widen 889 km of hill roads, improving year-round accessibility to the four Char Dham shrines. The project enhances connectivity to Badrinath, Kedarnath, Gangotri, and Yamunotri, ensuring safer and more reliable travel for pilgrims.

- Promoting Winter Char Dham Tourism
- Encouraging Off-Season Travel
- The initiative seeks to sustain pilgrimage tourism during winter, increasing footfall beyond the traditional season.
- By December 30, 15,314 pilgrims had visited the winter shrines, with Omkareshwar Temple recording the highest attendance (6,482 visitors).
- Rebranding Uttarakhand as a Year-Round Destination
- Beyond a Summer Pilgrimage Spot: Tourists are encouraged to explore hidden gems around the winter sites.

'Sun Tourism' Initiative:

· Promoting Uttarakhand as a winter escape from North India's smoggy conditions, highlighting its clear skies and fresh air.

. Expected to stimulate economic growth and revitalize tourism during the off-season.

. Economic Importance of Char Dham Tourism

· The Char Dham pilgrimage contributes over ₹200 crore per day to Uttarakhand's economy during peak season.

· While winter tourism remains in its early stages, officials anticipate a steady rise in visitors.

Concerns and Challenges

· Overcrowding and Commercialization

· Uncontrolled visitor numbers may result in overcrowding, environmental harm, and excessive commercialization of sacred sites.

· Increased human activity can strain local infrastructure and fragile ecosystems, disrupting the sanctity of pilgrimage locations.

· **Impact on Wildlife ;** Increased winter tourism disturbs rare species such as snow leopards and mountain sheep, which migrate to lower altitudes in search of food. Human presence in ecologically sensitive areas may affect their natural behaviour.

· **Harsh Terrain and Safety Concerns :** The rugged landscape and severe winter weather pose risks to pilgrims' safety, security, and public health.

Recommendations and Way Forward

. Sustainable Pilgrimage Management

· A balanced approach is required to protect the environment while supporting religious tourism.
Effective planning and crowd control can help minimize adverse effects.
·

Assessing Carrying Capacity
·

· The National Green Tribunal (NGT) has directed Uttarakhand to evaluate how many pilgrims the Char Dham sites can accommodate sustainably.

· The Uttarakhand Pollution Control Board has partnered with the Wildlife Institute of India to conduct this study, with findings expected within a year.

·Bottom of Form

General Studies Paper II

Opportunity to Resolve Sri Lanka's Ethnic Conflict

Context
India's decision to name the Jaffna Cultural Centre after Tamil poet-philosopher Thiruvalluvar is a symbolic move highlighting its deep historical and cultural ties with Sri Lanka. This step not only acknowledges Tamil heritage but also serves as a diplomatic tool to strengthen India's influence, particularly among the Tamil-speaking population. However, beyond cultural significance, India-Sri Lanka relations have long been shaped by political complexities, especially concerning the Tamil issue and the implementation of the 13th Amendment (13A) to Sri Lanka's Constitution.
The 13th Amendment: Historical and Political Background

- India's involvement in Sri Lanka's Tamil issue dates back to the 1983 anti-Tamil violence, which led to its role as both a mediator and an active player in resolving the ethnic conflict.
- The Indo-Lanka Accord of 1987 resulted in the 13th Amendment, which introduced Provincial Councils with limited autonomy.
- The amendment has remained controversial, facing opposition from both Sinhalese nationalists and Tamil separatists.
- The Janatha Vimukthi Peramuna (JVP), the party of Sri Lankan President Anura Kumara Dissanayake, has historically opposed 13A, viewing it as an imposition by India.
- The Liberation Tigers of Tamil Eelam (LTTE), despite advocating Tamil autonomy, rejected 13A as insufficient.

India's Stance on the 13th Amendment

- Despite being introduced over 35 years ago, the full implementation of 13A remains incomplete, particularly in Tamil-majority regions.
- Indian governments have consistently urged Sri Lanka to implement 13A fully.
- However, Indian Prime Minister Narendra Modi's omission of a direct mention of 13A during Sri Lankan President Dissanayake's visit in December 2024 raised questions about a possible shift in India's stance.
- While Foreign Minister S. Jaishankar reiterated India's call for devolution, Modi's silence suggests India may be recalibrating its approach based on Sri Lanka's domestic politics.

Sri Lanka's Political Landscape and the Devolution Debate

- **JVP and NPP's Position on Devolution**
  - The JVP, a left-wing nationalist party, has historically opposed 13A, seeing it as a threat to Sri Lanka's sovereignty.
  - Now leading the National People's Power (NPP) coalition, the JVP has emerged as a dominant political force.
  - President Dissanayake has not clearly stated whether his government will fully implement 13A. During his 2024 election campaign in Jaffna, he avoided discussing power devolution, raising concerns that Tamil autonomy may not be a priority.
- **Ambiguity in the NPP's Constitutional Commitments**

○ The NPP's 2024 manifesto pledged a new constitution ensuring democracy and equality but did not explicitly promise greater autonomy for Tamil-majority regions.

○ Instead, it proposed decentralized governance at local, district, and provincial levels, suggesting a broad but vague approach to devolution.

○ The manifesto also committed to holding provincial and local elections within a year, yet it remains unclear whether these elections will lead to meaningful devolution.

● **The Risk of Strengthening Local Government at the Expense of Provincial Councils**

○ A key concern is whether the government will prioritize strengthening local government institutions while sidelining provincial councils.

○ Local bodies, such as municipal and district councils, have existed longer than provincial councils and handle grassroots governance.

○ However, they lack the financial and administrative power to address larger regional challenges, particularly in post-war Tamil-majority areas.

○ Tamil leaders fear that prioritizing local governance over provincial councils would dilute their push for meaningful autonomy.

● **The Influence of Sinhalese Nationalism on the Devolution Debate**

○ Many Sinhalese nationalist groups oppose granting greater autonomy to Tamil-majority areas, fearing it could lead to separatism.

○ This sentiment has historically influenced government policies, leading to reluctance to implement devolution measures, despite repeated Indian diplomatic efforts.

The Way Forward: Towards a Lasting Solution

● For long-term stability and reconciliation, Sri Lanka's leadership must recognize that Provincial Councils are not merely an Indian imposition but a result of its own political evolution.

● Sri Lanka's constitutional framework has drawn from various global models, including British, American, and French systems.

● Dismissing 13A as an external imposition ignores its potential to provide a democratic solution to the ethnic conflict.

● With a strong parliamentary majority and a popular president, the NPP has a unique opportunity to enact meaningful reforms.

● A balanced approach, respecting Tamil aspirations while preserving national unity is essential.

● Fully implementing 13A, including holding long-overdue provincial council elections, would help address Tamil grievances and reinforce Sri Lanka's democratic standing.

Conclusion

India's decision to rename the Jaffna Cultural Centre after Thiruvalluvar reflects its commitment to cultural diplomacy and its deep ties with Sri Lanka. However, the fundamental issue of Tamil political rights remains unresolved. Despite its shortcomings, the 13th Amendment remains the most viable framework for addressing Tamil aspirations within a united Sri Lanka. While India's stance may be evolving, Sri Lanka's leadership must recognize that meaningful devolution is not just a diplomatic obligation but a necessity for national unity and long-term stability.

India-China Diplomatic Thaw

Why in the News?

India and China have taken key steps to improve bilateral ties, including resuming the Kailash Mansarovar Yatra this summer, reinstating direct flights, issuing visas for journalists and think tanks, and sharing transborder river data. These measures followed a meeting between India's Foreign Secretary Vikram Misri and Chinese officials.
Key Aspects of India-China Statements
Framing of the Meeting

● **India's Perspective:**
  ○ India emphasized a broad review of bilateral relations, prioritizing people-centric steps to stabilize and rebuild ties.
  ○ The Indian statement referenced previous commitments made by PM Modi and President Xi Jinping in Kazan, signalling a cautious and calculated approach.
● **China's Perspective:**
  ○ China framed the talks as centred on improving and developing relations, emphasizing that both sides had reached a consensus on specific measures.
  ○ The Chinese statement reflected a more optimistic tone, focusing on progress and future cooperation.

Kailash Mansarovar Yatra

- Both nations agreed on resuming the pilgrimage but with different emphases.
- India confirmed the yatra will resume in the summer of 2025, with discussions proceeding as per existing agreements.
- China, however, stated that the visit would be to the Xizang Autonomous Region and stressed that arrangements would be initiated "as soon as possible."

Direct Flights

- Both sides agreed in principle to resume direct flights but with differing points of focus.
- **India's View:** Highlighted the need for a new agreement and technical discussions to finalize an updated framework.
- **China's View:** Linked flight resumption with facilitating personnel movement and journalist exchanges.
- Before suspension in 2020 due to COVID-19 and the Galwan clash, 539 direct flights operated monthly between the two countries, accommodating over 1.25 lakh passengers.
- Currently, India has only one resident journalist in China, while China has none in India.

Transborder River Cooperation

- Both nations agreed to hold an early meeting of the **India-China Expert Level Mechanism** on transborder river issues, including hydrological data sharing.
- India raised concerns about China's ongoing construction of the world's largest dam on the Brahmaputra, approved in January.
- **India's Statement:** Focused on resuming hydrological data exchange and other cooperative measures.
- **China's Statement:** Stressed the importance of advancing transborder river cooperation and maintaining dialogue for an early expert-level meeting.

Analysis of India-China Approaches

India's Approach:

- Advocated a **step-by-step** strategy to address mutual concerns, particularly the border situation.
- Emphasized a gradual restoration of existing dialogues to address priorities through structured mechanisms.

China's Approach:

- Stressed a **long-term strategic** outlook, urging both nations to manage relations based on fundamental national interests.
- Highlighted the need to foster exchanges and practical cooperation while enhancing mutual trust and managing differences.
- Called for a **stable and constructive** approach to bilateral ties.

Trade Issues

- India raised concerns over **market access, policy transparency, and predictability** in economic and trade relations.
- The Chinese statement did not mention trade concerns, indicating a lack of discussion on this issue from their side.

Support for China's SCO Presidency

- China claimed that India pledged full support for China's **Shanghai Cooperation Organization (SCO) presidency** and would actively participate in SCO meetings.
- India's statement did not mention this, suggesting a possible divergence in views.

Diverging Perspectives on Relations

- China stressed the need to avoid **mutual suspicion, estrangement, and exhaustion** in bilateral relations.
- In contrast, India, as articulated by External Affairs Minister S. Jaishankar, underscored the principles of **mutual respect, mutual sensitivity, and mutual interests.**
- The variation in emphasis reflects broader differences in how both nations perceive and manage their relationship.

ASER (Rural) 2024 - Recovery and Progress in Foundational Learning

Context:

- The Annual Status of Education Report (ASER) 2024, conducted by NGO Pratham, is a nationwide rural household survey assessing children's schooling status and their fundamental reading and arithmetic skills.
- The survey categorizes findings into three age groups: Pre-primary (3-5 years), Elementary (6-14 years), and Older children (15-16 years).

● The results indicate a strong rebound from pandemic-induced learning setbacks and highlight the impact of recent educational reforms.

Key Findings:

Enrollment Trends:

● The overall school enrollment rate for children aged 6-14 remained high at 98.1% in 2024, similar to 98.4% in 2022.
● Pre-school enrollment (ages 3-5) increased significantly, particularly for 5-year-olds, rising from 58.5% in 2018 to 71.4% in 2024.

Recovery in Reading Skills:

● The percentage of Class III students reading at a Class II level has rebounded to 27.1% in 2024, up from 20.5% in 2022.
● Among Class V students, 48.7% can read a Class II text in 2024, nearing the 2018 level of 50.4%.

Progress in Arithmetic Skills:

● The share of Class III students able to perform basic subtraction rose to 33.7% in 2024, the highest in a decade.
● The percentage of Class V students who can solve division problems increased to 30.7% in 2024, exceeding the 2018 figure of 27.8%.

Digital Literacy Insights:

● ASER 2024 introduced a section on digital literacy, analyzing 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:

Enrollment and Learning Outcomes:

● Government school enrollment, which surged during the pandemic, has stabilized at 66.8% in 2024, compared to 65.6% in 2018 and 72.9% in 2022.
● In arithmetic, government schools saw a 36.6% improvement in subtraction skills for Class III students, compared to a 10.2% rise in private schools.

- The percentage of Class III students in government schools reading a Class II-level text increased from 16.3% in 2022 to 23.4% in 2024.

Factors Behind Improvement:

- The **National Education Policy (NEP) 2020** has prioritized foundational literacy and numeracy (FLN).
- The **Nipun Bharat Mission**, led by the Union Education Ministry, has been a key initiative for enhancing early education.

State-Wise Progress:

Recovery in the Low-Performing States:

- States like Uttar Pradesh, Bihar, Madhya Pradesh, and Tamil Nadu demonstrated significant learning improvements.
- In Uttar Pradesh, the percentage of Class III government school students reading at the Class II level jumped from 12.3% in 2018 to 27.9% in 2024.
- Bihar's Class III reading levels rose from 12.1% in 2018 to 20.1% in 2024, while arithmetic skills improved from 18% to 28.2%.

Gains in the High-Performing States:

- States like Himachal Pradesh, Maharashtra, Uttarakhand, Haryana, and Odisha saw a 10-percentage point rise in reading levels from 2022 to 2024.
- Uttarakhand recorded a sharp improvement in Class III reading levels from 24.7% in 2018 to 35.6% in 2024.

Conclusion:

- ASER 2024 not only highlights a recovery but also signals a transformative shift in foundational learning across India.
- NEP 2020 has established a unified goal for states, enabling them to implement customized FLN strategies.
- The findings underscore a national commitment to foundational literacy and numeracy, marking a milestone in India's education system.

Should Governors Serve as Chancellors of State Universities?

Historical Background

- The tradition of Governors acting as Chancellors of state universities in India originates from colonial policies.
- This system was introduced in 1857 with the establishment of universities in Calcutta, Bombay, and Madras to maintain British control over higher education.
- After independence, the practice continued without evaluating its relevance in a democratic and federal system.
- As Chancellors, Governors hold significant authority, including appointing Vice-Chancellors, nominating syndicate members, and approving university regulations.
- However, this role has frequently led to conflicts, particularly in states ruled by opposition parties.

Challenges of the Current System

- **Political Influence:** Since the late 1960s, Governors, once neutral figures, have increasingly been seen as political appointees. Studies show that between 1950 and 2015, 52% of Governors were active politicians, raising concerns about the role's credibility.
- **Administrative Conflicts:** Universities are accountable to both state governments and Governors, creating governance hurdles such as delays in appointments and decision-making.
- **Lack of Expertise:** Many Governors lack the academic background necessary to provide effective leadership in higher education, leading to opaque decision-making and political interference.
- **Undermining Federalism:** Granting centrally appointed Governors control over state-funded institutions weakens federal principles and reduces universities' accountability to state governments.

Recommendations from Commissions and Alternative Approaches

- **Commission Insights:**
  - **Sarkaria Commission (1983-88):** Recommended that Governors consult Chief Ministers on university matters.
  - **M. M. Punchhi Commission (2007-10):** Suggested separating the Governor's constitutional and statutory roles, advocating for academicians to be appointed as Chancellors instead.
- **Reform Models:**

- ○ **Ceremonial Role:** States like Gujarat, Karnataka, and Maharashtra have limited the Governor's role to a formal, advisory position under the guidance of the Council of Ministers.
- ○ **State-Appointed Chancellors:** Telangana and Kerala propose appointing distinguished academicians or public figures as Chancellors, though such reforms await Presidential approval.
- ○ **University-Elected Chancellors:** Some global institutions, such as Oxford and Melbourne, allow universities to elect their Chancellors, enhancing institutional autonomy and accountability.

The Need for Reform

- ● The colonial-era system of Governors serving as Chancellors must be reformed to uphold university autonomy, ensure academic excellence, and prevent political interference.
- ● Aligning university governance with international best practices would strengthen India's federal structure.
- ● States such as Tamil Nadu, Kerala, and West Bengal have proposed reforms, awaiting national-level decisions to move forward.

Conclusion

- ● Reforming the role of Governors as Chancellors is vital for transparent, accountable, and independent university governance.
- ● By adopting models that emphasize academic freedom and reduce political influence, India can create an education system that aligns with democratic values and global standards.

The Indo-Pacific and U.S. Strategy

Context

- ● Donald Trump's inauguration as the 47th President of the U.S. marks a significant political comeback, reshaping both domestic and international politics.
- ● A key focus of Trump's administration is the Indo-Pacific region, given its critical role in global trade, security, and stability.
- ● Understanding the Indo-Pacific's growing importance, past U.S. policies, and Trump's potential approach to the region is essential.

Trump's First Term and the Indo-Pacific

Reframing the Geopolitical Perspective

- Trump's administration expanded the concept of the "Indo-Pacific," shifting from the narrower "Asia-Pacific" framework to emphasize the strategic role of the Indian Ocean alongside East Asia.
- This shift signalled a commitment to countering China's influence in maritime and land-based domains.
- The Indo-Pacific strategy prioritized safeguarding crucial sea routes, addressing maritime security challenges, and maintaining a regional balance of power.

Institutional and Strategic Adjustments

- The renaming of the U.S. Pacific Command to the **U.S. Indo-Pacific Command (2018)** reinforced the region's strategic importance.
- The U.S. Department of Defense restructured its operations to focus more on Indo-Pacific partnerships, underscoring a long-term commitment to regional stability.

Revitalizing the Quad

- Trump's administration elevated the Quad (U.S., India, Japan, Australia) from informal discussions to high-level ministerial engagements.
- This alignment was driven by shared concerns over China's assertiveness in the South China Sea and the need for resilient supply chains.
- The Quad became a platform for cooperation on maritime security, technology, and rule-based governance.

The Indo-Pacific Strategy Under Biden

- **Continuity with Expanded Scope:** The Biden administration maintained the Indo-Pacific framework, broadening its focus to include vaccine distribution, climate action, and infrastructure development.
- **Indo-Pacific Economic Framework (IPEF):** Introduced in 2022, this initiative aimed to integrate economic strategies with security priorities.
- These efforts highlighted a bipartisan consensus on the Indo-Pacific's significance, laying a foundation for potential future policies under Trump's second term.

Trump's Potential Second-Term Strategy in the Indo-Pacific

Countering China's Influence

- Trump's administration views China as not only a regional competitor but also a global challenger to U.S. dominance.
- Secretary of State Marco Rubio's remarks have underscored a more aggressive stance against Beijing.
- Measures could include expanded **freedom-of-navigation operations** in contested areas, increased sanctions against Chinese entities, and alternative infrastructure investments to counter China's Belt and Road Initiative.
- The U.S. is expected to strengthen alliances to deter any coercive Chinese actions.

Strengthening the Quad as a Pillar of Stability

- The Quad is expected to remain central to Trump's Indo-Pacific approach.
- Future strategies may focus on joint military exercises, intelligence sharing, and enhanced maritime security coordination.
- Efforts to institutionalize the Quad further—through **regular leadership summits**—will be a priority.

Deepening Defense Partnerships

- Trump's Indo-Pacific policy will likely emphasize expanded defence collaborations with allies like India, Japan, and Australia.
- Initiatives may include **technology transfers, co-production agreements, and joint exercises.**
- The U.S. may also explore **trilateral and multilateral defence partnerships** with Southeast Asian nations such as Vietnam, the Philippines, and Indonesia.

Advancing Economic and Technological Alliances

- Economic security will be a key component of Trump's Indo-Pacific vision.
- The administration is expected to **promote resilient supply chains,** reducing dependency on China, especially in critical sectors like **semiconductors, pharmaceuticals, and rare minerals.**
- **Technological cooperation**—including 5G, artificial intelligence, and advanced manufacturing—will be emphasized to ensure that democratic standards shape innovation.

Balancing Hard Power with Broader Agendas

- While military strategies will dominate, Trump's administration may continue supporting initiatives on **climate change, vaccine distribution, and infrastructure development.**
- Such efforts, however, will likely be pursued through bilateral or multilateral agreements that prioritize U.S. leadership and counter China's influence.

Conclusion

- A second Trump term is expected to reinforce the Indo-Pacific's role in U.S. foreign policy and global geopolitics.
- By expanding on prior policies and leveraging bipartisan support, Trump's administration will likely adopt a more assertive approach toward China while deepening cooperation with Quad partners.
- As the Indo-Pacific remains central to **21st-century geopolitics,** the U.S.'s evolving role under Trump will significantly impact regional stability and global dynamics.

Constitutional Justice and Personal Liberty at 75

Context

As India celebrates 75 years of its Constitution, it is crucial to not only acknowledge its achievements but also address the challenges threatening its core principles. The Constitution, originally envisioned as a guiding force for justice, equality, and liberty, now faces significant ethical and moral dilemmas. This milestone presents an opportunity to reflect on historical and present struggles for personal liberty, particularly focusing on the importance of dissent as a constitutional value and the judiciary's role in upholding justice.

Dissent as a Pillar of Constitutional Ethics

- **Essential for Democracy**: Dissent is fundamental to democracy, fostering free expression and constructive critique necessary for societal progress. In India's constitutional framework, it is not just a right but a vital safeguard against excessive state power.
- **Judicial Perspective**: The Supreme Court's evolving interpretation of dissent through landmark rulings highlights its importance in preserving constitutional morality.

Key Cases Defining Dissent

- **A.K. Gopalan vs. State of Madras (1950)**: This case tested the Constitution's commitment to personal liberty. The majority ruling upheld preventive detention with a narrow interpretation of fundamental rights. However, Justice S. Fazl Ali's dissenting opinion advocated for a more integrated approach, emphasizing liberty's inseparability from justice and dignity. Although overlooked at the time, his perspective later influenced future legal interpretations. **Puttaswamy vs. Union of India (2017)**: This
- landmark judgment reaffirmed the right to privacy and recognized Justice Fazl Ali's dissent, correcting earlier judicial limitations on liberty. This marked a shift toward a broader, justice-oriented constitutional interpretation. **Role in Preventing State Overreach**: Dissent acts as a check on centralized power, ensuring diverse
- perspectives are acknowledged, in line with B.R. Ambedkar's vision of a Constitution that accommodates differing viewpoints.

Beyond Judicial Rulings

- **Institutional Commitment**: The protection of dissent requires active efforts from all branches of government and civil society. The Constitution's Preamble—emphasizing justice, liberty, equality, and fraternity—serves as a moral guide, ensuring dissent is not criminalized or repressed.

The Paradox of Dissent in Contemporary India

- **Judicial Recognition vs. Criminalization** : Despite the judicial acknowledgement of dissent as a constitutional value, recent years have seen increased suppression through preventive detention, arbitrary arrests, and denial of fair trials.
- **Historical Parallels**: Activists like Umar Khalid, Sharjeel Imam, and Gulfisha Fatima, imprisoned for protesting the Citizenship (Amendment) Act, echo the struggles faced by A.K. Gopalan under colonial and post-independence laws. Ironically, laws originally meant to sustain colonial rule are now used to stifle dissent in independent India.
- **The Legal Process as Punishment**: The idea that "the process itself becomes the punishment" aptly describes the plight of contemporary dissenters.

The Judiciary's Role in Constitutional Governance

- **Ethical Responsibility**: The judiciary, as the guardian of constitutional values, must actively safeguard personal liberty and dissent. While the Supreme Court has upheld these principles in cases like Puttaswamy, its reluctance to grant bail to dissenters,

defer crucial hearings, and validate vague anti-terror laws creates an environment of impunity.
- **Learning from History**: K.G. Kannabiran's critique of the Gopalan judgment as an "Indian-made foreign judgment" underscores how colonial-era legal frameworks continue to shape India's judicial approach. Seventy-five years later, the judiciary has an opportunity to correct this legacy by ensuring laws promote justice rather than state control.
- **Justice as the Constitution's Ultimate Goal**: True constitutional interpretation should prioritize human dignity and liberty over procedural technicalities. By adopting a more justice-oriented approach, the judiciary can ensure the Constitution remains a transformative force for democracy.

The Path Forward: Embracing Creative Constitutionalism

- **Expanding Fundamental Rights**: Courts must interpret constitutional provisions in a manner that upholds justice and safeguards individual freedoms.
- **Reforming Laws**: Preventive detention laws and anti-terror statutes must not be misused to suppress dissent or target marginalized communities.
- **Urgency in Liberty Cases**: The judiciary must act swiftly in matters concerning personal liberty, recognizing that delayed justice is effectively denied justice.

Conclusion

India's Constitution embodies a vision of justice, equality, and liberty. However, these ideals remain unfulfilled as long as dissent is criminalized and personal freedoms are undermined. The struggles of past and present dissenters highlight the ongoing journey toward constitutional justice. By embracing creative constitutionalism and prioritizing individual dignity, India can move closer to realizing the full potential of its Constitution.

India-Indonesia Bilateral Relationship

Why in the News?

Indonesian President Prabowo Subianto arrived in India as the chief guest for the 76th Republic Day celebrations in New Delhi.
Historical and Cultural Ties

- **Centuries-Old Connection**: India and Indonesia share a relationship spanning over two millennia, shaped by cultural and historical exchanges.
- **Religious and Literary Influence**: Hinduism, Buddhism, and later Islam spread from India to Indonesia, significantly influencing its cultural landscape. The epics *Ramayana* and *Mahabharata* continue to shape Indonesian art and traditions.
- **Post-Independence Solidarity**: Both nations, after gaining independence, pursued political sovereignty, economic self-sufficiency, and independent foreign policies, emerging as key voices in the Non-Aligned Movement.

Strategic and Diplomatic Engagements

- **High-Level Exchanges**:
  - **2018**: Prime Minister Narendra Modi's visit to Jakarta resulted in the signing of a Comprehensive Strategic Partnership and a shared vision for Indo-Pacific maritime cooperation.
  - **2024**: Modi and President Prabowo Subianto discussed economic and security collaboration on the sidelines of the G20 Summit, reaffirming their commitment to regional stability and economic growth.

Defence and Security Cooperation

- **Longstanding Military Ties** : India and Indonesia formalized their defence relationship in 1951, strengthening it through agreements in 2001 and 2018.
- **Key Initiatives**:
  - Joint military exercises, including *Garuda Shakti* (Army), *Samudra Shakti* (Navy), and **IND-INDO CORPAT** (Coordinated Patrols).
  - The 2024 India-Indonesia Defense Industry Exhibition showcased opportunities for collaboration in defence technology and manufacturing.

Economic and Trade Relations

- **Trade Partnership**: Indonesia is India's second-largest trading partner in ASEAN.
- **Trade Volume (2023-24)** : $29.4 billion, with key exports and imports including:
  - **Indian Imports** : Coal, crude palm oil, rubber.
  - **Indian Exports**: Refined petroleum, telecommunications equipment, and agricultural products.
- **Investment and Connectivity** :
  - Indian businesses have invested over $1.56 billion in Indonesia across sectors like mining, textiles, and infrastructure.

○ Direct flights between major cities such as Mumbai-Jakarta and Delhi-Bali have enhanced people-to-people ties and tourism.

Cultural and Educational Collaboration

● **Promoting Indian Culture** : India operates two cultural centres in Jakarta and Bali, fostering interest in yoga, classical dance, and music.
● **Educational Initiatives**: Indonesia benefits from Indian scholarships under programs like ITEC and ICCR, with ongoing discussions on educational MoUs for deeper academic collaboration.

Multilateral Cooperation

● **Active Participation in Global Forums** : Both nations engage in the G20, ASEAN, and IORA, working together on maritime security, sustainable development, and regional stability.

Future Prospects

● **Marking 75 Years of Diplomatic Relations (2024)** : The milestone is being celebrated with various initiatives, strengthening historical ties and future collaboration.
● **Expanding Cooperation**: Trade, defence, and cultural exchanges remain central to the partnership, ensuring mutual economic growth and security in the Indo-Pacific.

Conclusion

India and Indonesia's bilateral relationship reflects a blend of historical camaraderie and strategic collaboration. As two vibrant democracies and emerging economies, their partnership plays a crucial role in shaping regional and global dynamics. With shared values and mutual respect, both nations continue to deepen their engagement for a stable and prosperous future.

U.S. Exit from WHO: Impact on Global Health

Why is this in the News?

On his first day in office, President Donald Trump signed an executive order to withdraw the United States from the World Health Organization (WHO).

What Does the Article Cover?

● **Background** (Context and history of the decision)
● **Details of the Withdrawal** (Reasons, implications, consequences for the U.S., and challenges for WHO)

Background

● President Trump issued an executive order pulling the U.S. out of the WHO.
● This is his second attempt at leaving the organization, citing concerns over WHO's handling of COVID-19, alleged political bias, and financial burden on the U.S.
● In 2020, Trump initially announced the withdrawal, but President Joe Biden reversed it in 2021.
● The latest decision reignites debates about the U.S.'s role in global health diplomacy and multilateral cooperation.

Key Reasons for the Withdrawal

● **COVID-19 Response Issues** : Trump criticized WHO's slow reaction and its handling of China's accountability in the early pandemic stages.
● **Perceived Political Influence**: The administration accused WHO of being unduly swayed by some member states, particularly China.
● **Financial Concerns**:
    ○ The U.S. is the largest contributor, paying $100–122 million annually and nearly $1.3 billion in voluntary funding (2022–2023).
    ○ Trump argued this was unfair, given China's much lower contributions.

Immediate Steps Outlined in the Executive Order

● **Funding Halt**: Immediate suspension of financial contributions.
● **Personnel Withdrawal**: Removal of U.S. representatives from WHO.
● **Alternative Partnerships**: Identifying domestic and international substitutes for WHO's role.
● **Exit from Pandemic Treaty**: The U.S. would discontinue discussions on WHO's pandemic treaty aimed at improving global response mechanisms.

Implications of the Withdrawal

● **Financial Struggles for WHO**:

○ The U.S. provides about 20% of the WHO's budget, and losing this support could severely impact health programs, including vaccine development, disease eradication, and pandemic preparedness.
● **Disruptions in Global Health Programs**:
  ○ WHO supports immunization and disease surveillance in many nations, including India. A funding shortfall could undermine these efforts, especially in resource-poor regions.
● **Loss of Expertise**:
  ○ U.S. institutions like the CDC play a crucial role in global health research and response. Their absence could weaken WHO's effectiveness.

Domestic Consequences for the U.S.

● **Restricted Access to Global Health Data** :
  ○ The U.S. may lose critical information on emerging infectious diseases, increasing vulnerability to future health threats.
● **Vaccine Development Challenges**:
  ○ The U.S. depends on WHO's influenza strain data to create vaccines. A lack of access could lead to ineffective vaccines and higher disease-related deaths.
● **Diminished Influence in Global Health Policy**:
  ○ With the U.S. stepping back, other nations, such as China, could gain more control over global health decision-making, reducing American diplomatic leverage.

Geopolitical Impact and Emerging Players

● The U.S. departure could open doors for China and developing nations, including India, to expand their influence.
● China has already pledged an additional $30 million to WHO, strengthening its role in global health governance.
● This shift presents an opportunity for India to lead in vaccine production and represent the Global South in shaping a more balanced global health framework.

Challenges for WHO

● WHO faces internal criticism for sluggish crisis response and bureaucratic inefficiencies.
● While the loss of U.S. funding could worsen these issues, experts argue that engagement and reform—not withdrawal—are the best paths forward.

Possible Solutions

- **Legal Review**: Some experts question whether Trump can unilaterally withdraw from WHO without Congressional approval.
- **WHO Reforms**: Calls for greater efficiency, transparency, and improved emergency response mechanisms.
- **Collaboration with Emerging Economies**: Countries like India and South Africa could step up to fill the financial and strategic void left by the U.S. exit.

Trump 2.0: Challenges for India

Why is this in the News?
In his second inaugural address, President Donald Trump declared a "common sense revolution," vowing to dismantle liberal policies, address domestic and global crises, and implement significant changes in immigration, trade, free speech, and environmental regulations.

Overview of India-U.S. Relations

Historical Background

- **Prime Minister Vajpayee** : Referred to India and the U.S. as "natural allies."
- **President Obama** : Described India-U.S. ties as a defining relationship of the 21st century.
- **Prime Minister Modi** : Stated in 2016 that past hesitations had been overcome to forge a lasting partnership.

Economic & Trade Relations

- The U.S. is India's largest export market.
- U.S. Foreign Direct Investment (FDI) in India reached $51.6 billion in 2022.
- Seven pending trade disputes between the two nations have been resolved, improving bilateral trade.

Technological & Strategic Cooperation

- Collaboration in **blockchain, clean energy, cybersecurity, and space exploration**.

- Joint efforts in **health security and agriculture**.
- India's **Strategic Trade Authorization Tier 1** status (since 2018) allows it easier access to U.S. defence technologies.

India-U.S. Relations Under Trump's First Term

- Strengthened personal ties between Trump and Modi.
- Key developments:
  - Reviving the **Quad alliance**.
  - Renaming **U.S. Pacific Command** to **U.S. Indo-Pacific Command**.
  - Acknowledging India as a key strategic player in the Indo-Pacific.

Trump's Second Term Agenda

- **Economic Revival & Energy Independence** :
  - Plans to reduce inflation, expand oil drilling, and roll back climate policies.
- **Foreign Policy Strategy**:
  - Rejecting isolationism while prioritizing U.S. border security over foreign conflicts.
  - Aiming for global dominance while focusing on American strategic interests.

Challenges for India

- Trump's **transactional approach** could lead to tougher trade negotiations and policy shifts.
- Indian markets remain **cautious**, with investors adopting a "wait and watch" approach.
- **Potential Market Impacts** :
  - Possible **tax cuts** in Trump's budget could influence market trends.
  - **Tariff hikes** on China may benefit India indirectly.
  - **Rupee-dollar fluctuations** will be key to monitoring economic shifts.

India's Strategic Autonomy

- While India values U.S. support, it seeks to maintain **independent foreign policy decisions**.
- Balancing ties with the U.S. while managing relations with **Russia and regional security dynamics**.
- India will likely continue **Quad engagements** but with a pragmatic approach to U.S. expectations.

A Democratic Alliance with India at its Core
Context

The year 2024 was pivotal for global democracy, with elections worldwide setting the stage for 2025 as a year of strategic realignment.

- ● Europe and India, despite strong diplomatic ties, have struggled to achieve concrete outcomes.
- ● Both sides must shift from rhetoric to **practical collaboration in trade, security, and technology**.

Strengthening EU-India Relations

- ● **Beyond Trade Talks**:
  - ○ For nearly two decades, negotiations on a **Free Trade Agreement (FTA)** have been slow.
  - ○ While an FTA could be transformative, the focus should expand to **defence, economic security, and emerging technologies**.
- ● **Geopolitical Considerations**:
  - ○ Europe has been wary of India's ties with **Russia and China**, especially post-Ukraine invasion.
  - ○ However, India's approach is **pragmatic**, aiming to stay independent from the West-vs-China power struggle.

The Path Forward

- ● India and the EU must **prioritize shared interests over political differences**.
- ● The partnership should evolve beyond trade, focusing on **economic resilience, security, and technological leadership**.

The Collegium System and Its Evolving Landscape: Is It Too Soon to Judge?

Context

Recent discussions surrounding India's Supreme Court Collegium system have reignited debates over its effectiveness and the need for reform. Two key decisions have brought this issue to the forefront: the Collegium's move to introduce interviews for High Court judge

candidates and its plan to restrict appointments of individuals with close family ties to sitting judges. While these initiatives are commendable, they must be evaluated in the broader context of the longstanding concerns about the Collegium's transparency, structure, and interactions with the executive.

Origins of the Collegium System

The Collegium system was not established by the Constitution but evolved through judicial interpretations. Designed to protect judicial independence, it emerged from the Second Judges Case (1993), in which the Supreme Court interpreted "consultation" in Article 124 to mean "concurrence" by a Collegium composed of the Chief Justice of India (CJI) and senior judges. This ruling was intended to shield judicial appointments from excessive executive influence, ensuring the judiciary's autonomy.

Challenges to the Collegium's Effectiveness
Lack of Transparency

- The decision-making process remains confidential, with no official records or publicly available minutes.
- This secrecy erodes public trust and fosters concerns about favouritism, nepotism, and bias.
- The absence of clear selection criteria adds to the opacity, making the process susceptible to subjectivity and inconsistency.

Executive Interference and Delays

- Despite the judiciary's lead role in appointments, the executive retains significant power to delay or block Collegium recommendations.
- The government can indefinitely withhold decisions on appointments, neither approving nor rejecting them, leading to judicial inefficiencies.
- Selective acceptance of recommendations without clear reasoning further disrupts the process.

Nepotism and Lack of Diversity

- Critics argue that judges often favour candidates with family or professional ties to the judiciary, limiting opportunities for others.
- This practice prevents a judiciary that reflects the diversity of Indian society.

- While the Collegium's recent decision to limit nepotism is a positive step, its enforcement remains uncertain.
- A rigid exclusion of candidates based solely on familial connections may also disqualify highly qualified individuals, necessitating a more nuanced approach.

Absence of a Formal Framework

- The Collegium functions without a structured set of binding rules, relying instead on informal traditions.
- This lack of standardization leads to inconsistent practices across different CJIs.
- The system's unpredictability makes it vulnerable to manipulation and undermines confidence in its fairness.

Reform Efforts and Judicial Rulings

- The National Judicial Appointments Commission (NJAC) Act, 2014, was introduced to replace the Collegium system with a structured commission for judicial appointments and transfers.
- The Act sought to enhance transparency and accountability in the appointment process.
- However, in a 4:1 majority decision, the Supreme Court struck down the NJAC Act and the 99th Constitutional Amendment as unconstitutional, reinstating the Collegium system in favour of judicial independence.

Proposed Reforms to Improve the Collegium System

Candidate Interviews

- Introducing interviews for High Court candidates allows for a more comprehensive evaluation.
- Interviews can assess judicial temperament, ethical standards, and constitutional understanding, ensuring merit-based selections.

Reducing Nepotism

- Discouraging the selection of candidates with close family ties to serving judges could enhance diversity and meritocracy.
- This reform may break entrenched power structures and increase representation for first-generation lawyers and marginalized communities.

Codifying the Collegium Process

- Establishing clear guidelines on eligibility, selection criteria, and timelines can reduce ambiguities and discretionary decision-making.
- A codified structure would bring consistency and greater transparency.

Time-Bound Approvals

- Implementing fixed timelines for the government to act on Collegium recommendations would prevent undue delays.
- Mandatory deadlines for acceptance or rejection with clear reasons could help address judicial vacancies and reduce case backlogs.

Transparency Measures

- Public disclosure of selection and rejection justifications could bolster trust and accountability.
- Clarifying the rationale behind appointments would deter arbitrary decisions and unwarranted challenges.

Independent Oversight Mechanism

- An independent body could oversee Collegium recommendations, mediate disputes, and ensure adherence to constitutional principles.
- Such an entity could facilitate constructive resolution of conflicts between the judiciary and the executive.

The Path Forward for Effective Reforms

- **Inclusive Consultations**: Engaging senior judges, legal experts, and civil society in drafting formal rules.
- **Administrative Strengthening**: Enhancing the judiciary's capacity to manage reforms efficiently.
- **Legal Safeguards**: Introducing penalties for delays or procedural lapses.
- **Periodic Reviews**: Conduct regular assessments to refine and adapt the Collegium system as needed.

Conclusion

Despite the NJAC ruling, the Collegium system remains central to judicial appointments. While it upholds judicial independence, its long-term effectiveness hinges on meaningful reforms that address both structural and procedural flaws.

The Debate on Cash Transfers: Freebies or Strategic State Investment?

Cash transfer programs have long been integral to social protection policies worldwide, aiming to tackle issues like poverty, healthcare access, and education. India's **National Social Assistance Programme (NSAP)**, one of the earliest such initiatives, provides pensions to vulnerable groups, including the elderly, widowed, and disabled.

However, cash transfers have increasingly shifted from targeted social safety measures to political instruments, often presented as catch-all solutions for various socio-economic challenges. While these schemes have gained traction among political parties, their effectiveness in addressing fundamental issues remains debatable.
The Growing Role of Cash Transfers in Indian Politics In recent years, political parties have increasingly leveraged cash transfer schemes to bolster electoral prospects.

● **State-Level Success Stories**: Governments in Maharashtra and Jharkhand used cash transfers to appeal to women voters, contributing significantly to their re-election.
● **Agricultural and Rural Focus**: Telangana and Odisha implemented cash transfer schemes to mitigate agrarian distress, an approach later expanded at the national level through the **PM-KISAN** scheme in 2019.
● **Unemployment Benefits**: Some states have introduced direct financial assistance for the unemployed, further broadening the scope of such schemes.

Cash transfers are particularly appealing due to their **simplicity and immediate impact**. The expansion of financial inclusion has facilitated their implementation, allowing direct, hassle-free payments to beneficiaries. Additionally, their flexibility makes them attractive, as recipients can use the funds according to their needs. From a political standpoint, these schemes create a **direct connection** with voters, enhancing electoral appeal.

Criticisms of Cash Transfers: Flawed Assumptions

1. Do Cash Transfers Address Root Problems?

● Direct financial aid is often viewed as a solution for poverty, unemployment, and rural distress.
● However, these issues are **multi-dimensional**. For instance, poverty is influenced by education, healthcare, and infrastructure, while agrarian distress stems from outdated farming practices, market fluctuations, and policy gaps.
● While cash transfers offer temporary relief, they fail to address **structural challenges**.

2. Are Universal Cash Transfers Effective?

● The assumption that unconditional and universal transfers meet diverse needs is problematic.
● **Example**: A farmer receiving cash under an agrarian distress scheme may prioritize household expenses over investing in agricultural improvements.
● **Similarly**, unemployed youth may use funds for immediate consumption rather than for skill development or entrepreneurship.

3. Do Cash Transfers Eliminate Bureaucratic Challenges?

● While direct transfers bypass intermediaries, implementation issues persist.
● **Exclusion errors** (leaving out eligible beneficiaries) and **inclusion errors** (benefits reaching ineligible individuals) are common.
● Dependence on financial infrastructure and digital literacy also **excludes marginalized populations**, particularly in rural areas with limited banking access.

4. Does Political Popularity Indicate Policy Success?

● The electoral success of cash transfers does not necessarily translate to **long-term economic or social benefits**.
● Political parties often prioritize short-term popularity over assessing improvements in **human development, economic growth, or social equity**.

Arguments in Favor of Cash Transfers

1. Empowering Women Through Direct Financial Assistance

● India ranks **129th out of 146 countries** in the 2023 Global Gender Gap Report.
● Direct cash transfers have been instrumental in enhancing women's financial independence, particularly in states where women are primary beneficiaries of welfare schemes.

2. Strengthening Rural Economies

● Cash transfers help **increase consumption** in rural areas, stimulating local economies.
● **Example**: PM-KISAN has provided financial support to small and marginal farmers, boosting agricultural spending.

3. Addressing Short-Term Economic Distress

● During economic crises (e.g., COVID-19 lockdowns), cash transfers have provided **immediate relief** to vulnerable populations.
● Such schemes can act as **temporary economic stabilizers** in times of distress.

The Way Forward

Rather than dismissing cash transfers as mere freebies, governments should adopt a **balanced approach**, integrating them with long-term **infrastructure development, education, and skill-building initiatives**. Reforms should focus on **targeted implementation, minimizing leakages, and linking transfers with broader development goals** to ensure sustainability and economic resilience.

Addressing Delimitation Challenges Amid Population Control Policies

Context

● The Chief Ministers of Andhra Pradesh and Tamil Nadu have raised concerns over the proposed delimitation process, which may reduce parliamentary representation for southern states. This issue stems from the **South's demographic transition**,
● where lower fertility rates contrast with higher population growth in northern states. The debate highlights the challenges of balancing **political representation with**
● **demographic shifts** while considering the broader implications of fertility policies.

Fertility Transition and Its Impact on Political Representation
1. Demographic Success and Political Consequences

- Southern states like Andhra Pradesh and Tamil Nadu have effectively implemented **family planning initiatives**, resulting in lower fertility rates.
- However, this success may lead to **fewer parliamentary seats** due to the delimitation exercise, which adjusts representation based on population size.
- This creates a **conflict between India's federal structure and demographic realities**, where states that stabilize their population could lose political influence.

2. Political Leaders' Perspectives

- Leaders such as **Chandrababu Naidu and M.K. Stalin** have expressed concerns about this issue.
- Naidu suggested reconsidering policies that encourage larger families, while Stalin humorously proposed increasing birth rates to retain political power.
- Their remarks emphasize the **complexity and contradictions** of using fertility rates to determine political representation.

Global Lessons on Fertility Regulation

- Countries like **China** face long-term challenges due to strict fertility policies, including **an ageing population and a gender imbalance**.
- **Japan and South Korea**, despite offering incentives to increase birth rates, have struggled to reverse declining fertility trends.
- These examples suggest that **once demographic transitions occur, they are difficult to reverse**, making policy interventions ineffective.
- India must **avoid quick-fix solutions** that may disrupt its natural demographic and economic balance.

Demographic Disparities: Challenges and Implications
1. The North-South Population Divide

- Southern states (Tamil Nadu, Andhra Pradesh, Kerala, Karnataka) have **low fertility rates, high literacy, better healthcare, and strong economic growth** due to proactive governance.
- In contrast, **northern states (Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan)** continue to experience **high fertility rates and slower socio-economic development**.
- This has led to **population imbalances**, with northern states contributing more to India's total population growth.

2. Unequal Political Representation

- If parliamentary seats are allocated **solely based on population size**, northern states will gain more representation, while southern states may **lose seats despite their economic and social progress**.
- This creates a paradox where **states that successfully control population growth are penalized**, while those with higher birth rates gain political leverage.

3. Federal Equity Concerns

- Southern states **contribute more to India's GDP** and have a **lower dependency burden**, yet they risk losing political influence.
- This could lead to **regional alienation** and weaken India's cooperative federal structure.
- A key question emerges: **Should representation be based only on population, or should development and economic contributions also be considered?**

4. Gender Considerations

- Policies encouraging higher birth rates place **a disproportionate burden on women**, affecting their **health, careers, and economic independence**.
- Any attempt to increase fertility rates must include **comprehensive social support** like childcare, healthcare, and compensation for women's reproductive responsibilities.

Potential Solutions for Equitable Representation

1. Weighted Representation

- Representation can be based not only on population but also on **development indicators like literacy, healthcare, and economic output**.
- This ensures that states are **rewarded for progress rather than penalized for population control**.

2. Reforming Delimitation Criteria

- Parliamentary seat allocation should consider **demographic and socio-economic factors**, not just population numbers.
- States that have achieved **population stability** could be given **a baseline level of representation** to prevent unfair reductions in parliamentary seats.

3. Encouraging Inter-Regional Migration

- Increased **labour mobility between northern and southern states** could balance population density and promote economic integration.

4. Fiscal Incentives for Development

- The government could introduce **financial incentives** for states investing in **education, family planning, and healthcare**.
- This would help **reduce long-term demographic disparities** and promote balanced growth.

The Way Forward: Strengthening Federalism with Equity

1. Maintaining Unity Amid Regional Disparities

- The delimitation debate is not just about representation but also about **India's federal unity and fairness**.
- While northern states argue for representation based on population, southern states seek **acknowledgement of their developmental efforts**.
- A **balanced approach** is necessary to accommodate both perspectives.

2. Adapting India's Federal Model

- India's **federal system must evolve** to recognize regional disparities while maintaining national unity.

● Proactively addressing these concerns will **strengthen inter-state trust and cooperation**.

Conclusion

● The **tension between fertility rates and political representation** reflects broader challenges in managing India's demographic shift.
● A **fair and sustainable governance model** must prioritize **equity, economic contributions, and gender justice** over population size alone.
● The focus should **shift from reversing fertility trends to creating an inclusive, development-driven representation system** that values all states equally.

General Studies III

1. Mahakumbh Stampede: Causes and Prevention Strategies

Why in the News?
A tragic stampede at the Mahakumbh Mela in Allahabad on January 29 led to multiple casualties. The Uttar Pradesh Chief Minister attributed the incident to an overwhelming crowd gathered for Mauni Amavasya. A 2014 report by the National Disaster Management Authority (NDMA) on crowd management at large events highlighted that most crowd-related disasters in India and developing countries occur at religious sites.

Causes of Stampedes

Stampedes can arise from various factors, including:

● **Structural Deficiencies**: Weak barricades, fragile guardrails, narrow exits, and insufficient lighting.
● **Technical Failures**: Fire or electrical malfunctions.
● **Poor Crowd Management**: Lack of coordination among authorities and inadequate planning.

Failures in Crowd Control

The NDMA report identifies key reasons for crowd mismanagement, such as:

● Underestimating expected crowd size.

- Exceeding venue capacity.
- Insufficient holding areas before entry.
- Locked or blocked exits.
- Inadequate railings and queue management.
- Absence of partitions to regulate movement.

Consequences of Poor Management

Lack of proper arrangements can lead to panic, overcrowding, and rapid movement, causing:

- Crushing and suffocation.
- Trampling incidents.
- Fatalities, often due to **compressive asphyxia**.

Role of Crowd Behavior in Stampedes

Understanding crowd dynamics is essential for preventing disasters. A few individuals' actions can trigger panic, leading to chaos. A **community-based** approach to crowd management is more effective than force-driven methods.

Impact of Overcrowding

Overcrowding occurs when demand surpasses available space. Measures to regulate entry, such as **mandatory registration**, can help prevent congestion.

Risks of Poor Crowd Management

- Long wait times may provoke people to climb fences, causing bottlenecks.
- Police actions, like chasing unruly groups, may push crowds into each other, worsening the situation.

Past Stampede Incidents

The NDMA report references several past tragedies:

- **Nashik Kumbh (2003)**: Overcrowding at barricades and sudden crowd reversals led to 29 deaths.
- **Kalubai Yatra (2005)**: Due to poor planning and unsafe infrastructure, 293 people lost their lives.

Causes Identified in Investigations

- **Nashik Kumbh**: Uncontrolled crowd pressure and unplanned movement of pilgrims.
- **Kalubai Yatra**: Incorrect crowd estimates, narrow pathways, unauthorized vendors, and lack of safety measures.

Proactive Planning for Crowd Control

Most stampedes can be prevented through **proactive planning and execution**. The NDMA suggests a comprehensive strategy including:

- **Managing crowd inflow, venue movement, and outflow**.
- **Analyzing historical crowd data**, peak hours, and visitor trends.
- **Implementing online registration** (e.g., at Vaishnodevi and Sabarimala) to regulate entry.

Infrastructure and Information Management

- Adequate **infrastructure**, such as rest areas and hygiene facilities, should be in place.
- Effective **information dissemination** is crucial for guiding visitors and ensuring order.

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2. National Critical Minerals Mission: Enhancing Self-Reliance

Why in the News?
The Union government has launched the **National Critical Minerals Mission (NCMM)** to reduce India's dependence on imported minerals crucial for clean energy and advanced technologies.

Mission Overview

- **Budget**: ₹34,300 crore over seven years.
- **Objectives**：
  - ○ Enhance domestic exploration of critical minerals.
  - ○ Reduce reliance on imported resources.
  - ○ Support India's transition to green energy.
  - ○ Develop processing and recycling capacities.

Key Features
Boosting Domestic Exploration

● Significant investment in mineral exploration, including offshore resources.

Reducing Import Dependence

● India imports vital minerals like **lithium, cobalt, nickel, and rare earth elements**, which are essential for:
  ○ **Electric Vehicles (EVs)** and battery production.
  ○ **Renewable energy infrastructure** (solar panels, wind turbines).
  ○ **Electronics & high-tech industries** (smartphones, medical devices, defence equipment).

Strengthening Processing and Recycling Capabilities

● Encouraging **investment in mineral processing parks** and **sustainable extraction** technologies.

Acquiring Overseas Mineral Assets

● Public and private enterprises will be supported in acquiring **foreign mineral assets** to ensure a stable supply.

Regulatory and Financial Support

● The mission includes **fast-track mining approvals**, financial incentives, and streamlined regulations.

Strategic Importance of Critical Minerals

● The demand for critical minerals is rising globally due to the clean energy transition.
● Ensuring domestic availability is essential for **India's energy security and technological growth**.

Government Strategy and Implementation

● **Union Cabinet's Approval**: ₹16,300 crore from the government; additional ₹18,000 crore from PSUs and private sector.
● **Key Measures** :
  ○ **Expedited mining clearances**.

- ○ **Strategic mineral stockpiling** to prevent supply shortages.
- ○ **Policy Reforms**: Amendments to the **Mines and Minerals Act (2023)** enabled the auction of 24 strategic mineral blocks.
- ○ **Geological Survey of India (GSI)**: 368 mineral exploration projects launched, with 227 more planned for 2025-26.
- ○ **Customs duty exemptions** on select minerals to encourage domestic manufacturing.

Impact on India's Energy Transition

The mission is expected to:

- ● Secure **supply chains** for clean energy.
- ● Strengthen India's **EV and renewable energy industries**.
- ● Enhance **global competitiveness** in critical minerals.
- ● Attract foreign and private investment in mining and processing.

Challenges and the Way Forward
Key Challenges

- ● **Geopolitical Risks**: Overseas mineral acquisitions depend on international relations.
- ● **Environmental Concerns**: Increased mining must be balanced with **sustainability**.
- ● **Investment Risks**: The private sector needs robust policy support to ensure participation.

Government Strategy to Address Challenges

- ● Collaboration with **research institutions and industries**.
- ● Partnering with **global stakeholders** for sustainable mineral extraction.

Conclusion

The **National Critical Minerals Mission** is a transformative initiative to:

- ● Reduce India's reliance on imports.
- ● Strengthen **domestic mining and processing capabilities**.
- ● Secure India's future in **clean energy and high-tech industries**.

By integrating **exploration, recycling, and international collaboration**, the mission positions India as a **global leader** in critical mineral supply chains.

3. DeepSeek: The AI Challenger Reshaping the Industry

Why in the News?

The Chinese startup DeepSeek has unveiled AI models that rival leading U.S. counterparts at a fraction of the cost. In December 2024, the company disclosed that training its DeepSeek-V3 model cost under $6 million using Nvidia H800 chips. Meanwhile, DeepSeek's AI Assistant has become the top-rated free app on Apple's U.S. App Store, surpassing ChatGPT. This development has sparked concerns over why U.S. tech giants are spending billions on AI and has impacted major company stock prices, including Nvidia's.

DeepSeek: A New Competitor to ChatGPT

- DeepSeek is a free AI chatbot with capabilities similar to ChatGPT, though its effectiveness compared to competitors is still debated.

Performance and Efficiency

- DeepSeek's R1 model is reportedly as powerful as OpenAI's o1, excelling in mathematics and coding.
- It employs a "reasoning" mechanism that processes responses gradually, reducing memory usage and 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 information, reflecting government-imposed restrictions.

Cost-Effective AI Development

- DeepSeek claims it trained its model for just $6 million, significantly lower than OpenAI's estimated $100 million for GPT-4.
- Reports suggest its founder stockpiled Nvidia A100 chips—banned for export to China since 2022—and combined them with cheaper alternatives to develop the AI.

Security Challenges and Outages

- After becoming the most downloaded free app on Apple's U.S. App Store, DeepSeek faced massive cyberattacks, leading to temporary registration limits.

- The company also experienced website outages due to high traffic.

DeepSeek: Shaking Up the AI Landscape
Challenging U.S. AI Dominance

- The launch of OpenAI's ChatGPT in 2022 spurred Chinese tech firms to develop AI chatbots.
- Early models, like Baidu's, failed to meet expectations, reinforcing the gap between Chinese and U.S. AI capabilities.
- DeepSeek has altered this perception by delivering high-quality, cost-effective AI solutions.

Cost-Effective Advantage

- DeepSeek's AI models, DeepSeek-V3 and DeepSeek-R1, have been praised by Silicon Valley executives and engineers.
- The company asserts its models match OpenAI and Meta's leading AI systems while being significantly more affordable.

The AI Race: A Strategic Moment for India
PM Modi's AI Summit Participation

- Prime Minister Modi's attendance at the AI summit in Paris highlights India's need to evaluate the growing AI rivalry between the U.S. and China, particularly after DeepSeek R1's launch.

DeepSeek-Sputnik Analogy

- DeepSeek R1's launch has been compared to the Soviet Union's 1957 Sputnik launch, which shocked the U.S. and triggered an intense space race.
- Similarly, DeepSeek's emergence has intensified U.S.-China technological competition, defining a new battleground in global power struggles.

U.S.-China AI Rivalry: A Bipolar Contest

- China, backed by a robust economy and heavy investments in emerging technologies, is a formidable AI rival to the U.S.
- This competition is likely to remain bipolar, leaving nations like India struggling to keep up. The outcome, however, remains uncertain.

Lessons for Middle Powers: Doing More with Less

- DeepSeek's success illustrates that groundbreaking innovation is possible with limited resources.
- This offers hope for middle powers like India and France, which, despite lower AI budgets, can stay competitive through strategic innovation and collaboration.

Sovereign AI and Strategic Partnerships

- India and France promote the idea of "Sovereign AI," balancing cooperation with the U.S. while pursuing independent AI development.
- A partnership between the U.S. and its allies, including India, could strengthen competition against China.
- However, India must address U.S. concerns over potential technology transfers to Russia to solidify this alliance.

Cooperation Amidst Rivalry

- Historical instances, such as U.S.-Soviet space cooperation during the Cold War, suggest that the U.S. and China may eventually collaborate on AI governance.
- Such collaboration could focus on preventing AI misuse and managing its destabilizing effects, much like nuclear deterrence strategies.

India's Strategic Role in Global AI Governance

- India must avoid past mistakes, such as being excluded from global nuclear governance frameworks, by proactively shaping its AI strategy.
- This is an opportunity for Delhi to influence global AI governance rather than remain a passive player.

Conclusion

- The AI race presents both opportunities and challenges for India.
- By fostering partnerships, investing in innovation, and maintaining strategic clarity, India can position itself as a key player in the evolving AI landscape.

4. The Eighth Wonder of Economic Growth – Unpacking Sustainable Growth Dynamics
Context:

Albert Einstein once likened compound interest to the "eighth wonder of the world," a principle that aptly applies to economic growth. India has immense long-term growth potential, with projections indicating that its GDP per capita could rise from $2,650 to $10,000 by 2045 at an annual real growth rate of 6%. Even at a slightly lower rate of 5.5%, the same target could be met by 2047. However, sustaining this growth requires a long-term, risk-mitigated approach.

Challenges to India's Economic Growth:

- ● **Debt-Driven Growth & Rising Household Borrowing:**
  - ○ Shifting Borrowing Trends: Unlike previous generations, today's consumers increasingly take loans not only for essentials and appreciating assets but also for depreciating goods and experiences.
  - ○ Digital Borrowing: The rise of e-commerce and easy digital lending has fueled consumption through equated monthly instalments (EMIs), boosting short-term growth while potentially straining future financial stability.
  - ○ Rising Debt Burden: Growing household debt and increasing non-performing retail loans indicate the need to regulate personal loan growth to sustain healthy consumption.
  - ○ Encouraging Financial Prudence: Promoting cash purchases with better pricing incentives over EMI schemes can cultivate disciplined spending, drawing from behavioural finance principles like delayed gratification.
- ● **Competition from China:**
  - ○ **Manufacturing Edge:** Despite the adoption of the China+1 strategy, India faces intense competition due to China's well-established manufacturing base, policy support, and surplus capacity.
  - ○ **Export Price Deflation:** Weak domestic demand in China has led to lower export prices, making it harder for Indian manufacturers to compete.
  - ○ **Slow but Steady Progress:** India holds the potential to increase its manufacturing share, but achieving global competitiveness requires sustained policy support and investment.
- ● **Global & Domestic Economic Headwinds:**
  - ○ **Rising U.S. Interest Rates:** Higher interest rates in the U.S. and a stronger dollar have narrowed the investment attractiveness gap between India and the U.S., affecting foreign capital inflows.
  - ○ **Declining Foreign Direct Investment (FDI):** Multinational corporations have sold stakes in Indian businesses, not necessarily due to pessimism but driven by valuation-based decisions.
  - ○ **Stock Market Overvaluation Risks:**

■ Enthusiasm for small and mid-cap stocks, fueled by post-pandemic recoveries and retail investors, has led to potential overvaluation risks.

■ Investors should remain mindful of market cycles and the concept of "reversion to the mean" for sustainable investment strategies.

Strategies for Sustainable Growth:

● **Regulating Personal Borrowing:** Encouraging financial literacy and disciplined borrowing habits can strengthen economic stability.

● **Enhancing Manufacturing Competitiveness:** Infrastructure investments, policy support, and skill development are crucial to positioning India as a global manufacturing hub.

● **Prudent Investment Approaches:** Educating retail investors on market trends and discouraging speculation can foster long-term stability.

● **Government-Led Structural Reforms:** Proactive policymaking to manage inflation, support manufacturing, and attract foreign investment will be key to sustaining growth.

Conclusion – Pathway to $10,000 Per Capita GDP:

● India's goal of achieving a GDP per capita of $10,000 is attainable, provided growth is both sustainable and inclusive.

● Addressing challenges such as debt-fueled consumption, external competition, and market imbalances will be critical.

● By fostering financial discipline, strengthening manufacturing, and implementing strategic investments, India can secure long-term economic resilience and prosperity.

5. India's Fiscal Health Index: Evaluating State-Level Financial Stability

Why in the News?

Dr Arvind Panagariya, Chairman of the 16th Finance Commission, recently unveiled the first edition of NITI Aayog's **Fiscal Health Index (FHI) 2025**, designed to assess the financial performance of Indian states.

Understanding the Fiscal Health Index (FHI):

● The FHI serves as a systematic framework to evaluate the fiscal performance of 18 major states.
● The index focuses on **transparency, revenue generation, and sustainable public financial management** to promote fiscal responsibility among states.
● It consists of five key sub-indices:
  ○ **Quality of Expenditure** (measuring spending efficiency)
  ○ **Revenue Mobilization** (assessing tax and non-tax revenue collection)
  ○ **Fiscal Prudence** (monitoring fiscal deficits and surplus management)
  ○ **Debt Index** (evaluating outstanding state debt levels)
  ○ **Debt Sustainability** (analyzing long-term debt viability)

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

● **Top Performing States:**
  ○ **Odisha** ranked first (FHI score: 67.8), excelling in debt management, low fiscal deficits, and strategic capital expenditure.
  ○ **Chhattisgarh** secured the second spot due to robust debt management and strong revenue inflows from mining.
  ○ **Goa** came third, driven by high tax efficiency and substantial non-tax revenue generation.
● **Struggling States:**
  ○ States like **Punjab, Kerala, and West Bengal** faced significant fiscal challenges, including high debt burdens and weak revenue mobilization, necessitating urgent financial reforms.

Insights from Key Sub-Indices:

● **Quality of Expenditure:**
  ○ States such as **Madhya Pradesh and Chhattisgarh** prioritized spending on social services like health and education.
  ○ In contrast, **Punjab and Rajasthan** underperformed in capital expenditure, which could hinder long-term development.
● **Revenue Mobilization:**
  ○ **Odisha, Goa, and Chhattisgarh** led in revenue collection, benefiting from non-tax revenues like mining royalties.
  ○ States like **Bihar and West Bengal** relied heavily on central government transfers due to weak tax collection.
● **Fiscal Prudence:**

- ○ **Odisha and Jharkhand** maintained low fiscal deficits, ensuring better resource allocation for development.
- ○ **Kerala and Andhra Pradesh**, with persistent revenue deficits, struggled to maintain fiscal stability.
- ● **Debt Management & Sustainability:**
  - ○ **Odisha and Chhattisgarh** effectively managed their debt, ensuring long-term fiscal health.
  - ○ **Punjab and Kerala**, burdened with high debts, require urgent corrective measures to prevent financial crises.

Policy Recommendations for Stronger State Finances:

- ● **Enhancing Revenue Mobilization:** Encouraging states to boost tax compliance and explore alternative revenue sources can reduce dependency on central transfers.
- ● **Strengthening Fiscal Discipline:** Implementing strict fiscal management strategies can help states control deficits and avoid unsustainable debt burdens.
- ● **Optimizing Public Expenditure:** Prioritizing capital investment in infrastructure, health, and education will foster long-term economic stability.
- ● **Addressing Debt Risks:** High-debt states must adopt corrective policies, such as rationalizing subsidies and improving tax efficiency.

Conclusion – Strengthening India's Fiscal Framework:

- ● The **Fiscal Health Index (FHI)** provides valuable insights into state finances, helping policymakers identify areas for improvement.
- ● While states like Odisha and Chhattisgarh have demonstrated strong financial management, others like Punjab and Kerala need urgent fiscal reforms.
- ● By fostering **efficient revenue generation, prudent expenditure management, and sustainable debt practices**, states can ensure long-term fiscal resilience and contribute to India's economic stability.

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

Context:

- ● India's startup ecosystem has grown rapidly, becoming the world's third-largest hub for innovation and entrepreneurship.
- ● The number of recognized startups has surged from **400 in 2015-16** to **over 1,30,000** today, reflecting the nation's entrepreneurial growth.

- This transformation is largely driven by India's robust **digital public infrastructure**, addressing challenges in areas like **financial inclusion**, **sustainable development**, and **agriculture**.

Technological Opportunities and Government Initiatives:

- **Strategic Government Missions:**
  - ○ **National Quantum Mission** aims to position India as a global leader in **quantum computing**, advancing sectors such as **healthcare**, **cybersecurity**, and **finance**.
  - ○ **India AI Mission** focuses on using **artificial intelligence** to address real-world problems like **healthcare access**, **supply chain optimization**, and **urban planning**.
  - ○ **Semiconductor Mission** seeks to boost domestic **semiconductor manufacturing**, reducing reliance on global supply chains and ensuring technological self-sufficiency.
- **Investment in Research & Development (R&D):**
  - ○ The government has allocated ₹1 lakh crore for R&D, supporting both **academic research** and **startup innovation**.
  - ○ This funding bridges the gap between **conceptual research** and **market-ready solutions**.
- **Progressive Policies:**
  - ○ **Space and Geospatial Policy Liberalization** : Private firms now play a larger role in satellite launches and remote sensing, encouraging startups like **Skyroot Aerospace** and **Pixxel**.
  - ○ **Focus on Emerging Sectors** : Support for **drones**, **electric vehicles**, and **clean energy** aligns India's startup ecosystem with **global sustainability goals**.

Key Features of India's Startup Ecosystem:

- **Innovation and Intellectual Property (IP):**
  - ○ India produces **24,000 PhD graduates** annually, contributing to scientific and technological advancement.

○ Despite this, India paid **$14.3 billion** in IP royalties while earning only **$1.5 billion** in 2024, highlighting a significant innovation gap.
○ Strengthening **IP frameworks** is crucial for fostering innovation and making India a global leader in intellectual property creation.
● **Growth in Smaller Cities:**
○ Nearly **50% of startups** now emerge from **Tier II and Tier III cities** such as **Indore**,**Jaipur** , and **Ahmedabad**.
○ Supporting these regions through improved **infrastructure**, **education**, and **gender inclusivity** can unlock new talent and drive innovation.

Funding Challenges for Startups:

● **Access to Patient Capital in Deep Tech:**
○ **Deep tech startups**—in fields like **Albiotech** , and **quantum computing**—require **long-term funding** due to extended product development cycles.
○ Traditional investors often avoid these ventures due to delayed returns.
○ The **Fund of Funds for Startups (FFS)**, launched in **2016**, has committed **₹11,688 crore** across **151 Alternative Investment Funds (AIFs)**, generating **₹81,000 crore** in total investment.
● **Over-Reliance on Foreign Capital:**
○ In **2024**, Indian startups raised **$12 billion**, with **75%** of the funding coming from **international investors**.
○ This heavy reliance on foreign capital makes India vulnerable to **global economic fluctuations** and **misaligned long-term goals**.

Strategies to Address Funding Challenges:

● **Self-Regulation and Ethical Practices:**
○ Recent corporate mismanagement (e.g., **Byju's**,**BharatPe**) highlights the need for **accountability** and **transparency** in governance.
○ Startups must adopt **ethical frameworks**, with mentorship, professional boards, and sound financial management ensuring long-term stability.
● **Leveraging Domestic Institutional Capital:**

- ○ Large domestic institutions—such as **insurance companiespension funds** , and **mutual funds**—can provide **long-term capital** to startups.
- ○ Allocating a portion of these funds to innovative startups would reduce dependence on foreign investors while boosting India's **economic self-sufficiency**.
- ● **Creating a Resilient Domestic Funding Ecosystem:**
  - ○ Increasing **domestic capital participation**, establishing **specialized funds** for high-risk sectors, and promoting a **long-term investment culture** will foster financial resilience.
- ● **A Dedicated Fund for Deep Tech:**
  - ○ A **specialized fund** focused on deep tech startups is needed to provide patient capital and enable cutting-edge research without the pressure of quick returns.

Conclusion:

- ● With **favourable policies**, a **vibrant innovation culture**, and **cross-sector collaboration**, India is well-positioned to become the world's leading **startup ecosystem**.
- ● As India aims to achieve **Viksit Bharat by 2047**, its **startups** will play a critical role in driving **economic growth**, **job creation**, and **global leadership** in innovation.

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

Why in the News?

Prime Minister **Narendra Modi** marked the **150th anniversary** of the **India Meteorological Department (IMD)**, recognizing its pivotal role in **disaster management**, **economic resilience**, and **international cooperation**.

Origin and Importance of IMD:

● Established in **1875**, following major disasters like the **Calcutta cyclone (1864)**, highlighting the need for **centralized meteorological services**.
● Operates under the **Ministry of Earth Sciences**, serving as India's primary agency for **weather monitoring** and **forecasting**.

Key Highlights of the 150th Anniversary:

● **Vision Document 2047**: Outlines future goals for the IMD's development.
● **Achievements**: PM Modi praised IMD's improved forecasting, citing accurate predictions for the **Z-Morh tunnel** inauguration in Kashmir.

IMD's Major Achievements:

● **Indigenous Technology Development:**
  ○ First **indigenous radar** in **1958** and **satellite collaborations** with ISRO since **1983**.
  ○ Other innovations include:
    ■ **Automatic Weather Stations (2000)**
    ■ **Doppler Weather Radar (2010)**
    ■ **Impact-based Forecasting (2019)**
    ■ **Dynamic Composite Risk Atlas (2022)**
● **Mission Mausam:**
  ○ Focuses on improving **weather surveillance** with high-resolution atmospheric data, next-generation **radars**, and **advanced computing**.
● **Global Cooperation:**
  ○ IMD supports neighbouring countries like **NepalBangladesh**, and **Sri Lanka** through its **Flash Flood Guidance System**.
  ○ Recognized by the **World Meteorological Organization (WMO)** for its leadership in the Asia-Pacific region.

Vision for the Future of IMD:

● **Enhanced Forecast Accuracy:**

○ Aim for **zero-error** forecasts for **three-day predictions** and **90% accuracy** for five-day forecasts by **2047**.
● **Technological Expansion:**
   ○ Develop **earthquake warning systems** and extend monitoring networks across **land**, **sea**, and **space**.
   ○ Improve capabilities to detect localized **severe weather events**.

Conclusion:

● PM Modi emphasized IMD's **crucial role** in **safeguarding lives** and **fostering global collaboration**.
● With ambitious plans under **Vision Document 2047**, IMD is set to transition from **weather forecasting** to **comprehensive weather management**, making India a **weather-ready nation** by **2047**.

Safeguarding the Rights of Forest-Dwelling Communities: Ministry of Tribal Affairs Steps In

Why in the News?

The Ministry of Tribal Affairs (MoTA) has reaffirmed its commitment to protecting forest-dwelling communities from illegal evictions, as outlined in the Forest Rights Act (FRA). In a recent directive to states, the Ministry stressed the importance of establishing institutional mechanisms to uphold the law and creating a grievance redressal system.

Overview of the 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 crucial law that acknowledges and safeguards the rights of forest-dependent communities in India.

Key Objectives:

● **Recognition of Rights:** Acknowledging the traditional rights of Scheduled Tribes (STs) and Other Traditional Forest Dwellers (OTFDs) over forest resources.
● **Protecting Livelihoods:** Ensuring sustainable forest use by local communities.

- **Empowering Communities:** Granting legal access and ownership of forest land and resources.

Types of Rights Recognized:

- **Individual Rights:** Ownership and access to forest land for habitation and cultivation.
- **Community Rights:**
    - ○ Access to minor forest produce (e.g., bamboo, honey, lac).
    - ○ Grazing rights and usage of water bodies.
    - ○ Participation in forest management and conservation.
- **Community Forest Resource Rights:** Authority to protect, regenerate, and sustainably manage forests.

Key Features:

- **Land Ownership:** Grants up to 4 hectares per family for cultivation.
- **Protection from Eviction:** Prevents forced displacement without due recognition and settlement of rights.
- **Role of Gram Sabha:** Empower village assemblies to determine and approve rights.
- **Conservation Measures:** Promotes sustainable forest management while preserving biodiversity.

Challenges in Implementation:

- **Slow Progress:** Delays in recognizing rights across states.
- **Proof of Eligibility:** Difficulty in obtaining documentary evidence.
- **Conflicts with Conservation Laws:** Balancing forest rights with wildlife and environmental protection efforts.
- **Industrial Opposition:** Resistance from industries dependent on forest resources.

Addressing Concerns Over Forest Rights

- The Ministry's intervention follows complaints from forest communities, particularly those residing in tiger reserves in **Madhya Pradesh, Maharashtra, and West Bengal**.
- Residents reported **forced evictions** without proper recognition of their rights under the FRA and the Wildlife Protection Act.

Key Cases:

- **Madhya Pradesh:** In December, 52 Gram Sabhas from the Durgavati Tiger Reserve filed petitions, prompting the Ministry to instruct the state tribal department to intervene.
- **Maharashtra:** In October, villagers from Rantalodhi (Tadoba Tiger Reserve) raised similar grievances.

These cases highlight the need for **greater accountability** and adherence to legal provisions in resettlement efforts.

Ministry's Directives to States

To ensure compliance, the Ministry has asked state tribal and forest departments to submit detailed reports on:

- **Villages in Tiger Reserves:** Names and numbers of affected settlements.
- **Demographic Data:** Tribal and forest-dwelling communities residing in these areas.
- **Forest Rights Claims:** Status of claims received, approved, or rejected under FRA.
- **Consent and Compensation:** Procedures for securing informed consent from Gram Sabhas and compensation plans for relocation.

The Ministry emphasized that **Section 4(2) of the FRA** explicitly protects forest communities by **legally recognizing their rights, preventing forced evictions, and ensuring voluntary resettlement with consent**.

Understanding India's Economic Slowdown: Key Takeaways & Recommendations

Current Economic Outlook:

- **Growth Rate Decline:**
  - The National Statistics Office (NSO) projects India's real GDP growth at **6.4% for 2024-25**, down from **8.2% in 2023-24**.
  - This is lower than the **6.5-7%** estimate in the **Economic Survey 2023-24** and the **10.5% nominal GDP growth** projection in the **Union Budget**.
- **Data Inconsistencies:**
  - Experts, including the **IMF**, have raised concerns over using the **Wholesale Price Index (WPI) as a deflator** in GDP calculations.
  - The gap between **WPI and Consumer Price Index (CPI) inflation** has led to inconsistencies in real and nominal GDP figures.

Challenges in Private Investment:

- ● **Weak Corporate Investment:**
  - ○ Despite **corporate tax cuts in 2019**, private investments in **machinery and intellectual property** remain low.
  - ○ Most private investments are concentrated in **real estate and infrastructure**, reflecting an imbalanced investment pattern.
- ● **Declining Growth Compared to 2004-2014:**
  - ○ Between **2004-2014**, real private investment grew at **10% annually**, surpassing public investment growth (9%).
  - ○ Since **2014**, private investment has slowed to **6.3%**, while public investment has grown to **6.6%**.
- ● **Post-Pandemic Trends:**
  - ○ Although private investment rebounded in **2021-22**, long-term structural improvements have been limited.

Sectoral Trends:

- ● **Manufacturing:** Initially experienced **double-digit growth in early 2023-24**, but later slowed.
- ● **Mining, Power, and Construction:** Witnessing significant slowdowns.
- ● **Services Sector:** Retail, transport, finance, and real estate are showing signs of deceleration.
- ● **Public Administration & Defence:** The only sector expected to grow faster in **2024-25**, driven by **public spending**.

Fiscal Challenges:

- ● **Revenue Deficit:**
  - ○ By **November 2024**, only **56%** of the net tax revenue target had been met, while **non-tax revenues** reached **78%** due to RBI's surplus transfer.
- ● **Public Spending Shortfall:**
  - ○ Less than **50%** of the ₹11.11 trillion **capital expenditure (capex) target** had been spent by November 2024.
- ● **Fiscal Dilemma:**
  - ○ Cutting spending to maintain **fiscal discipline** could further slow growth.
  - ○ Increasing public spending without fiscal reforms risks **rising debt and interest burdens**.

Policy Recommendations:

- **Boost Revenue:**
  - ○ Revise **taxation policies** to increase **taxes on wealth and corporate profits**, ensuring higher **public spending** on infrastructure and welfare.
- **Revive Private Investment:**
  - ○ Strengthen **incentives** for investment in **manufacturing and intellectual property**.
- **Increase Public Spending:**
  - ○ Prioritize capex in **infrastructure and renewable energy** to stimulate economic growth.
- **Improve Economic Data:**
  - ○ Replace the **WPI-based deflator** with the **Producer Price Index (PPI)** for more accurate GDP estimates.
  - ○ Update GDP calculation methods to reflect real-time economic changes.

Long-Term Strategies:

- **Structural Reforms:**
  - ○ Enhance the **ease of doing business**, reduce **bureaucratic delays**, and improve **credit access for SMEs**.
- **Boost Global Trade:**
  - ○ Strengthen **exports** through trade agreements and expand **manufacturing** under the **Production Linked Incentive (PLI) scheme**.
- **Strengthen Consumption:**
  - ○ Support **rural demand** through **direct income transfers** and employment schemes like **MGNREGA**.

Conclusion:

- India's economic slowdown is driven by **weak private investment, sectoral deceleration, and fiscal constraints**.
- A **balanced approach** combining **higher public spending, improved private sector incentives, and stronger revenue mobilization** is essential.
- Addressing **statistical inconsistencies** and implementing **long-term structural reforms** will be key to **sustained economic growth**.

The Right to Food and Challenges in the Public Distribution System (PDS)

Context

- The right to food, a fundamental aspect of human dignity and survival, has been recognized as a fundamental right in India for over two decades.
- However, reports from states like Jharkhand, Odisha, and Bihar highlight significant shortcomings in the Public Distribution System (PDS), which fails to protect the most vulnerable sections of society.
- Bureaucratic inefficiencies, corruption, and social inequalities have created obstacles that deprive marginalized communities of their essential food entitlements.

The Crisis of Exclusion
Extent of Exclusion

- In Jharkhand and Odisha, numerous households have been arbitrarily removed from PDS rolls without proper justification or due process.
- The issue is particularly severe in Bihar, where the Musahar community, one of the most marginalized caste groups, faces extreme deprivation due to exclusion from food security programs.

Challenges with Biometric Verification

- The introduction of biometric authentication at fair price shops (FPS) aimed to improve efficiency and curb fraud.
- However, it has inadvertently led to exclusion, as many beneficiaries, especially in rural and marginalized areas, are unable to authenticate their biometrics due to technical glitches, lack of infrastructure, or Aadhaar-related discrepancies.
- Once removed from the PDS system, re-enrolling requires navigating complex bureaucratic hurdles.

Gaps in Governance

- The exclusion of marginalized communities from the PDS reflects a larger disconnect between policymaking and the realities of those most dependent on welfare programs.
- While the government prioritizes ambitious initiatives like 'smart cities,' it has failed to address the pressing issue of food security for the underprivileged.

Case Study: The Musahar Community

- During the COVID-19 crisis, Bihar faced severe supply shortages, exacerbating food insecurity among the poorest communities.

- The Musahar community, already pushed to the margins due to caste-based discrimination, continues to struggle for stable access to rations.
- Many Musahar households in the Patna district lack active ration cards, and even those with cards often find that not all family members are listed, reducing their entitlements.

Systemic Issues in the PDS
Corruption and Mismanagement

- Under the Priority Household (PHH) ration card scheme, beneficiaries are entitled to five kilograms of food grains per person. However, they frequently receive only four kilograms, often of substandard quality.
- Wheat, a dietary staple, is frequently not supplied at all.
- Such practices indicate widespread mismanagement and exploitation that deprive vulnerable families of their rightful food support.

Legal and Administrative Barriers

- The cumbersome enrolment process for ration cards further restricts access to food. ● In Bihar, applicants must submit Aadhaar details, caste certificates, income proofs, and residence documents—requirements that have no legal backing under the National Food Security Act (NFSA) of 2013 or the PDS Control Order of 2015. ● Similar bureaucratic obstacles exist in Jharkhand, Uttar Pradesh, and Madhya

  Pradesh, revealing a nationwide governance failure.
- The push for digitization has prioritized technology over accessibility, leaving those lacking digital literacy at a severe disadvantage.

Consequences of Exclusion: Exploitation and Vulnerability

- The inefficiencies in the PDS have led to the emergence of an exploitative black market.
- Middlemen charge exorbitant fees—sometimes over ₹3,000—for processing ration card applications. In many cases, these agents disappear after collecting payments, leaving applicants with neither documents nor recourse.
- Even when applications are submitted, the process remains slow. Despite a legal mandate to issue ration cards within 30 days, many remain pending for months or even years, denying families their right to food.

Urgent Reforms Needed
Streamlining the Enrolment Process

- The complex PDS registration process disproportionately affects marginalized groups.
- Documentation requirements—such as caste and income certificates—should be eliminated to align with NFSA and PDS regulations.
- A single-window application system with minimal paperwork and clear procedural guidelines should be implemented.

Improving Accountability and Reducing Corruption

- Corruption in the PDS undermines trust and deprives beneficiaries of their rightful entitlements.
- Strict oversight and enforcement mechanisms should be introduced to prevent FPS dealers from reducing the quality and quantity of rations.
- Independent monitoring bodies should be established to audit distribution and ensure compliance with norms.
- Strengthening whistleblower protection and grievance redressal mechanisms can encourage beneficiaries to report malpractice without fear.

Empowering Local Governance

- Decentralizing the PDS can enhance efficiency and accountability.
- Local governance bodies, such as Panchayats, should be empowered to oversee distribution and address grievances.
- These bodies can also help identify eligible beneficiaries to prevent exclusion due to bureaucratic lapses.

Conclusion

- The right to food, reinforced by the landmark **People's Union of Civil Liberties vs. Union of India (2001)** case, remains unfulfilled for millions.
- Systemic inefficiencies, bureaucratic red tape, and governance failures continue to deny marginalized communities their fundamental right to food.
- Addressing these issues is not just a governance challenge—it is a moral obligation to ensure dignity and survival for the most vulnerable.

● Achieving true food security requires not just policy interventions but a commitment to equity, accountability, and the principle that no one in India should go hungry.

Rat-Hole Mining: Workers Trapped in a Coal Mine in Assam
Why in the News?

A tragic incident occurred in Assam's Dima Hasao district, where three miners were confirmed dead and six others remained trapped in a flooded rat-hole coal mine. The water inside the pit has reached a depth of 200 feet, prompting the Indian Navy to deploy deep-sea divers for rescue operations. The incident took place in Umrangso, affecting nine miners aged 26 to 57. Despite the district's widespread coal and quarrying activities, Assam's Chief Minister suggested that the mine in question was likely operating illegally.

What is Rat-Hole Mining?

● **Definition:**
1. Rat-hole mining is a method of coal extraction involving narrow, horizontal seams, particularly common in Meghalaya.
2. The name "rat-hole" comes from the small, tunnel-like pits used, typically just large enough for a single person to descend and extract coal.
3. Miners access the pits via ropes or bamboo ladders and use primitive tools like pickaxes and shovels for extraction.

● **Types of Rat-Hole Mining:**
1. **Side-Cutting Method:**
   ■ Narrow tunnels are dug into hill slopes, with miners advancing until they reach a coal seam.
   ■ Coal seams in Meghalaya's hills are often less than 2 meters thick.
2. **Box-Cutting Method:**
   ■ A rectangular opening (10 to 100 sqm) is created, followed by a vertical pit (100 to 400 feet deep).
   ■ Once the coal seam is located, horizontal tunnels are dug at rat-hole scale to extract coal.

Hazards of Rat-Hole Mining

● **Safety Risks:**
   ○ Absence of ventilation, structural reinforcements, and safety equipment.
   ○ High incidence of accidents, injuries, and fatalities.

- **Environmental Impact:**
  - ○ Leads to land degradation and deforestation.
  - ○ Pollutes water sources due to unregulated mining activities.

Challenges in Addressing Rat-Hole Mining

- **Socioeconomic Factors:**
  - ○ The practice persists due to economic dependence on mining.
  - ○ The lack of alternative employment opportunities makes regulation difficult.
- **Regulatory Issues:**
  - ○ Many mines operate without regulation despite official bans.
  - ○ The industry continues to face criticism for its dangers and environmental destruction.

NGT Ban on Rat-Hole Mining

- **National Green Tribunal (NGT) Ruling:**
  - ○ In 2014, the NGT banned rat-hole mining, reaffirming the decision in 2015.
  - ○ The ban was motivated by frequent miner fatalities, especially due to mine flooding during monsoons.
- **Meghalaya's Case:**
  - ○ The ban was primarily enforced in Meghalaya, where the practice was widespread.
  - ○ The Meghalaya state government challenged the NGT's decision in the Supreme Court.

PRELIMS SPECIAL

The National Green Tribunal (NGT)

The National Green Tribunal (NGT) was established in 2010 under the National Green Tribunal Act to ensure the swift and effective resolution of cases concerning environmental protection, forest conservation, and the preservation of natural resources. It is a specialized body with the necessary expertise to handle complex environmental disputes involving multiple disciplines.

Unlike regular courts, the Tribunal is not bound by the Code of Civil Procedure, 1908, but follows the principles of natural justice. It is required to make efforts to resolve applications or appeals within six months of filing.

The principal bench of the NGT is located in New Delhi, with additional benches in Bhopal, Pune, Kolkata, and Chennai.

The Tribunal consists of:

- A **Chairperson**, who is a retired Supreme Court judge.
- **Judicial members**, who are former High Court judges.
- **Expert members**, who are professionals with a minimum of 15 years of experience in environmental or forest conservation fields.

Pobitora Wildlife Sanctuary

Located in the eastern region of Guwahati, Assam, Pobitora Wildlife Sanctuary was established in 1998 and spans an area of 48.81 square kilometres. The sanctuary is part of the Brahmaputra floodplains and includes the Rajamayong Reserve Forest and Pobitora Reserve Forest. It is surrounded by several small hills, including Kasasila, Hatimuria, Boha, Kardia, Govardan, and Panbari hills.

Pobitora is renowned for having the highest density of Greater One-Horned Rhinoceroses in India. It also played a significant role in the **Indian Rhinoceros Vision 2020 (IRV 2020)**, with eight rhinos being translocated from Pobitora to Manas National Park.

- **Fauna:** The grasslands provide a habitat for species such as the Greater One-Horned Rhinoceros, Wild Water Buffalo, Monitor Lizard, and Wild Boar.
- **Flora:** Approximately 72% of the sanctuary is covered with wet savannah vegetation, including species like *Arundo donax, Erianthus ravennae, Phragmites karka, Imperata cylindrica,* and *Saccharum spp.* However, **Water Hyacinth (*Eichhornia crassipes*)** poses a major challenge, particularly for waterfowl, as it forms dense mats on water surfaces.

Norovirus

Norovirus is a highly contagious virus that causes inflammation of the stomach and intestines, leading to gastroenteritis. It is commonly known as the "stomach flu" or the "winter vomiting bug." People of all age groups can contract norovirus, as it spreads rapidly and easily. The virus is responsible for approximately **90% of viral gastroenteritis outbreaks** and nearly **50% of gastroenteritis cases worldwide**. Since there are multiple strains of norovirus, individuals can get infected multiple times in their lifetime.

- **Transmission:** The virus spreads primarily through contaminated food or water, surfaces, and direct contact with infected individuals.
- **Symptoms:** Symptoms appear within one to two days of exposure and include vomiting, diarrhoea, nausea, abdominal pain, fever, headaches, and body aches. In severe cases, dehydration can occur due to fluid loss.
- **Treatment:** There is currently no vaccine for norovirus. Treatment mainly focuses on symptom relief, with hydration being crucial. In severe cases, patients may require intravenous rehydration therapy.

Intangible Cultural Heritage (ICH)

Intangible Cultural Heritage (ICH) includes cultural traditions, expressions, knowledge, and skills that are passed down through generations, forming a vital part of a community's identity. Unlike tangible heritage, such as monuments or artefacts, ICH is non-physical and exists in the form of customs and living practices.

UNESCO Intangible Cultural Heritage List

The UNESCO Intangible Cultural Heritage list seeks to recognize and protect cultural traditions and expressions that reflect human creativity and diversity. It was established under the **2003 Convention for the Safeguarding of Intangible Cultural Heritage**, which came into effect in 2008.

Vasilopita

Vasilopita is a traditional Greek cake prepared to celebrate the New Year. A coin, called *flouri*, is hidden inside, and whoever finds it is believed to receive good fortune, love, and good health for the year ahead.

Origins of the Tradition

This tradition is linked to legends surrounding Saint Basil, who is considered the Greek equivalent of Santa Claus.

Tribute

The name *Vasilopita* translates to "Sweet Bread of Basil" and serves as an homage to Saint Basil, a bishop renowned for his generosity. The first slice of the cake is dedicated to **Jesus Christ**, the second to the **Virgin Mary**, and the third to **Saint Basil**.

Tamu Lhosar Festival

Tamu Lhosar is celebrated by the **Gurung community** to mark the beginning of the New Year and bid farewell to the previous year. In the Gurung language, *Lho* means "year,"

and *Sar* signifies "change." The festival falls on **Push 15** in the Nepali calendar (December–January) and coincides with the longest night of the year, after which the nights begin to shorten.

Celebration Areas

The festival is widely observed in **Nepalese districts with a large Gurung population**, including **Lamjung, Gorkha, Tanahun, Syangja, Manang, Kaski, and Parbat**.

Cultural Activities

The Gurung community marks the occasion with feasts and cultural programs.

State Funeral

A **state funeral** is an official ceremony held to honour prominent personalities, following a set protocol and involving public mourning. In India, state funerals are generally conducted for the **President, Prime Minister, former Presidents, or Governors**. However, the government may grant a state funeral for other dignitaries on a case-by-case basis.

Protocol for a State Funeral

- The event is attended by **gazetted officers** and **service personnel** in formal state attire.
- The **Ministry of Defence** is responsible for organizing the funeral, following a notification from the **Ministry of Home Affairs**.

Financial Stability Report (FSR)

The **Financial Stability Report (FSR)** is a **biannual publication by the Reserve Bank of India (RBI)** that evaluates the strength and resilience of the Indian financial system. The report provides insights into the performance of various financial sectors, including **banking, non-banking financial companies (NBFCs), mutual funds, insurance firms, and financial markets**.

Good Governance Index
About the Index

The **Good Governance Index (GGI)** was introduced on **December 25, 2019**, to coincide with the birth anniversary of **former Prime Minister Atal Bihari Vajpayee**, which is observed as **Good Governance Day**. The index evaluates governance across more than **50 indicators** covering areas such as **agriculture, economic governance, public health, and citizen-centric governance**.

Rankings
- **Tamil Nadu** ranked **first among large states** in **2019**.
- **Gujarat** topped the list in **2021**.

Good Governance Day

December 25 is officially celebrated as **Good Governance Day**, an initiative announced by the Indian government in **2014**. The day promotes the concept of **"Good Governance through e-Governance."**

Di-Ammonium Phosphate (DAP):

DAP is one of the most widely used fertilizers worldwide, supplying essential nutrients—nitrogen (N) and phosphorus (P)—crucial for plant growth. In India, it is the second most commonly used fertilizer after urea. Its high phosphorus content aids in root development, ensuring plants grow efficiently and reach maturity in a timely manner. DAP is highly soluble, allowing it to quickly dissolve in soil and release plant-available phosphate and ammonium.

Other Applications of DAP:
- Used as a fire retardant by mixing with other substances to prevent forest fires.
- Utilized in industrial processes such as metal finishing.
- Added to wine to sustain yeast fermentation.
- Incorporated into milk to aid in the production of cheese cultures.
- Serves as a flux in soldering metals like tin, copper, brass, and zinc.

Central Groundwater Board (CGWB):

CGWB is a scientific organization under the Department of Water Resources, River Development, and Ganga Rejuvenation, Ministry of Jal Shakti, Government of India. As the national apex agency, it provides scientific inputs for managing, exploring, monitoring, assessing, augmenting, and regulating the country's groundwater resources.

Mandate:
- Develop and implement technologies for sustainable groundwater management.
- Formulate and oversee national policies related to groundwater conservation, augmentation, pollution prevention, and equitable distribution, ensuring economic and ecological efficiency.

Headquarters: Bhujal Bhawan, Faridabad, Haryana.

Tinnitus:

Tinnitus refers to the perception of sound without any external source, meaning only the affected individual hears it.

Causes:

- Often results from age-related hearing loss, ear injuries, or circulatory system issues.

Symptoms:

- Can lead to sleep disturbances, anxiety, depression, irritability, and social withdrawal.
- Individuals may experience phantom noises like buzzing, roaring, or clicking.

Treatment:

- Managed using hearing aids, sound-masking devices, medications, or coping techniques.

Tobacco Board of India:

The Tobacco Board of India was established on January 1, 1976, under the **Tobacco Board Act, 1975** (Act 4 of 1975). It functions under the Ministry of Commerce and Industry and is responsible for regulating and promoting the tobacco industry.

Key Responsibilities:

- Facilitates export promotion of tobacco and related products.
- Manages the production and distribution of Flue-Cured Virginia (FCV) tobacco for both domestic consumption and exports.
- Ensures fair prices for farmers and promotes export opportunities.
- Provides financial assistance to farmers through banks to support quality tobacco production.
- Engages in developmental initiatives for sustainable tobacco farming.
- Assists farmers in meeting international quality standards.

Headquarters: Guntur, Andhra Pradesh.

India's Tobacco Industry:

- India ranks as the **second-largest** tobacco producer after China.
- It is the **fourth-largest** producer of FCV tobacco, following China, Brazil, and Zimbabwe.
- India is the **second-largest** exporter of unmanufactured tobacco (by quantity) after Brazil.

Vembanad Lake:

Location: Known locally as *Vembanad Kayal*, it is India's longest lake and Kerala's largest, spanning the districts of Alappuzha, Kottayam, and Ernakulam.

Significance:
- Recognized as a Ramsar site in 2002, highlighting its importance as a wetland of global significance.
- Formed by four rivers—Meenachil, Achankovil, Pampa, and Manimala—with an outlet to the Arabian Sea.
- A major freshwater source with sections containing brackish water.

Cultural Importance:
- A key destination for backwater tourism.
- Hosts the prestigious **Nehru Trophy Boat Race**, commonly known as the Snake Boat Race.

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.

Key Characteristics:
- Hardly interact with matter, earning the name *"ghost particles."*
- Billions of neutrinos pass through a cubic centimetre of space every second.

Cubic Kilometre Neutrino Telescope (KM3NeT):

KM3NeT is a deep-sea neutrino telescope deployed under the Mediterranean Sea. It is designed to detect high-energy neutrinos by capturing flashes of **Cherenkov radiation**—light produced when neutrinos interact with water or ice molecules.

Why the Deep Sea?
- The dark, transparent depths offer ideal conditions for detecting neutrino interactions, enhancing observation accuracy.

Belly Landing:

A **belly landing** or **gear-up landing** occurs when an aircraft lands without extending its landing gear, causing its underside (fuselage) to make direct contact with the runway instead of its wheels.

Reasons for Belly Landing:
- Occurs due to mechanical failure preventing landing gear deployment.

- Pilots may deliberately opt for a belly landing when it presents a safer stopping option.

Brazilian Velvet Ant:
Velvet ants belong to a group of parasitic wasps known for their striking colouration and powerful sting.
- **Appearance**: These wasps, some of which are wingless, get their name from their velvety exterior. The Brazilian Velvet Ant is particularly notable for its black and white markings.
- **Habitat**: It resides in the Caatinga, a shrub desert in Brazil.
- **Characteristics**: This species exhibits high mobility and travels significant distances in search of hosts. It is most active in the early morning and late afternoon when sunlight is less intense. Recent studies show that the black parts of the female velvet ant are ultra-black, meaning they absorb almost all visible light.
- **Unique Aspect**: Ultrablack pigmentation is uncommon in the animal kingdom. It helps certain organisms by offering camouflage, regulating body temperature, or enhancing visual contrast to attract mates.

Melatonin
Melatonin is a neurohormone produced by the pineal gland in response to darkness, influencing sleep cycles.
- It regulates the body's internal clock, making individuals feel sleepy at specific times.
- Melatonin secretion peaks in the middle of the night and gradually decreases towards morning, signalling wakefulness.

Parkinson's Disease
Parkinson's is a progressive neurological condition affecting movement and balance.
- **Cause**: It results from the degeneration of nerve cells in the substantia nigra, a part of the brain responsible for movement. These cells lose their ability to produce dopamine, a neurotransmitter essential for motor control.
- **Symptoms**: Lack of dopamine leads to slowed movement, tremors, and imbalance.

- **Treatment**: While there is no cure, treatments can help manage symptoms and improve quality of life.

Gomti River
The Gomti River is a tributary of the Ganges, flowing entirely through Uttar Pradesh.
- **Origin**: It originates from Gomat Taal (also known as Fulhaar Jheel) in the Pilibhit district.
  - **Course**: Flowing southward, it passes through Lucknow, Barabanki, Sultanpur, Faizabad, and Jaunpur before merging with the Ganges.
  - **Characteristics**: It remains sluggish year-round, except during the monsoon when rainfall causes a surge in water flow.

Business Ready (B-READY) 2024
India faces challenges in achieving high rankings in the World Bank's **Business Ready** report.
  - **About**: Launched by the World Bank, the B-READY report evaluates business environments and investment climates across economies.
  - **Scope**: It replaces the earlier Doing Business Index and assesses regulatory frameworks, public services, and their effectiveness in enabling business operations.

Types of Injections
  - **Intramuscular (IM)**: Administered deep into the muscle at a 90-degree angle. ● **Intravenous (IV)**: Given directly into a vein, typically at a 25-degree angle. ● **Intradermal (ID)**: Injected just under the outer skin layer into the dermis.
  - **Subcutaneous (SC)**: Placed beneath the skin layers at a 45-degree angle.

Project-75
Project 75 involves the construction of six **Scorpene-class** diesel-electric submarines for the Indian Navy.
  - **Development**: Built at **Mazagon Dock Shipbuilders Limited (MDL)** in Mumbai in collaboration with the French **Naval Group**.
  - **Progress**:
    - Commissioned submarines: INS **Kalvari**, **Khanderi**, **Karanj**, **Vela**, and **Vagir**.

○ The final submarine, **Vagsheer**, is under construction.

Panchayat Se Parliament 2.0
A program organized by the **National Commission for Women (NCW)** in partnership with the **Lok Sabha Secretariat** and the **Ministry of Tribal Affairs**.
- **Objective**: To empower **502 elected women representatives** from Scheduled Tribes across 22 states and UTs.
- **Activities**: Workshops, sessions on parliamentary procedures, and visits to key locations like the new Parliament House, Samvidhan Sadan, and Rashtrapati Bhavan.

Mucuna Bracteata
An invasive **cover crop** was originally introduced to rubber and oil palm plantations.
- **Purpose**: Initially planted to prevent weeds and regulate nitrogen levels due to its drought-resistant properties.
- **Spread**: Now spreading across the **Western Ghats** in Tamil Nadu's **Kanniyakumari district**, overpowering native plants and trees.
- **Threat**: Its aggressive growth endangers biodiversity and affects vegetation near the **Kalakkad-Mundanthurai Tiger Reserve**.

Polavaram Project
A **multi-purpose irrigation project** on the **Godavari River** in Andhra Pradesh.
- **Function**: Addresses water scarcity, enhances agricultural productivity, and generates hydroelectric power.
- **Flood Control**: Designed to handle extreme floods occurring once in **1,000 years**.
- **Significance**: Its **spillway** will have the **highest discharge capacity in the world (50 lakh cusecs)**, surpassing China's **Three Gorges Dam**.
- **Status**: Recognized as a **national project** by the Government of India.

Nanopore Technology
A cutting-edge method for sequencing **DNA and RNA** using nano-scale pores in a thin membrane.
- **How It Works**: Measures electrical changes as biological molecules pass through nanopores.

- **Advantages**:
  - ○ **Cost-effective** and requires **minimal lab infrastructure**.
  - ○ Allows **real-time sequencing** and **analysis of native DNA/RNA**.
  - ○ Can be used for **ultra-long read sequencing**.

Rani Velu Nachiyar

An 18th-century queen of **Sivaganga**, Tamil Nadu, and the first female ruler to fight against British colonial rule.

- **Early Life**: Trained in **martial arts** (Silambam, archery), **horse riding**, and **warfare**.
- **Allies**: Formed strategic alliances with **Hyder Ali** and **Gopala Nayaker** to wage war against the British.
- **Legacy**: Entrusted administration to the **Marudu brothers** in 1780 after reclaiming her kingdom.

Digital Transformation in Governance

- **Efficiency**: Speeds up administrative processes and enhances service delivery.
- **Transparency**: Enables real-time tracking of government initiatives, improving accountability.
- **Accessibility**: Expands access to government services, particularly in remote areas.
- **Cost Reduction**: Automation reduces operational expenses.
- **Citizen Participation**: Encourages public engagement through digital platforms.

iGOT Karmayogi Platform

A **government e-learning portal** was launched in 2020.

- **Purpose**: Trains public officials in **data analytics, governance, and digital technologies**.
- **Key Feature**: Offers **personalized learning paths** for continuous skill enhancement.

e-Office Initiative

A digital system that replaces paperwork in government operations.

- **Functionality**:
  - ○ **Automates file management and workflows**.
  - ○ **Enhances efficiency** through real-time processing.

○ **Improves transparency** in decision-making and grievance redressal.

Dozer Push Mining Method
The Dozer Push Mining Method is an innovative, automated, and unmanned approach designed to enhance safety and efficiency in mining operations. Developed by CSIR-CIMFR, it effectively controls vibration and fly rock, ensuring a safer mining environment.

Advantages

This method serves as a viable alternative to conventional truck-shovel, shovel-dumper, and dragline mining techniques. It offers several benefits, including:

● Faster coal recovery and reduced downtime due to adverse weather conditions like the monsoon.
● A significant reduction of 7-10% in operational costs compared to traditional methods.
● Enhanced productivity by optimizing dragline utilization and lowering unit costs.
● Improved worker safety by eliminating manual labour risks associated with traditional mining practices.

BHARATPOL Portal
The BHARATPOL Portal is being developed by the Central Bureau of Investigation (CBI) to streamline international assistance requests through INTERPOL. It will facilitate the issuance of Red Notices and other color-coded INTERPOL notices.

Key Features

● Enhances the efficiency of field-level police officers in addressing crime and security concerns.
● Strengthens India's efforts against transnational crimes by ensuring faster access to international assistance.
● Enables real-time information sharing among Indian law enforcement agencies (LEAs), improving response times and coordination.

Alaknanda River
The Alaknanda River is one of the two primary headstreams of the Ganges, originating from the Satopanth and Bhagirath Kharak glaciers in Uttarakhand's Garhwal Himalayas. Along its 190 km journey, it converges with several tributaries, forming the sacred **Panch Prayag** confluences:

- **Vishnuprayag** – Alaknanda meets Dhauliganga
- **Nandprayag** – Alaknanda meets Nandakini
- **Karnaprayag** – Alaknanda meets Pindar
- **Rudraprayag** – Alaknanda meets Mandakini
- **Devprayag** – Alaknanda meets Bhagirathi, officially forming the Ganga

Alaknanda contributes more to the Ganga's flow than the Bhagirathi. Several significant pilgrimage sites, including Badrinath, Hemkund Sahib, and Joshimath, lie along its course, making it an integral part of the **Char Dham Yatra**.

Vembanad Lake

Vembanad Lake, India's longest and Kerala's largest lake, spans 2,033 sq. km across the Alappuzha, Kottayam, and Ernakulam districts. Also known as **Vembanad Kayal, Punnamada Lake (Kuttanad), and Kochi Lake (Kochi)**, it is formed by the confluence of four rivers—**Meenachil, Achankovil, Pampa, and Manimala**—and opens into the Arabian Sea.

Significance

- Surrounds the islands of Pathiramanal, Perumbalam, and Pallippuram.
- Hosts the **Nehru Trophy Boat Race (Vallam Kali)** annually in August.
- Houses the **Kumarakom Bird Sanctuary** on its eastern shore.
- Declared a **Ramsar site** of international importance in 2002.

Particularly Vulnerable Tribal Groups (PVTGs)

Originally categorized as **Primitive Tribal Groups (PTGs)** by the Dhebar Commission in 1973, the classification was later renamed **PVTGs** in 2006. These communities are among the most marginalized tribal groups in India.

Characteristics of PVTGs

- Low literacy rates, geographical isolation, and economic backwardness.
- Primitive subsistence methods, including hunting and pre-agricultural technologies.
- Zero to negative population growth.

Due to the exploitation of development funds by more advanced tribal groups, greater financial assistance is needed for PVTGs. As per the 2011 Census, **Odisha** has the largest PVTG population, followed by **Madhya Pradesh**.

Maiya Samman Yojana

This scheme enhances financial assistance for women aged **18 to 50**, increasing the support from ₹**1,000 to ₹2,500** per beneficiary. Additionally, it promotes financial inclusion by requiring women to have bank accounts. The ₹**2,500 instalment for December has already been transferred**, with January's payment pending.

Coffee Production in India
India is the world's **eighth-largest** coffee producer, cultivating two primary varieties:
- **Arabica** – Milder in flavour and commands a higher market price.
- **Robusta** – Stronger in taste, commonly used in blends.

Regional Production
- **Karnataka** – Largest producer (71%)
- **Kerala** – Second-largest (20%)
- **Tamil Nadu** – 5%, mainly from Nilgiris
- Minor production in **Odisha** and **Northeastern states**

Panch Pran (Five Pillars of National Transformation)
Introduced by **Prime Minister Narendra Modi** during his **2022 Independence Day speech**, **Panch Pran** outlines five pledges to guide India toward becoming a developed nation by **2047**:
1. **Social Harmony** – Strengthening national unity through diversity.
2. **Family Enlightenment** – Instilling patriotic values at the grassroots level.
3. **Environmental Consciousness** – Protecting nature as a tribute to Bharat Mata.
4. **Swadeshi & Self-Reliance** – Promoting **Atmanirbhar Bharat** and indigenous development.
5. **Civic Duties** – Encouraging responsible citizenship for national progress.

Nitrogen Use Efficiency (NUE)
NUE refers to how effectively a plant utilizes nitrogen, whether from fertilizers or atmospheric fixation, to produce biomass. It is the ratio of crop yield to nitrogen absorbed by the plant. Improving NUE is crucial in crop breeding to enhance productivity while reducing fertilizer costs and minimizing environmental nitrogen pollution.

Challenges with Traditional Methods:
- Increased operational expenses for farmers.

- Environmental issues such as nitrogen oxide emissions from fertilizer production, contribute to global warming.

Role of Nitric Oxide (NO):
- Regulates essential physiological processes in plants.
- Activates nitrate transporters, aiding nitrogen absorption, especially in low-nitrogen conditions.

Toda Tribe

One of the oldest ethnic groups in the Nilgiris Hills, Tamil Nadu, the Toda community consists of five clans: Paiki, Pekkan, Kuttan, Kenna, and Todi.

Key Aspects:
- **Language:** Spoken but lacks a script.
- **Settlement:** They live in small hamlets called *munds*.
- **Social Structure:** Patrilineal society is divided into two endogamous groups—Tharthazoll and Theveioll.
- **Traditional Governance:** The *Noim*, led by a headman called *Monegar*, governs and administers justice within the community.
- **Festival:** Celebrate *Modhweth* (Buffalo Festival) annually in late December or early January.

Twigstats

A computational tool for high-resolution ancestry analysis, Twigstats enhances statistical power and reduces errors in genetic studies. It is coded in C++ and integrates R for statistical analysis, enabling researchers to investigate historical genetic links more accurately.

Genetic Analysis Techniques
- **Single Nucleotide Polymorphisms (SNPs):** Used to trace genetic histories but requires high-quality DNA.
- **Haplotypes Method:** Examines genetic similarity through shared ancestry, incorporating time-based genetic information.
- **Genealogical Tree Inference:** Analyzes modern and ancient genomes to determine population structures and demographic trends.

Tipeshwar Wildlife Sanctuary

Located in Yavatmal, Maharashtra, this sanctuary is nourished by rivers like Purna, Krishna, Bhima, and Tapti, earning it the title *Green Oasis of Southern Maharashtra*. The region features basaltic terrain formed by ancient lava eruptions and varied vegetation due to its hilly landscape.

Sri Ranganathaswamy Temple
Situated in Srirangam, Tamil Nadu, this temple is India's largest functioning Hindu temple, covering 156 acres. Dedicated to Lord Vishnu (*Ranganatha*), it has been a major spiritual site since the 2nd century BCE.
Architectural Features:
- Built in the **Dravidian** style.
- 7 enclosures with massive walls.
- 21 elaborately sculpted *gopuras* (towers).
- 50 sub-shrines, 9 sacred pools, and a golden *Vimana* (dome).
- The **Rajagopura** (main tower) is India's tallest temple tower at 236 feet.
- The 1000-pillared hall, built during the Vijayanagara period, features intricate carvings.

UJALA Scheme & SLNP
- **UJALA (Unnat Jyoti by Affordable LEDs for All):**
  - Originally launched as the **Domestic Efficient Lighting Programme (DELP)**.
  - Provides affordable LED bulbs, tube lights, and fans to promote energy efficiency.
  - Implemented by **Energy Efficiency Services Limited (EESL)** under the Ministry of Power.
- **Street Lighting National Programme (SLNP):**
  - Launched alongside UJALA in 2015.
  - Replaces conventional streetlights with LED lights to reduce energy consumption and costs.

Production-Linked Incentive (PLI) Scheme
Initially introduced for three sectors during COVID-19 to boost domestic manufacturing, the scheme was later expanded to include speciality steel in 2021. The goal is to

promote high-value steel production, enhance technological capabilities, and strengthen India's industrial value chain.

Anji Khad Bridge
- **Location:** Anji River Valley, linking Katra and Reasi in Jammu & Kashmir.
- **Part of:** Udhampur-Srinagar-Baramulla Rail Link (USBRL) project.
- **Length:** 725.5 meters, with a 473.25-meter cable-stayed span.
- **Height:** 331 meters above the riverbed.

Selective Silencing
A genetic phenomenon where one parental copy of a gene is deactivated in certain cells, affecting gene expression.
Implications:
- Prevents disease expression in individuals carrying genetic risk factors.
- Helps regulate various biological functions and inheritance patterns.

AnemiaPhone
Developed by Cornell University, this portable diagnostic tool rapidly detects iron deficiency through a small blood sample on a test strip. The results are uploaded via mobile devices for instant clinical analysis. ICMR has integrated it into India's anaemia prevention programs, particularly benefiting pregnant women.

Global Energy Alliance for People and Planet (GEAPP)
A coalition of governments, businesses, and philanthropists promoting clean energy transitions in developing nations.
Objectives:
- Reduce 4 gigatons of future carbon emissions.
- Expand clean energy access to 1 billion people.
- Create 150 million jobs in sustainable energy.

Pravasi Bharatiya Divas (PBD)
A biennial event organized by the **Ministry of External Affairs** to connect the Indian diaspora with India's development initiatives.
- **Significance:** Celebrated on January 9th, marking Mahatma Gandhi's return to India from South Africa (1915).

● **Themes:** Focus on the diaspora's role in building a developed India (*Viksit Bharat*).

Indo-Tibetan Border Police (ITBP)
● Formed in **1962** post-Sino-Indian war to protect the 3,488 km India-China border.
● Initially under the **CRPF Act**, later formalized by the ITBP Act (1992).
● Specialized **mountain force**, with personnel trained in mountaineering and skiing.
● Motto: *Shaurya-Dridhata-Karma Nishtha* (Valour, Determination, Duty).
● Headquarters: **New Delhi**.

EmpowHER Biz Initiative
A **NITI Aayog-led** program under the Women Entrepreneurship Platform, focusing on training women in retail management, finance, and digital skills.
● 50 women (aged 18–35) selected through an online application.
● The top 20 receive a **100% waiver on New Shop franchise fees**, enabling them to start retail businesses.
● Targeted at women from **Delhi NCR, Punjab, Rajasthan, UP, Haryana, MP, and Gujarat**.

Soapstone
A soft, heat-resistant **metamorphic rock** primarily composed of **talc**.
● **Uses:** Countertops, sinks, sculptures, and industrial applications (cosmetics & pharmaceuticals).
● **Major Reserves in India: Rajasthan (57%) and Uttarakhand (25%)**.

Classical Languages of India
Recognized by the Government of India, these languages have rich literary traditions and historical significance:
1. Tamil (2004)
2. Sanskrit (2005)
3. Kannada (2008)
4. Telugu (2008)
5. Malayalam (2013)

6. Odia (2014)

Bhashini Project
Launched in 2022 under the **National Language Translation Mission (NLTM)**, it aims to provide:
- **Indian language-based internet access** (including voice-based services).
- **Localized content creation** in regional languages.

World Economic Forum (WEF)
- Established in **1971** by **Klaus Schwab**, headquartered in **Davos, Switzerland**.
- A global platform bringing together **business, government, and civil society leaders** to address economic and environmental challenges.

Androgen Signaling
Androgens (like **testosterone**) influence:
- Male secondary characteristics (facial hair, deep voice).
- Muscle growth and strength.
- Reproductive health (sperm production).
- Brain functions (mood, cognition, behaviour).

Trichophyton indotineae Trichophyton indotineae is a fungal pathogen responsible for persistent skin infections, primarily reported in India. It was named in 2020 by a Japanese research group based on isolates from India and Nepal, following the convention of naming new pathogens after their place of discovery. The fungus has now been identified in over 40 countries and belongs to the dermatophyte group, which causes dermatophytosis—an infection affecting the skin, hair, and nails. Indotineae results in itchy and inflamed skin conditions, mainly in the groin, gluteal region, trunk, and face, affecting people of all ages and genders. It spreads through direct contact with infected skin or contaminated objects like clothing and towels. Moreover, it has developed resistance to first-line antifungal treatments.

Keoladeo National Park
Formerly known as the Bharatpur Bird Sanctuary, Keoladeo National Park is located in eastern Rajasthan. It was designated a national park in 1981 and renamed after an

ancient Shiva temple within the park. Positioned along the Central Asian migratory flyway, it covers 2,873 hectares, comprising woodlands, grasslands, wetlands, and swamps. The park holds international significance as a Ramsar site and a UNESCO World Heritage Site.

UN Committee of Experts on Big Data and Data Science for Official Statistics

India recently joined the UN Committee of Experts on Big Data and Data Science for Official Statistics (UN-CEBD), established in 2014 with Australia as its first chair. The committee examines the benefits and challenges of Big Data, particularly its role in monitoring and reporting on sustainable development goals.

Governance Structure:

- **Advisory Board**: The main decision-making body, which convenes approximately four times a year to oversee and guide the committee's work.
- **UN Bureau**: Responsible for the committee's daily operations.

Blue Flag Certification

Kerala's Kappad Beach in Kozhikode and Chal Beach in Kannur have been awarded the prestigious Blue Flag certification by the Denmark-based Foundation for Environmental Education (FEE). This globally recognized eco-label, launched in France in 1985 and expanded beyond Europe in 2001, is one of the world's top voluntary awards for beaches, marinas, and sustainable tourism boats. It promotes environmental sustainability through four key criteria: water quality, environmental management, environmental education, and safety.

Several Indian beaches have received this certification, including Shivrajpur (Gujarat), Ghoghla (Diu), Kasarkod and Padubidri (Karnataka), Rushikonda (Andhra Pradesh), Golden Beach (Odisha), Radhanagar (Andaman & Nicobar), Kovalam (Tamil Nadu), Eden Beach (Puducherry), Minicoy Thundi Beach, and Kadmat Beach (Lakshadweep).

INS Vaghsheer

INS Vaghsheer is the sixth submarine in the first batch of Kalvari-class submarines built for the Indian Navy. Named after the sandfish, a formidable deep-sea predator, the submarine was launched in April 2022. It has undergone extensive trials to assess its endurance, stealth capabilities, and combat efficiency.

Silver Notice (Interpol)

The Silver Notice is a new addition to Interpol's colour-coded alert system, aimed at tracking and recovering assets linked to criminal activities such as fraud, corruption, drug trafficking, and environmental crimes. This initiative helps countries trace illicitly acquired wealth across borders. The project, launched at Italy's request to locate a senior mafia member's assets, currently involves 52 nations, including India. It is set to run until at least November 2025, with 500 notices available for issuance among participating countries.

Indravati National Park Indravati National Park, located in Chhattisgarh's Bijapur district, was established in 1981 and later declared a tiger reserve in 1983 under India's Project Tiger initiative. The park is named after the Indravati River, which forms its northern boundary with Maharashtra. It features undulating hilly terrain with altitudes ranging from 177 to 599 meters above sea level and comprises three major forest types: Moist Mixed Deciduous Forest with and without teak, as well as Southern Dry Mixed Deciduous Forest.

Universal Account Number (UAN)

The Universal Account Number (UAN) is a unique 12-digit identifier assigned to all salaried employees contributing to the Employees' Provident Fund (EPF). Issued by the Employees' Provident Fund Organisation (EPFO) and authenticated by the Ministry of Labour and Employment, it remains constant throughout an individual's career. While employees receive different Member Identification Numbers (Member IDs) for each job, their UAN links all these accounts, simplifying fund management and tracking job transitions.

Employee Provident Fund (EPF)

The EPF, established under the Employees' Provident Funds and Miscellaneous Act of 1952, is managed by the EPFO. It applies to establishments with 20 or more employees, although smaller organizations may also be covered under specific conditions. Both employer and employee contribute 12% of the employee's basic salary and dearness allowance to the fund. Upon retirement, the employee receives the accumulated amount, including contributions and accrued interest.

Neduntheevu Island (Delft Island)

Neduntheevu, also known as Delft Island, is the largest island in Sri Lanka's Palk Strait. Covering 50 square kilometres, it has a length of 8 km and a width of about 6 km. The island is uniquely flat, windswept, and largely devoid of streams, relying on surface water collected in natural depressions and artificial ponds. It features dry shrubs, semi-arid tropical plants, and tall palm trees, giving it a distinct coastal ambience. A historic Dutch fort, constructed from dead coral, is also located here. The island is home to around 4,800 Tamil residents, mainly concentrated in its northern half.

Surface-enhanced Raman Spectroscopy (SERS)
Surface-enhanced Raman Spectroscopy (SERS) is an advanced technique that amplifies Raman scattering signals from molecules adsorbed on rough metal surfaces, typically gold or silver. Compared to conventional Raman spectroscopy, SERS significantly enhances signal strength, making it invaluable in chemical, material, and life sciences research.

What is Raman Spectroscopy?
Raman Spectroscopy is a technique used in physics and chemistry to analyze vibrational, rotational, and other low-frequency modes of molecules. It relies on Raman scattering—where light interacts inelastically with a material. Discovered by Indian physicist C. V. Raman in 1928, it has wide applications in material analysis.

Pink Fire Retardant
Fire retardants are chemical mixtures designed to suppress or slow down the spread of fires. A widely used brand, Phos-Chek, consists of ammonium phosphate-based slurry, which adheres to vegetation, creating a barrier against fire. The pink colour is added to enhance visibility, aiding firefighters in targeting specific areas effectively.

Environmental Concerns:
Experts have raised concerns about the aerial spraying of fire retardants, citing inefficiency, high costs, and pollution risks. Research suggests that Phos-Chek contains toxic metals like chromium and cadmium, which can contaminate water bodies, harm aquatic life, and pose serious health risks, including cancer and kidney diseases.

Indian Harvest Festivals
- ● **Lohri:** Celebrated in Punjab, Haryana, Himachal Pradesh, and Jammu & Kashmir, it marks the end of the winter solstice and the harvest of rabi crops.

- **Makar Sankranti:** Observed across India, it signifies the northward movement of the Sun (Uttarayan) and the transition from winter. It is known as Poush Sankranti in Bengal, Sukarat in Central India, and Makar Sankranti in South and West India.
- **Magh Bihu (Assam):** Celebrates the conclusion of the harvest season and the arrival of spring.
- **Pongal (Tamil Nadu):** A four-day festival dedicated to the Sun God, marking the harvest and Uttarayan. The celebrations include Bhogi (cleaning), Surya Pongal (Sun worship), Maattu Pongal (honouring cattle), and Kanum Pongal (social visits).

Lal Bahadur Shastri Lal Bahadur Shastri actively participated in the Indian independence movement and joined the Indian National Congress. Born as Lal Bahadur Shrivastava, he later dropped his surname in opposition to the caste system. After graduating from Kashi Vidyapeeth, Varanasi, in 1925, he was conferred the title 'Shastri,' signifying a scholar. He became India's second Prime Minister in 1964. To enhance food production, he championed the Green Revolution in 1965, which significantly increased grain output, especially in Punjab, Haryana, and Uttar Pradesh. His slogan 'Jai Jawan, Jai Kisan' inspired both soldiers and farmers during a period of food scarcity. He signed the Tashkent Declaration on January 10, 1966, with Pakistan's General Ayub Khan, facilitated by the Soviet Union, to promote long-term peace.

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). Established in 2014, with Australia as the first chair, this panel comprises 31 member states and 16 international organizations. An annual plenary meeting is held alongside the Conference on Big Data for Official Statistics to assess activities and initiatives.

Pink Fire Retardant
This chemical mixture is designed to slow or extinguish fires by cutting off oxygen supply to flames. The pink colour improves visibility, aiding firefighters in targeting affected areas. Phos-Chek, widely used in the U.S. for wildfire control, is an ammonium

phosphate-based slurry that coats vegetation to create fire barriers. However, research indicates it contains toxic metals like chromium and cadmium, posing risks to humans and aquatic ecosystems.

Hollongapar Gibbon Wildlife Sanctuary

Located in Jorhat, Assam, this sanctuary is the only one in India named after a gibbon due to its high gibbon population density. It is home to India's only gibbons—the hoolock gibbons—and Northeast India's only nocturnal primate, the Bengal slow loris. The sanctuary has semi-hydrophytic vegetation near the Bhogdoi River, forming a waterlogged region.

Small Language Models (SLMs)

SLMs are compact AI models designed for Natural Language Processing (NLP) tasks. Compared to Large Language Models (LLMs) like GPT-3, SLMs have fewer parameters, making them efficient and suitable for applications with limited computing resources. They are designed for specific language-related tasks using curated data sources.

Diego Garcia

A coral atoll in the Chagos Archipelago, Diego Garcia is the largest island in the British Indian Ocean Territory (BIOT). Initially a dependency of Mauritius, it was separated in 1965 to form BIOT. In 1966, the UK leased it to the U.S. for military use, leading to the displacement of its inhabitants. A 2019 UN General Assembly resolution called for its return to Mauritius, a move recently agreed upon by the UK government.

Makaravilakku Festival

Celebrated at Kerala's Sabarimala Temple on Makara Sankranti, this festival marks the culmination of the annual pilgrimage. The Thiruvabharanam, or sacred ornaments of Lord Ayyappa, are brought from the Pandalam Palace to the temple. A key feature of the festival is the appearance of the Makara Jyothi, believed to be a divine light manifestation. The seven-day event concludes with the 'Guruthi' ritual.

Bharat Cleantech Manufacturing Platform

This initiative, launched by India's Commerce & Industry Ministry, aims to strengthen cleantech value chains in solar, wind, hydrogen, and battery storage. It fosters collaboration, innovation, and financing to position India as a leader in sustainability.

India's Clean Energy Goals

India aims to achieve 500 GW from clean energy sources by 2030. It has been proactive in fulfilling its Nationally Determined Contributions (NDCs) and exceeded its renewable energy target by reaching 200 GW in 2022. India also boasts the world's largest interconnected power grid.

Ranthambhore Tiger Reserve

Situated at the convergence of the Aravalis and Vindhyan ranges in Rajasthan, Ranthambhore was once a royal hunting ground. It is among the top locations for tiger conservation due to its climate and vegetation. The Chambal River to the south and the Banas River to the northbound the reserve. The historic Ranthambore Fort, a UNESCO World Heritage Site, is located within its premises.

Nag Mk 2 Missile

An advanced, indigenously developed anti-tank guided missile, the Nag Mk 2 features third-generation fire-and-forget technology for precision targeting. It is effective against modern armoured vehicles with explosive reactive armour (ERA) and integrates with NAMICA for enhanced battlefield mobility.

Sada in the Konkan Region

Sada are lateritic plateaus in the Konkan region, formed by erosion. These mostly barren landscapes support endemic flora during monsoons. Traditional rice and millet cultivation occurs without chemicals. The porous soil aids groundwater recharge, providing fresh water throughout the year. However, threats such as mining and development projects endanger these ecosystems, which are classified as 'wastelands' in the Wasteland Atlas.

Real Estate Investment Trusts (REITs)

REITs are investment vehicles that pool funds from multiple investors to own and operate income-generating real estate. They offer a liquid way to invest in real estate, enabling diversification and regular income along with capital appreciation.

Infrastructure Investment Trusts (InvITs)

Similar to REITs, InvITs pool funds for infrastructure projects like highways and power

plants. They provide regular income through dividends while attracting private investment in public infrastructure.

Municipal Bonds

Issued by urban local bodies (ULBs), municipal bonds finance infrastructure and civic projects. These tax-free bonds help municipalities raise funds while offering fixed returns to investors.

Atomic Energy Commission (AEC)

Founded in 1948 under Dr. Homi J. Bhabha's leadership, the AEC oversees India's nuclear policies. It formulates nuclear development strategies, promotes research, regulates nuclear activities, ensures safety, and facilitates international collaboration. The Prime Minister serves as its ex-officio chairman.

India's Greenhouse Gas (GHG) Emissions Drop

India's 4th Biennial Update Report (BUR-4) to the UNFCCC revealed a 7.93% reduction in GHG emissions in 2020 compared to 2019. India's historical share of global emissions is 4%, despite accounting for 17% of the world's population. Its per capita energy consumption remains lower than most countries.

India's Nationally Determined Contribution (NDC) Targets

By 2030, India aims to reduce its GDP's emissions intensity by 45% from 2005 levels, derive 50% of its energy from non-fossil sources, and create a 2.5–3 billion-ton CO_2 equivalent carbon sink. It pledged to reach net-zero emissions by 2070 at COP 26.

Purulia Observatory

Located on Panchet Hill in Purulia District, West Bengal, this observatory is equipped with a 14-inch diameter telescope for scientific studies. Situated at an elevation of 600 meters and approximately 86° E longitude, it is set to become a significant observatory in eastern India and globally. The observatory will fill a gap along the 86° East longitude, aiding in astronomical observations and student training in telescope operations and data recording.

Other Major Observatories in India:

- ● ARIES Observatory, Nainital (Uttarakhand)
- ● Vainu Bappu Observatory, Kavalur (Tamil Nadu)

● Indian Astronomical Observatory (IAO), Hanle (Ladakh)

Sada (Flat Top Terrain)
A 'Sada' is a large, flat expanse formed over centuries of erosion, primarily found in Maharashtra's Konkan region. These are similar to 'Pathar' plateaus like the Kaas Plateau in the Satara district.
Characteristics:
- Barren for most of the year but flourish during monsoons
- Composed of highly weathered lateritic soil, which aids in rainwater collection and groundwater recharge
- Hosts unique endemic flora and diverse wildlife, including 459 plant species (105 endemic), 31 reptile species, 13 amphibian species, 169 bird species, and 41 mammal species
- Contains ancient geoglyphs estimated to be around 10,000 years old

National Turmeric Board
The board has been established to oversee turmeric-related matters, improve coordination with the Spices Board, and boost the development of the turmeric sector.
Composition:
- Chairperson appointed by the Central Government
- Secretary appointed by the Department of Commerce
- Members from ministries including AYUSH, Pharmaceuticals, Agriculture, and Commerce
- Representatives from top turmeric-producing states (Maharashtra, Telangana, Meghalaya, and others on a rotational basis)
- Research institutions, turmeric farmers, and exporters

Mandate: The board will focus on R&D, turmeric product enhancement, increasing awareness of its medicinal benefits, improving yields, optimizing supply chains, and expanding international markets. Quality and safety assurance will also be a priority.
Headquarters: Nizamabad, Telangana

Turmeric Production in India
Known as the "Golden Spice," turmeric holds immense economic value for Indian farmers. India accounts for over 70% of global turmeric production, cultivating 30 varieties.

Leading Producing States: Maharashtra, Telangana, Karnataka, Tamil Nadu Top Export Markets: Bangladesh, UAE, USA, Malaysia

Falcated Duck

Also called the falcated teal (*Mareca falcata*), this dabbling duck originates from eastern Siberia, Mongolia, and northern Japan, migrating to Southeast Asia and eastern India in winter. Sightings in India are rare.

Habitat & Diet:

- Found in freshwater lakes, ponds, rivers, and marshes surrounded by forests
- Nest on the ground near water, breeding from May to early July
- Primarily herbivorous but occasionally consume small invertebrates and mollusks

Conservation Status: Near Threatened (IUCN)

Threats: Hunting for meat and feathers

Telecom Technology Development Fund

Established under the Universal Services Obligation Fund (USOF), now called Digital Bharat Nidhi, by the Department of Telecom, this fund aims to foster research, design, prototyping, and manufacturing of telecom-related products in India.

Objectives:

- Support R&D in rural-specific telecom applications
- Encourage collaborations between academia, startups, research institutions, and industries
- Promote Indigenous technology ownership and reduce dependence on imports

Eligible Entities:

- Domestic companies focused on telecom R&D
- Startups, MSMEs, academic institutions
- R&D organizations, Section 8 companies, government entities, PSUs, and partnerships engaged in telecom research

Kerch Strait A waterway in Eastern Europe connecting the Sea of Azov and the Black Sea, the Kerch Strait lies between Crimea's Kerch Peninsula (annexed by Russia in 2014) and Russia's Taman Peninsula. Named after the Crimean city of Kerch, historically called the Cimmerian Bosporus.

Key Infrastructure:
- Kerch Strait Bridge: Connects Crimea to mainland Russia

Autism Spectrum Disorder (ASD)
A neurological condition affecting communication, behaviour, and learning due to disruptions in brain signalling.
Causes: Genetic and environmental factors, including maternal health and birth complications, genetic disorders (e.g., Fragile X syndrome), and environmental triggers (e.g., air pollution)
Prevalence:

- Estimated global prevalence: ~1% (WHO)
- Increased from 0.62% in 2012

Credit-Deposit Ratio (CDR)
A financial metric used to assess a bank's liquidity by comparing total loans to total deposits.
Ideal Range: 80%–90%

- High CDR: Indicates aggressive lending, boosting profitability but increasing risk.
- Low CDR: Reflects conservative banking, holding higher reserves and fewer lending opportunities

Army Day
Observed annually on January 15, commemorating the appointment of General KM Cariappa as India's first Commander-in-Chief in 1949. On this day, he took over from General Sir FRR Bucher, marking India's military independence. Cariappa also led Indian forces in the 1947 Indo-Pak war.

Green Energy Open Access Rules, 2022
Formulated to promote the generation, purchase, and consumption of green energy, including energy from waste-to-energy plants.
Key Features:

- Open access allowed for all consumers
- The minimum transaction limit was reduced from 1 MW to 100 kW to include small consumers
- Consumers can demand green power supply from distribution companies

- Discoms must procure and supply green power to eligible consumers
- Commercial and industrial consumers can voluntarily purchase green power
- A uniform Renewable Purchase Obligation (RPO) applies to all distribution license areas
- Green Hydrogen and Green Ammonia are included in the RPO fulfilment criteria

Central Suspect Registry:
The Central Suspect Registry is an initiative to enhance cyber fraud risk management by compiling a database of identifiers. It is based on the National Cybercrime Reporting Portal (NCRP) and contains information on 1.4 million cybercriminals involved in financial fraud and other cyber offences. Developed by the Indian Cyber Crime Coordination Centre (I4C), the registry is accessible to states, union territories, and central investigative and intelligence agencies. Banks and financial institutions collaborated to create this consolidated cybercrime suspect database.

Indian Cyber Crime Coordination Centre (I4C):
Established under the Ministry of Home Affairs (MHA), I4C coordinates and manages cybercrime issues in India. It serves as a nodal point for cybercrime prevention, supports law enforcement agencies (LEAs) with research and forensic tools, and prevents the misuse of cyberspace by extremist and terrorist groups. Located in New Delhi, I4C promotes cooperation between stakeholders and law enforcement.

Electrokinetic Mining:
This innovative mining technique utilizes electrokinetics—the application of an electric field—to accelerate the movement of metals, water, and particles. Currently, heavy rare earth elements (HREE) are primarily extracted from ion-adsorption rare earth deposits (IADs) in South China using ammonium-salt-based leaching agents, which harm the environment and have low efficiency. Electrokinetic mining reduces leaching agent use by 80% and energy consumption by 60%, while achieving a recovery rate exceeding 95%, making it more sustainable and efficient.

Sydney Funnel-Web Spider:
A highly venomous spider, the Sydney funnel-web has a glossy dark brown to black body with distinct silk-spinning organs. Males carry more potent venom, responsible for human fatalities. These spiders inhabit bushy suburban areas, forests, and woodlands, particularly on shaded slopes and gullies. The broader funnel-web spider group includes

36 species categorized under the Hadronyche, Atrax, and Illawarra genera. Their venom contains over 40 toxic proteins.

Atomic Energy Commission (AEC):
The AEC governs India's Department of Atomic Energy (DAE), which was established on August 3, 1954. The commission formulates policies and oversees atomic energy-related affairs. The DAE functions directly under the Prime Minister, and the AEC chairman is the ex-officio secretary of the DAE. Headquarters: Mumbai, Maharashtra.

Kokborok Language:
Spoken by the Borok people (Tripuris) in Tripura, Kokborok was officially recognized as one of the state's languages on January 19, 1979. As per the 2011 Census, 8,80,537 people (23.97% of Tripura's population) speak Kokborok.

Kashi Tamil Sangamam:
The third edition of Kashi Tamil Sangamam (KTS) will begin on February 15, 2025, in Varanasi, Uttar Pradesh. Organized by the Ministry of Education in collaboration with IIT Madras and Banaras Hindu University (BHU), the event celebrates the historical ties between Tamil Nadu and Kashi. It aligns with the NEP 2020 focus on integrating Indian knowledge systems and has been recognized under UNESCO's 'Creative Cities of Music' category.

Tharu Community:
An indigenous ethnic group residing in Nepal's Terai region and parts of Uttar Pradesh, Bihar, and Uttarakhand in India, the Tharus speak Tharu or Tharuhati, an Indo-Aryan language. They were recognized as a Scheduled Tribe by the Indian government in 1967.

Siachen Glacier: The world's second-longest non-polar glacier, after Tajikistan's Fedchenko Glacier, Siachen lies in the Karakoram Range. Originating near Indira Col West, it feeds the Nubra River, a tributary of the Shyok River (part of the Indus system). India secured the glacier in 1984 under Operation Meghdoot.

Blood Money:

A Yemen court's death sentence for an Indian-origin nurse has brought attention to 'blood money' (diyya), a compensation system under Islamic Sharia law. This practice allows monetary settlements for unintentional murder or culpable homicide, leaving the offender's fate to the victim's family. India's legal system does not formally recognize blood money but permits plea bargaining.

Kampala Declaration Objectives:
- Sustainable food production, agro-industrialization, and trade.
- Increased investment and financing for agrifood systems.
- Strengthened food security and nutrition.
- Inclusivity and equitable livelihoods.
- Resilient agrifood systems and governance.

Malabo Declaration:

Adopted in 2003 at the African Union Assembly in Maputo, Mozambique, this declaration launched the Comprehensive Africa Agriculture Development Programme (CAADP) to promote agricultural development and food security in Africa.

Indian Naval Platforms:
- INS Nilgiri: Lead ship of Project 17A frigates, honouring the Chola dynasty.
- INS Vagsheer: The sixth and final submarine of the P75 Scorpene Project, built in collaboration with France's Naval Group.
- INS Surat: Fourth and final ship of its project, a state-of-the-art destroyer with 75% indigenous content, highlighting Gujarat's maritime history.

Similipal National Park:

One of India's largest biospheres, it became a tiger reserve under Project Tiger (1973) and a Biosphere Reserve in 1994. Named after the Simul (silk cotton) tree, it was added to UNESCO's Biosphere Reserve list in 2009. Notable for having the world's highest black tiger sightings.

Bharat Ranbhoomi Darshan:

A website showcasing historical battle sites such as Galwan (2020) and Doklam (2017).

Features virtual tours, narratives, and interactive content. The Tourism Ministry will promote these sites under the Incredible India campaign.

Dark Oxygen:
Oxygen is produced deep underwater without photosynthesis. It is released by polymetallic nodules, which contain manganese, iron, cobalt, nickel, copper, and lithium. These nodules generate oxygen through electrochemical activity by splitting water molecules.

Trajan Gun:
A 155mm towed artillery gun system developed by India (L&T) and France (KNDS). With a range exceeding 40 km, it features modular design, advanced targeting, and fire-control systems. Suitable for diverse terrains, it integrates seamlessly with modern military networks.

Planet Parade:
A celestial event where multiple planets align in the night sky, appearing close together due to perspective rather than actual alignment in space. Such conjunctions, especially involving four or more planets, are rare and significant.

Indian Sustainable Natural Rubber (iSNR) Platform:
Launched by the Rubber Board, iSNR ensures compliance with the EU Deforestation Regulation (EUDR) by issuing traceability certificates for rubber origins. INR Konnect is a web-based platform linking growers with adopters to maximize plantation productivity and provide training in sustainable practices.

Exercise La Perouse:
A multilateral maritime exercise in the Indian Ocean Region, conducted biennially by the French Navy. The fourth edition features India's guided missile destroyer INS Mumbai.

Krishna River
The Krishna River ranks as the fourth largest river in India, following the Ganga, Godavari, and Brahmaputra in terms of water inflows and basin area. Originating from the Western Ghats near Mahabaleshwar in Maharashtra, about 64 km from the Arabian

Sea, it flows through Maharashtra, Karnataka, Telangana, and Andhra Pradesh before emptying into the Bay of Bengal at Hamasaladeevi, Andhra Pradesh.

- Total Length: 1300 km
- Basin Area: 258,948 sq. km (approximately 8% of India's total area)
- Boundaries: Balaghat range (north), Eastern Ghats (south & east), Western Ghats (west)
- Right Tributaries: Ghatprabha, Malprabha, Tungabhadra
- Left Tributaries: Bhima, Musi, Munneru

Lake Naivasha

Lake Naivasha, a shallow freshwater lake in Kenya's southern Rift Valley, faces ecological threats from invasive water hyacinths. This species, introduced in the 1980s, thrives in contaminated environments, spreading rapidly and disrupting the lake's ecosystem.

- Impact of Water Hyacinth: Blocks sunlight, reduces airflow, and affects aquatic life.
- Geological Origin: Recent, surrounded by extinct and dormant volcanoes.

National Disaster Response Force (NDRF)

Established under Section 44 of the Disaster Management Act (2005), the NDRF specializes in responding to natural and man-made disasters, including floods, cyclones, earthquakes, landslides, and accidents. Its proactive deployment strategy has significantly mitigated disaster-related damage.

- International Missions: Assisted in Japan's Fukushima disaster (2011) and Nepal's earthquake (2015).
- Governance: Functions under the Ministry of Home Affairs (MHA), led by a Director General.

World Economic Forum (WEF)

Founded in 1971 by German economist Klaus Schwab, WEF promotes stakeholder capitalism and fosters global economic cooperation through discussions and commitments.

- Former Name: European Management Forum
- Funding: Primarily from partner corporations (typically exceeding $5 billion in revenue).

- Key Reports: Global Competitiveness Report, Global Gender Gap Report, Global Risks Report, etc.
- Headquarters: Geneva, Switzerland (with offices in New York, San Francisco, Beijing, and Tokyo).

Great Barrier Reef

The Great Barrier Reef, located in the Coral Sea off Australia's northeastern coast, is the world's largest coral reef system, covering about 10% of global coral reef ecosystems.

- Unique Species: Home to dugongs and large green turtles, both of which face extinction threats.
- Protection: Managed by the Great Barrier Reef Marine Park Authority (Australia); designated as a UNESCO World Heritage Site in 1981.

Kalaripayattu

Kalaripayattu, an ancient martial art from Kerala, is recognized for its scientific approach to physical and mental discipline.

- Mythological Origins: Believed to be introduced by Lord Parasurama.
- Historical Development: Dates back to 200 BCE–600 CE, with peak prominence in the 14th–16th centuries.
- Training Stages: Maippayattu (body conditioning), Kolthari (wooden weapons), Angathari (metal weapons), Verumkai (barehand combat).

BRICS

BRICS is an intergovernmental organization promoting economic cooperation among emerging economies.

- Members: Brazil, Russia, India, and China (founding members); later joined by South Africa (2010), Iran, UAE, Egypt, Ethiopia, Saudi Arabia (2024), and Indonesia (2025).
- Significance: Represents ~40% of the global population and ~37.3% of global GDP.

Securities Transaction Tax (STT)

STT is a direct tax levied on the purchase and sale of securities on recognized Indian stock exchanges.

- Introduced: 2004 (replacing the earlier stamp duty system).

● Budget 2024 Changes: Increased STT on Futures & Options (F&O) to 0.02% and 0.1%, respectively.

Nord Stream Pipeline
Nord Stream is a major undersea gas pipeline transporting Russian natural gas to Europe.
● Key Routes:
  ○ Nord Stream 1 (2011): Vyborg (Russia) to Lubmin (Germany).
  ○ Nord Stream 2 (2021): Ust-Luga (Russia) to Lubmin (Germany).

Surgical Tele-Robotic System
SSI Mantra, India's first Indigenous surgical telerobotic system, successfully conducted heart surgeries remotely between Jaipur and Gurgaon.
● Developed By: SSI Ltd.
● Approved By: Central Drugs Standard Control Organisation (CDSCO).
● Advantages: Reduced operation time, better precision, minimal trauma, faster recovery.
● Challenges: High cost, latency issues, dependence on strong connectivity.

Contract Farming
Contract farming is a pre-agreed arrangement between farmers and buyers, specifying pricing, quantity, quality, and delivery terms.
● Farmer Benefits: Financial support, secured market, reduced risks, access to new technology.
● Challenges: Limited market flexibility, delayed payments, environmental concerns, unequal bargaining power.

Australopithecus
Australopithecus is an extinct primate genus considered a close relative of Homo.
● Physical Traits: Apelike features, small brain (~500 cc), strong arms, bipedal locomotion.
● Diet: Primarily plant-based (leaves, fruits, seeds, roots, insects).

National Board for Wildlife (NBWL)

Established under the Wildlife (Protection) Act (1972), NBWL advises the government on wildlife conservation and project approvals.

- ● Key Functions: Protection of wildlife habitats, approvals for projects in Protected Areas (PAs).
- ● Governance: Chaired by the Prime Minister; includes a 47-member committee.

Standing Committee of NBWL

An independent body under NBWL focused on project clearances.

- ● Leadership: Chaired by the Minister of Environment, Forest, and Climate Change.
- ● Distinction: NBWL sets policies, while its Standing Committee grants project approvals.

Narayana Guru's Contributions

- ● Temple Entry Movement: Led efforts for temple access to marginalized communities.
- ● Social Reforms: Founded SNDP Yogam to fight untouchability and caste discrimination.
- ● Literary Works: Authored texts like *Atmopadesa Satakam* and *Daiva Dasakam*.

Chola Administration & Art

- ● Governance: Hierarchical divisions (mandalams, valanadus, nadus).
- ● Art & Architecture: Brihadeshwara Temple, Gangaikonda Cholapuram, bronze sculptures (e.g., Nataraja).

Ratnagiri Buddhist Excavation

- ● Location: Odisha's Diamond Triangle (alongside Udayagiri, Lalitgiri).
- ● Findings: Buddha relics, monastic complexes, 8th–9th-century artefacts.

Entity Locker

A cloud-based platform for secure storage, sharing, and verification of business documents in India.

Vikas Engine

A key liquid-fuel engine developed by ISRO, with a nominal thrust of 80 tonnes.

- ● Usage: Powers PSLV, GSLV, and LVM3 launch vehicles.

- Future Role: Throttling capability to support booster recovery in advanced launch systems.

Pralay Missile:
- A short-range, surface-to-surface quasi-ballistic missile developed indigenously by DRDO, derived from the Prithvi Defence Vehicle.
- Designed for deployment along the Line of Actual Control (LAC) and Line of Control (LoC).
- Equipped with a solid-propellant rocket motor, it has a range of 150-500 km and can be launched from a mobile platform.
- It carries conventional warheads with a payload capacity of 500-1,000 kg.
- Features guidance systems ensuring high precision (CEP <10 meters) and can alter its trajectory mid-air.
- Capable of reaching terminal speeds of Mach 6.1, targeting strategic installations like radars, command centres, and airstrips.

Vaigai River:
- A 258 km-long river in Tamil Nadu, originating from the Varusanadu and Megamalai hills of the Western Ghats.
- Flows southeast through the Pandya Nadu region before emptying into the Palk Strait near the Pamban Bridge.
- Covers a drainage area of 7,741 sq. km, entirely within Tamil Nadu.
- Major tributaries: Suruliyaru, Mullaiyaru, Varaganadhi, Manjalaru, Kottagudi, Kridhumaal, and Upparu.
- Receives significant inflow from the Periyar Dam in Kerala through a tunnel under the Western Ghats.
- Mentioned in Sangam literature dating back to 300 BCE.

Asan Conservation Reserve (ACR):
- A 444-hectare protected area along the Asan River in Dehradun, Uttarakhand, meeting the Yamuna River.
- Declared a conservation reserve in 2005 under the Wildlife (Protection) Act, 1972.
- First Ramsar site in Uttarakhand and designated an Important Bird Area by BNHS and BirdLife International.

- Hosts over 330 bird species, including critically endangered and vulnerable species.
- Part of the Central Asian Flyway, attracting migratory and resident birds.
- Supports diverse aquatic life, including the endangered Putitor Mahseer.

Mount McKinley (Denali):
- Renamed as Denali by a US presidential order, it is the highest peak in North America.
- Features permanent snowfields feeding major glaciers like Kahiltna, Muldrow, Peters, Ruth, and Traleika.
- Forms the centrepiece of Denali National Park and Preserve.

Scramjet Engine:
- An advanced version of the Ramjet, functioning at hypersonic speeds (>Mach 5).
- Designed for next-gen hypersonic missiles, rapid civilian air travel, and cost-effective satellite launches.
- Developed by DRDO's Defence Research & Development Laboratory (DRDL) in Hyderabad.
- Hypersonic weapons using scramjet technology can evade current air defence systems.

Prime Minister's Internship Scheme:
- Announced in Budget 2024-25, offering internship opportunities to one crore youth in the top 500 companies over five years.
- Aims to provide hands-on exposure to business environments and employment opportunities.
- Partner companies are to begin offering internships from October 2024, with eligibility based on CSR expenditure.
- Open to individuals aged 21-24, with a 12-month internship duration, including real-world job training.

Diamond Imprest Authorization (DIA) Scheme:
- Launched by the Department of Commerce to boost India's diamond industry.
- Allows duty-free import of natural cut and polished diamonds below 0.25 carats.
- Requires a minimum value addition of 10% before export.

● Eligibility is restricted to Two Star Export House status holders with annual exports exceeding $15 million.

Pinaka Rocket System:
● Indian Army placed a Rs 10,200 crore order for Pinaka multi-launch rocket system ammunition.
● Developed by DRDO, it is named after Lord Shiva's mythical weapon.
● Capable of striking targets beyond 75 km, launching 12 rockets in 44 seconds.
● Armenia became its first international customer, with other countries expressing interest.

Jawaharlal Nehru Port (JNPA):
● Located in Mumbai, Maharashtra, and India's leading container-handling port.
● Commissioned in 1989 as India's first 100% landlord major port.
● Handles 50% of India's total containerized cargo, ranking 26th among the world's top 100 container ports.
● Connected to over 200 global ports, aiming to handle 10 million TEUs by 2027.

Chandra X-Ray Observatory:
● One of NASA's premier space telescopes was launched in 1999 aboard Space Shuttle Columbia (STS-93).
● Detects X-ray emissions from hot cosmic phenomena like black holes, galaxy clusters, and supernovae.
● Part of NASA's "Great Observatories" alongside Hubble, Spitzer, and the deorbited Compton Gamma Ray Observatory.
● Operates from an altitude of 139,000 km, with eight times greater resolution than previous X-ray telescopes.

Sukanya Samriddhi Yojana (SSY):
● A savings scheme launched under the Beti Bachao, Beti Padhao campaign in 2015.
● Open to Indian girls under 10 years, with a maximum of two accounts per family.
● Minimum deposit: Rs. 250; maximum: Rs. 1.5 lakh annually.
● Tenure: 21 years, with contributions required for only the first 15 years.
● Offers tax benefits under Section 80C of the Income Tax Act.

- Allows partial withdrawal for education and full withdrawal for marriage after 18 years.

Mannan Community:
- A Scheduled Tribe (ST) in Kerala, known for its unique matrilineal kingship.
- The Raja Mannan is elected by community elders and plays a key role in cultural functions.
- Primarily settled in the buffer zone of Idukki Wildlife Sanctuary, with 48 settlements.
- Engage in agriculture, cattle breeding, and forest produce collection for sustenance.
- Famous for their traditional art form, Mannankoothu, narrates stories from Tamil classics like Silapathikaram.

Mount Ibu:
- An active stratovolcano on Halmahera Island, Indonesia.
- Stands at 1,325 meters with a truncated summit and large nested craters.
- Frequently erupts with lava flows, ash plumes, and pyroclastic activity.

National Voters' Day (NVD):
- Celebrated annually on January 25 since 2011, marking the establishment of the Election Commission of India.
- Promotes voter awareness and enrollment, with the theme "Nothing Like Voting, I Vote for Sure."

Forever Chemicals (PFAS):
- Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) are hazardous, non-degradable chemicals found in various products.
- Present in cosmetics, cookware, aircraft, and industrial applications.
- Linked to health risks such as infertility, hormonal disruptions, high cholesterol, and certain cancers.
- Listed under the Stockholm Convention due to environmental concerns.

Enemy Property:
- Refers to assets owned by nationals of hostile nations during conflicts.
- Primarily associated with Indo-Pak and Indo-China wars.

- Governed by the Enemy Property Act, of 1968, which vests control with the Custodian of Enemy Property.

Crosspathy:
- The practice of prescribing homoeopathic or ayurvedic treatments alongside allopathic medicine.
- A recent directive allows chemists to accept allopathic prescriptions from qualified homoeopaths.

Stargate Initiative:
- A $500 billion US project to build AI infrastructure over four years, backed by OpenAI, SoftBank, and Oracle.
- Involves constructing large-scale data centres to enhance US technological capabilities.

Rakhigarhi

A recently discovered reservoir in Haryana's Rakhigarhi highlights the advanced engineering skills of the Harappan civilization and contributes to ongoing research on the Saraswati River. Located in the Ghaggar-Hakra river plain, Rakhigarhi is the largest Indus Valley site and the only one to yield DNA evidence from the Harappan era.

Shompens

Among India's Particularly Vulnerable Tribal Groups (PVTGs), the Shompens inhabit the dense tropical rainforests of the Great Nicobar Islands in the Andaman & Nicobar region. Unlike other primitive tribes of the area, they belong to the Mongoloid stock rather than the Negrito group. They primarily live in isolation, forming nuclear families. The Shompens worship the moon goddess, Houou, whom they believe created the universe.

Deep Ocean Mission

A Central Sector scheme under the Ministry of Earth Sciences (MoES), the Deep Ocean Mission supports India's Blue Economy initiatives. One of its key projects, *Samudrayaan*, focuses on developing a manned submersible (*Matsya 6000*) to carry three people to a depth of 6000 meters for ocean exploration.

Blue Carbon

Research indicates that mangroves and coastal wetlands sequester carbon at a rate ten times higher than mature tropical forests. *Blue Carbon* refers to carbon captured by marine and coastal ecosystems such as mangroves, tidal marshes, and seagrass meadows, which store more carbon per unit area than terrestrial forests.

Pangsau Pass

The Pangsau Pass International Festival was recently held in Nampong, Arunachal Pradesh. Known as the "Hell Gate" due to its rugged terrain in the Patkai Mountain Range, this pass serves as an accessible route from the Assam plains into Myanmar. The *Lake of No Return*, located on the Myanmar side, is visible from this pass.

Udanti Sitanadi Tiger Reserve

Formed by merging Udanti and Sitanadi Wildlife Sanctuaries, this reserve is located in Chhattisgarh's Gariaband district. Named after the rivers Udanti and Sitanadi, the reserve forms a crucial forest corridor connecting Kanker and North Kondagaon forests with the Indravati Tiger Reserve in Bastar.

White-Naped Tit

Recently documented in North Karnataka's Kappatagudda hills, the White-Naped Tit (*Machlolophus nuchalis*) is a passerine bird from the Paridae family. Endemic to India, it is found in two separate regions—northwest (Gujarat, Haryana, Rajasthan) and southern India (Andhra Pradesh, Karnataka, Tamil Nadu). It inhabits dry thorn scrub forests and is the only black-and-white tit species in India.

- ⬤ IUCN Status: Vulnerable

Advanced Towed Artillery Gun System (ATAGS)

Developed indigenously by DRDO in collaboration with Bharat Forge and Tata Advanced Systems, ATAGS is a large-calibre artillery system capable of firing Long-Range Guided Munitions (LRGM) for precision strikes. It features *shoot-and-scoot* capability and is designed to function in extreme temperatures.

Paraquat

Also known as *paraquat dichloride* or *methyl viologen*, this widely used herbicide is primarily employed for weed control and crop desiccation (e.g., cotton). The WHO

classifies it as a *Category 2* (moderately hazardous) chemical. Despite being banned in over 70 countries, including China and the EU, it remains in use in India and the US due to its effectiveness.

Inland Waterways Authority of India (IWAI) Established under the *Inland Waterways Authority of India Act, 1985*, IWAI oversees the development and maintenance of national waterways. It operates under the Ministry of Ports, Shipping, and Waterways, with headquarters in Noida, Uttar Pradesh.

Etikoppaka Dolls
Originating from Andhra Pradesh's Etikoppaka village, these handcrafted wooden toys are made from *Ankudu Karra* (Ivory Wood). Carved, shaped, and painted with natural dyes from plants and seeds, these eco-friendly toys include depictions of animals, birds, and decorative items.

Whip in Parliament
A *whip* is an order issued by political parties to their members in Parliament, directing them to follow the party's stance on voting. MPs must comply, or they risk disqualification.
- Types of Whips:
  - One-line whip: Informs members about a vote, but attendance is optional.
  - Two-line whip: Requires attendance but does not mandate voting direction.
  - Three-line whip: Mandates both presence and voting per party directive. Although not mentioned in the Constitution, whips are part of parliamentary conventions. The *Chief Whip* issues these directives, assisted by additional whips.

Reserve Bank – Integrated Ombudsman Scheme, 2021
This scheme consolidated three earlier RBI Ombudsman frameworks into a unified system:
1. *Banking Ombudsman Scheme (2006)*
2. *Ombudsman Scheme for Non-Banking Financial Companies (2018)*
3. *Ombudsman Scheme for Digital Transactions (2019)*
   It addresses customer complaints related to service deficiencies in banks, NBFCs,

payment systems, and credit information companies. The scheme also includes non-scheduled primary cooperative banks with deposits exceeding ₹50 crore.

Chhatrapati Sambhaji Maharaj

Chhatrapati Sambhaji Maharaj was the eldest son of Chhatrapati Shivaji Maharaj. He ascended the throne in 1681 after a fierce succession struggle with his half-brother Rajaram. His reign coincided with Mughal emperor Aurangzeb's expansionist campaigns in the Deccan, leading to frequent conflicts between the Marathas and the Mughals.

Victoria Lake

Victoria Lake, the world's largest tropical lake, is also Africa's largest and the second-largest freshwater lake globally after North America's Lake Superior. Named in honour of Queen Victoria, it spans across Tanzania, Uganda, and Kenya in East Africa.

Unified Pension Scheme (UPS)

A committee led by former Finance Secretary T.V. Somanathan proposed the Unified Pension Scheme (UPS) as an alternative to the National Pension System (NPS). The Pension Fund Regulatory and Development Authority (PFRDA) will regulate the framework, ensuring a guaranteed pension of 50% of an employee's average basic salary from the last 12 months of service, provided they have completed a minimum of 25 years in government service. The scheme also includes family pension provisions, gratuity benefits, and a minimum pension of ₹10,000 per month for government employees with at least 10 years of service.

Piezoelectricity

Piezoelectricity refers to the ability of certain materials to generate an electric charge in response to mechanical stress and vice versa. This effect occurs in materials with a net electric dipole moment, where mechanical strain alters polarization, leading to charge accumulation.

Baltic Sea

The Baltic Sea, located in Northern Europe, is one of the Atlantic Ocean's seas and the youngest sea on Earth. It has an 8,000 km coastline shared by Sweden, Poland, Lithuania, Latvia, Finland, Estonia, Germany, Denmark, and Russia. Notably, it is the world's largest brackish inland water body.

Nagoba Jatara

Nagoba Jatara is an eight-day tribal pilgrimage festival of the Mesram clan of the Adivasi Gonds, held in Keslapur village, Indervelli Mandal, Telangana. It is the second-largest tribal festival in India after the Sammakka Saralamma Jatara. The festival is dedicated to the deity 'Nagoba' (Cobra) and features the Gusadi Dance performed by the Gond tribe.

WASP-127b

Scientists have recently detected supersonic winds travelling at 33,000 km/h on WASP-127b, a gas giant exoplanet in the Milky Way. This planet, 30% larger than Jupiter but only 16% of its mass, is among the puffiest planets observed.

Etikoppaka Toys

Andhra Pradesh's Etikoppaka Toys, known for their smooth designs and vibrant colours made with natural dyes, was recently showcased at the Republic Day parade. These eco-friendly wooden toys, which received the Geographical Indication (GI) tag in 2017, are culturally significant.

Fentanyl

Fentanyl is a potent synthetic opioid used as an analgesic and anaesthetic. It is 100 times stronger than morphine and 50 times stronger than heroin. Overdosing on fentanyl can lead to respiratory failure, coma, and death.

Indian Squid The Central Marine Fisheries Research Institute (CMFRI) in Kochi has decoded the gene expression pattern of the Indian squid (Uroteuthis duvaucelii), also known as the Indian calamari. Found in the Indo-Pacific, these cephalopods exhibit advanced neural functions and remarkable behaviours like camouflage and jet propulsion. The species is listed as 'Least Concern' by the IUCN.

Organophosphates

Organophosphates are chemical compounds widely used in pesticides and insecticides. They are derived from the esterification of phosphoric acid and alcohol and play a key role in crop protection, pest control, and plastic manufacturing.

Lezim Dance

Lezim is a traditional folk dance of Maharashtra, named after a wooden instrument with cymbals. Accompanied by dhol or dhalgi, it is primarily performed during the Ganesh festival procession.

'When-Listed' Platform

The Securities and Exchange Board of India (SEBI) plans to introduce a 'when-listed' trading platform to regulate the trading of IPO shares before their official listing, reducing unregulated grey market activities.

Harmful Algal Blooms (HABs)

HABs occur due to excessive nutrients, warm water temperatures, and pollution, leading to toxin production and oxygen depletion in aquatic ecosystems. Cyanobacteria, dinoflagellates, and diatoms are the primary culprits.

Bomb Cyclone

A bomb cyclone, or bombogenesis, is a rapidly intensifying mid-latitude storm caused by the collision of warm and cold air masses, resulting in hurricane-force winds and heavy precipitation.

Fingerprint Use in Law Enforcement

Fingerprint analysis is key to identifying criminals. The Criminal Procedure (Identification) Act, of 2022, allows storing of fingerprints for serious offenses. The Henry Classification System is used for fingerprint matching, with a 10-point match being considered conclusive evidence.

DeepSeek

DeepSeek, an AI chatbot developed by a Chinese company, competes with leading AI models like OpenAI's GPT. It excels in speed and contextual understanding, particularly in regional idioms and cultural nuances.

Large Language Model (LLM)

LLMs are AI-driven systems capable of processing and generating human language. They are employed in text generation, language translation, and summarization.

F11 Bacteria

F11 bacteria assist in bioaugmentation for wastewater treatment and contaminated soil cleanup. It helps degrade persistent pollutants, including PFAS compounds.

Silicon Carbide

Silicon carbide (SiC) is a synthetic compound known for its hardness, thermal stability, and chemical resistance, making it valuable in various industries.

Upanishads

The Upanishads, forming the concluding part of the Vedas, explore philosophical and spiritual wisdom. They are also called Vedanta, meaning the 'end of the Vedas.'

Martyrs' Day

January 30, observed as Martyrs' Day, commemorates Mahatma Gandhi's assassination in 1948. Also known as Shaheed Diwas, it honours those who sacrificed their lives for India's independence.

Domicile-Based Reservations

Article 16(2) prohibits discrimination based on residence, but Article 16(3) allows Parliament to prescribe residence-based conditions for government employment.

Inherited Retinal Diseases (IRDs)

IRDs, also called retinal dystrophies, result from genetic mutations affecting photoreceptors. Over 300 genes contribute to retinal function.

Guantánamo Bay

Located in southeastern Cuba, Guantánamo Bay is a strategically significant naval base known for detaining terrorism suspects since 2001.

Household Consumption Expenditure Survey

Conducted by MoSPI, this survey measures poverty, inequality, and social exclusion based on Monthly Per Capita Consumption Expenditure (MPCE).

Enforcement Case Information Report (ECIR)

ECIR is a formal complaint recorded by the Enforcement Directorate (ED) but is not legally equivalent to an FIR.

Point Nemo
Point Nemo, or the Oceanic Pole of Inaccessibility, is the most remote location from any landmass on Earth. Recently, two Indian Navy officers crossed it aboard INSV Tarini.

Graphics Processing Unit (GPU)
GPUs are specialized processors designed for parallel tasks like 3D rendering and AI computation, differing from general-purpose CPUs in structure and function.