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MAGAZINE

FEBRUARY 2025

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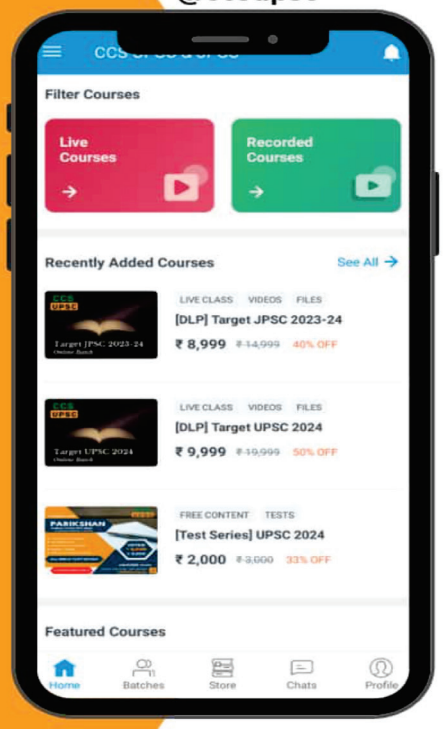

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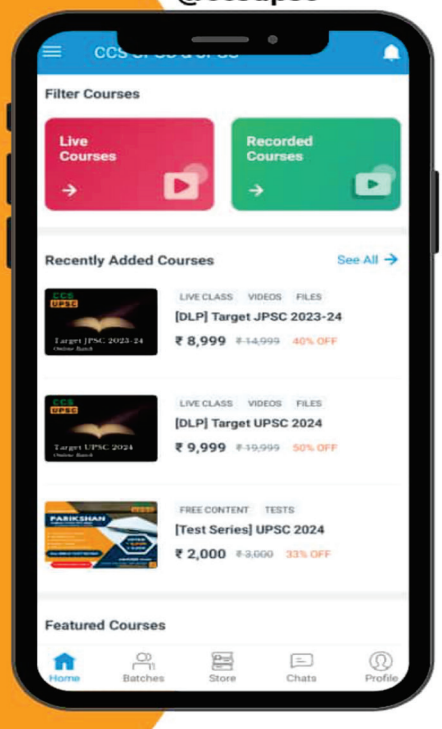

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February-2025

Current Affairs

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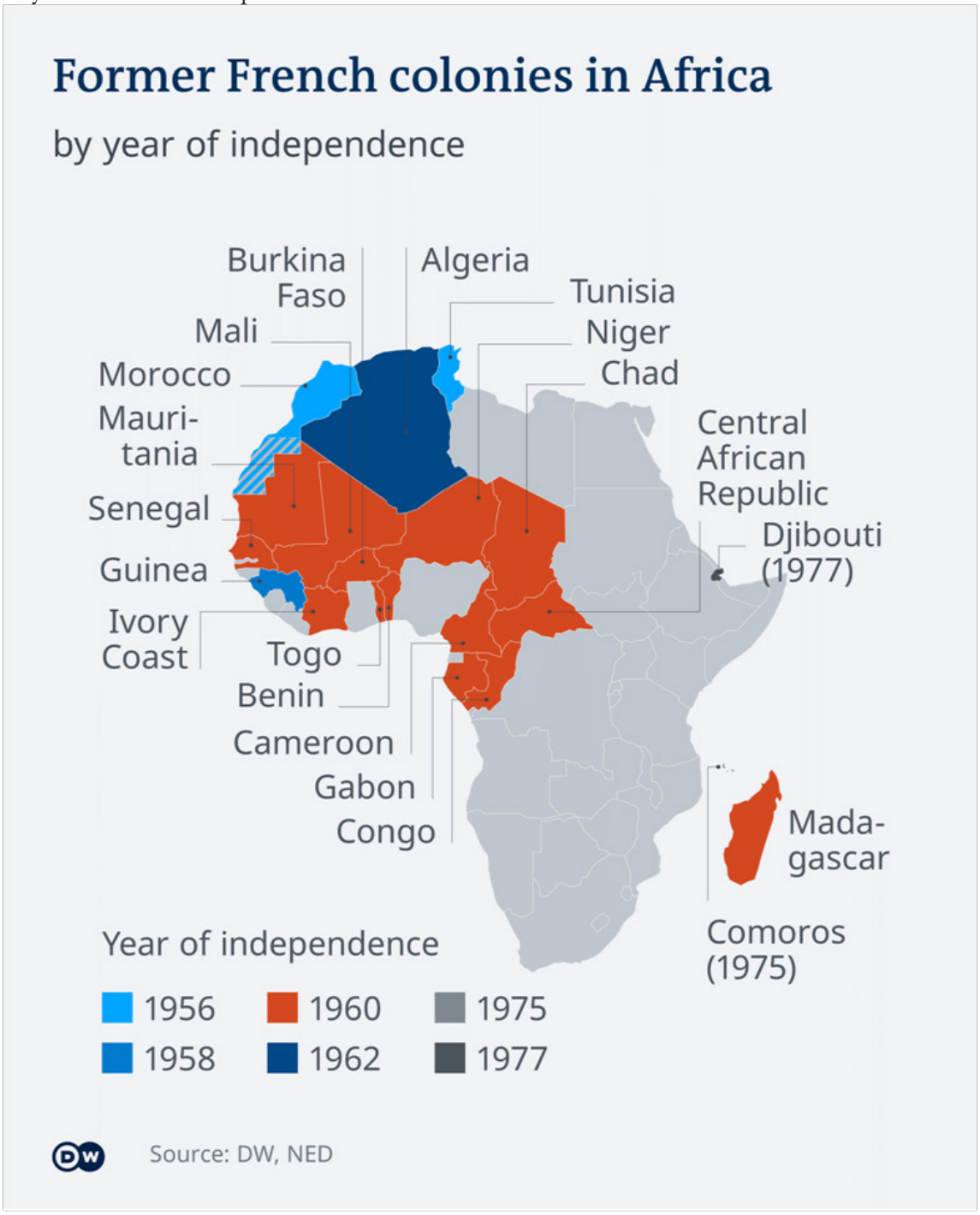
HISTORY & CULTURE

France colonization Africa

Context:

West African countries are moving away from traditional colonial ties with France, seeking partnerships with global powers for security and economic cooperation.



About France's Colonization of Africa

How France Colonized Africa?

1. Early Ventures (1830): France began its colonization with the capture of Algiers in 1830, marking the expansion of French influence in North Africa.
2. Expansion in West Africa: Territories such as Gambia, Ivory Coast, and Senegal were brought under French control.
3. Berlin Conference (1884-85): France formalized its territorial claims, acquiring vast regions in North, West, and Central Africa.
4. Direct Rule: France imposed a centralized administrative system modelled on European governance, weakening traditional power structures in African colonies.
5. Economic Exploitation: Extensive use of forced labour and resource extraction, especially in gold, cocoa, groundnuts, and timber, ensured that colonies served as economic hubs for France.

Consequences of French Colonization:

1. Economic:

- Resource Extraction: African resources were exported to France, leaving minimal local development.
- Monoculture Economies: Colonies were forced to rely on single crops like groundnuts (Senegal) and cocoa (Ghana).
- Taxation: Harsh fiscal policies drained local economies, exacerbating poverty.

2. Social and Cultural

- Racial Discrimination: Africans were treated as second-class citizens under French rule.
- Erosion of Traditional Systems: Indigenous governance structures were replaced by European models, disrupting local societies.
- Cultural Looting: Thousands of African artifacts were smuggled to France, leaving African nations bereft of their heritage.

3. Political

- Artificial Borders: Arbitrary boundaries drawn by colonial powers created ethnic divisions, fuelling post-independence conflicts.
- Exploitation of Labor: Forced labour systems led to mass displacements and population decline in many regions.

Decolonization of Africa:

- Post-WWII Pressures: Global anti-colonial movements and African resistance catalysed decolonization.
- Independence Movements: Countries like Senegal, Algeria, and Guinea gained independence through negotiation or conflict.
- Continued Influence: Despite granting independence, France maintained strong economic and political ties through the Françafrique system, ensuring African nations remained reliant on France.

Present Role of France in Africa:

1. Military:

- Troop Presence: French troops were stationed in Chad, Senegal, and Ivory Coast, aiming to combat insurgencies.
- Recent Withdrawals: Anti-French sentiments and failures in addressing regional terrorism led to troop withdrawals from several nations.

2. Economic:

- Economic Dependence: Many African countries still trade heavily with France. However, competition from China's Belt and Road Initiative and Russia's military alliances is reducing French dominance.

3. Declining Influence:

- Shift in Alliances: African nations are partnering with global powers like Russia and China, moving away from colonial ties.
- Françafrique in Crisis: The model of dependency is being rejected as nations demand sovereignty and equitable partnerships.

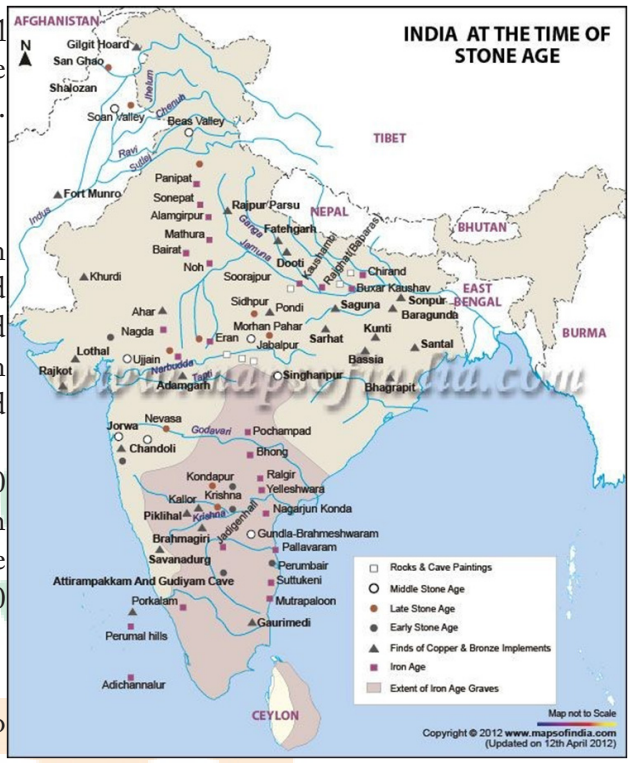
Conclusion:

France's colonial history left deep scars on Africa, shaping its political and economic systems. While the decolonization movement ended formal colonialism, France's waning influence highlights Africa's push for sovereignty and diversification of partnerships. The shift reflects a changing global order, with new players stepping into Africa's geopolitical landscape.

Iron Age

Context:

Recent dating of burial urn samples from Sivagalai in Tamil Nadu's Tuticorin district suggests that the Iron Age may have begun there at least 1,000 years earlier than previously estimated.



About Iron Age:

- **What is the Iron Age?**
  - The Iron Age refers to the period in history when iron became the dominant material for tools and weapons, replacing earlier materials like stone and bronze. It is marked by significant advancements in metallurgy and technology, leading to societal and economic transformations.
- Timeframe: Globally, the Iron Age began around 1200 BCE. However, recent findings in Tamil Nadu push India's Iron Age back to 3,345 BCE, predating the globally recognized Hittite Empire's use of iron (1380 BCE).
- **Key Locations in India:**
  - Sivagalai (Tamil Nadu): Earliest evidence, dated to 3,345 BCE.
  - Mayiladumparai (Tamil Nadu): Evidence from 2,172 BCE.
  - Brahmagiri (Karnataka): Iron Age evidence from 2,140 BCE.
  - Gachibowli (Telangana): Dated to 2,200 BCE.
- **Phases of the Iron Age in India:**
  - Early Iron Age (1500 BCE – 1000 BCE)
  - Introduction of iron tools in agriculture and hunting (e.g., Hallur, Karnataka).
  - Overlaps with the late Vedic period; texts like the Atharvaveda composed.
  - Significant sites: Atranjikhera (Uttar Pradesh) and Malhar (Chhattisgarh).

Middle Iron Age (1000 BCE – 600 BCE)

- Expansion of iron technology and urbanization.
- Painted Grey Ware (PGW) culture emerges in the Ganga-Yamuna plains.
- Rise of fortified settlements like Kausambi and early states (Janapadas).

Late Iron Age (600 BCE – 200 BCE)

- Formation of Mahajanapadas and rise of the Mauryan Empire.
- Spread of Buddhism and Jainism; Ashoka's edicts promote ethical governance.
- Significant urban centres: Pataliputra (Patna) and Ujjain.
- **Key Features of the Iron Age:**
  - Iron Technology: Advanced smelting techniques led to the production of durable tools and weapons.
  - Agricultural Revolution: Iron ploughs and sickles boosted productivity, enabling surplus food production.
  - Urbanization: Fortified cities with sophisticated infrastructure, including drainage systems and public buildings.
  - Political Structures: Emergence of Janapadas and Mahajanapadas, followed by the Mauryan Empire's rise.

- Cultural Growth: Composition of texts like the Upanishads and emergence of Buddhist and Jain art and philosophy.

Konark Sun Temple

Context:

Recently, Singapore President Tharman Shanmugaratnam visited the Sun Temple, highlighting its global prominence and Odisha's rich craftsmanship.

About Konark Sun Temple:

- Location: Situated in Konark, Odisha, near the Bay of Bengal.
- Built in: Constructed in the 13th century (1238–1264 CE).
- Built by: Commissioned by King Narasimha Deva I of the Ganga dynasty.
- Kingdom associated: Represents the strength and stability of the Ganga Empire.

Architectural features:

- Chariot Design: The temple is designed as a grand chariot of Surya, the Sun God, with 24 elaborately carved wheels, each 3 meters in diameter, symbolizing time and celestial movement.
- Seven Horses: The temple features seven sculpted horses pulling the chariot, representing the Sun's journey across the sky.
- Intricate Sculptures: The plinth and walls are adorned with detailed carvings of dancers, musicians, animals, and mythological narratives, showcasing the artistic finesse of the era.
- Vimana and Shikhara: The original principal sanctuary (vimana) was topped with a towering shikhara (crown), which collapsed in the 19th century.
- Natmandir and Jahamogana: The dance hall (natmandir) and audience hall (jahamogana) exhibit pyramidal designs, reflecting the grandeur of Kalinga temple architecture.
- Symbolic Motifs: Depictions of lions, mythical creatures, and erotic sculptures highlight the spiritual, cultural, and symbolic aspects of 13th-century life.
- Global Recognition: Listed as a UNESCO World Heritage Site, acknowledged for its artistic ingenuity and cultural relevance, attracting tourists worldwide.

Kalaripayattu

Context:

The 38th National Games in Uttarakhand has sparked controversy over the relegation of Kalaripayattu, Kerala's ancient martial art form, to the demonstration section.

About Kalaripayattu:

- What it is: Kalaripayattu is one of the oldest martial arts in the world, combining combat techniques, physical training, and healing practices.
- State of origin: Originated in Kerala, it holds deep cultural and historical roots in South India.

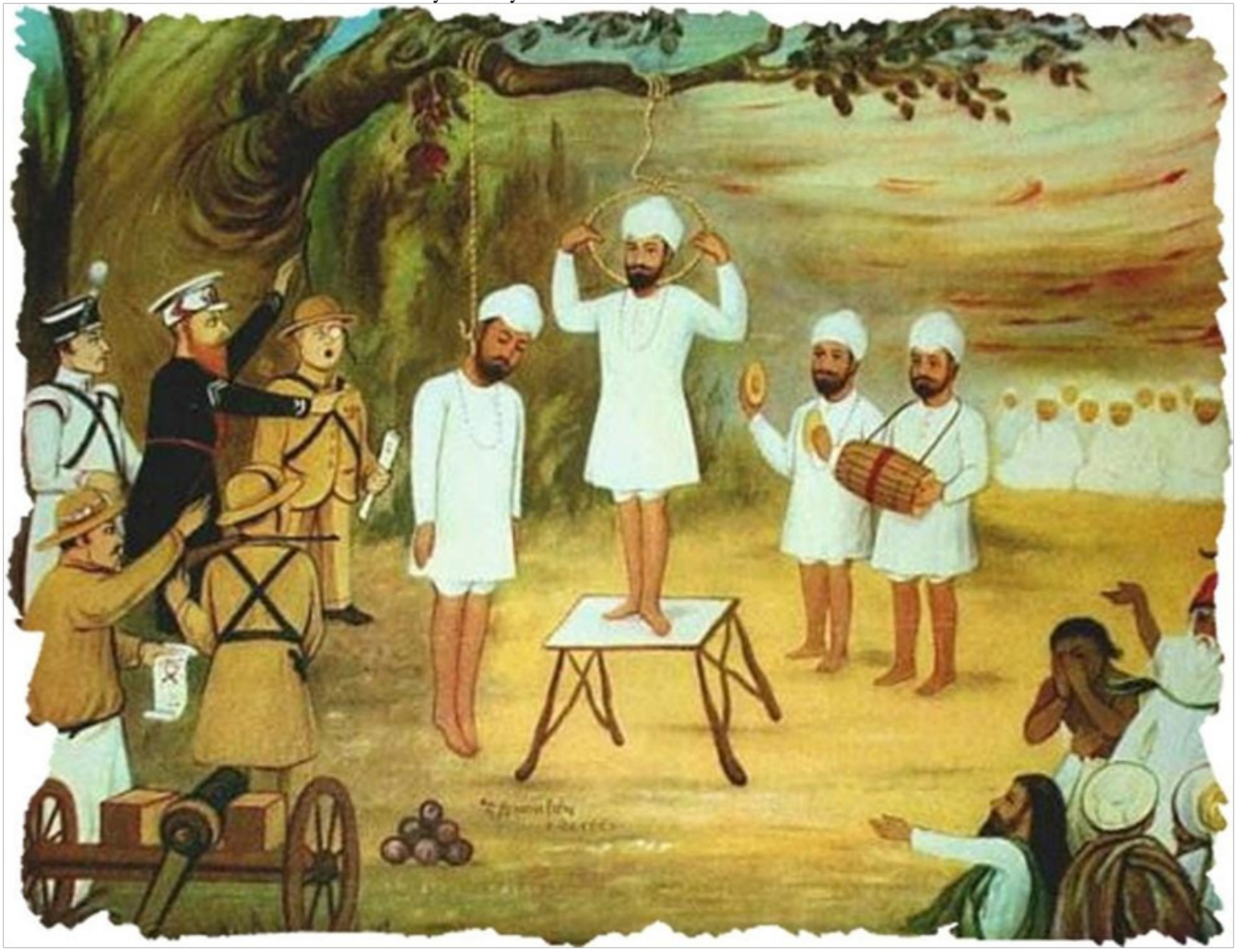
History and features:

- History: Mythology credits the warrior sage Parasurama with its creation. The term "Kalari" means "combat arena," and "Payattu" means "fight" in Malayalam.
- Key Features: The martial art emphasizes body conditioning (Maippayattu), wooden weapons (Kolthari), metallic weapons (Angathari), and bare-handed techniques (Verumkai). It enhances strength, flexibility, reflexes, and discipline.
- Recognition: It was added to the National List of Intangible Cultural Heritage (ICH) of India in 2009.
- Women's Participation: Historically, women have trained in Kalaripayattu, and they continue to excel in its practice today.

Kuka Rebellion

Context:

On January 17, the Punjab Chief Minister paid tribute at a function held at the Namdhari Shaheed Smarak in Malerkotla to commemorate Kuka Martyrs' Day.



About Kuka Rebellion:

What it is:

- The Kuka Rebellion was an anti-British uprising led by the Namdhari sect, also known as Kukas, in Punjab. The movement combined religious reform and resistance to colonial authority.
- Occurred in: The rebellion reached its peak in January 1872, with significant clashes in Malerkotla and Malaudh Fort.
- Leaders: The rebellion was spearheaded by Satguru Ram Singh, founder of the Namdhari sect, along with leaders like Kuka Hira Singh and Lehna Singh.

Reason behind the movement:

- Religious Reform: Opposition to social vices like meat consumption, alcohol, and foreign goods.

- Colonial Oppression: Discontent with British rule and native collaborators loyal to the colonizers.
- Cow Slaughter: Protests against cow slaughter, which deeply offended the sentiments of the Kukas.

Events during the movement:

- Attack on Malerkotla (January 13, 1872): Kukas clashed with officials following a cow slaughter incident.
- Assault on Malaudh Fort (January 15, 1872): A Kuka contingent attacked the fort under a pro-British ruler but faced strong resistance.
- Mass Executions: After their surrender, 49 Kukas were executed on January 17 and 17 more on January 18 by being blown up with cannons.
- Suppression: The British, led by John Lambert Cowan, acted with extreme brutality. Thousands of people were forced to witness these executions to serve as a deterrent.

Changes after the revolt:

- Exile of Leaders: Satguru Ram Singh and key leaders were exiled to Rangoon, Burma, marking the suppression of the movement.
- Legacy of Martyrdom: Stories of bravery, such as the sacrifice of 12-year-old Bishan Singh and Waryam Singh, inspired future resistance movements.

Republic Day Craft Products

Context:

To mark 75 years of the Republic of India, President has introduced a unique Republic Day "At Home" reception. Invitees will receive a curated box of crafts showcasing southern India's rich heritage.

- These crafts, created by artisans from five southern states under the "One District One Product" scheme.

About Craft Products in the News:

1. Kalamkari Painted Bamboo Box (Andhra Pradesh):

- Features: Handcrafted with traditional Nimmalakunta Kalamkari paintings.
- GI Tag State: Andhra Pradesh.

2. Ikat-Pochampalli Cover (Telangana):

- Features: Reusable cover showcasing Ikat weaving tradition.
- GI Tag State: Telangana.

3. Ganjifa Art Magnet (Karnataka):

- Features: Depicts the intricate Ganjifa art, known for its connection to playing cards.
- GI Tag State: Karnataka.

4. Kanjeevaram Silk Pouch (Tamil Nadu):

- Features: Handmade silk pouch symbolizing the elegance of Kanjeevaram weaving.
- GI Tag State: Tamil Nadu.

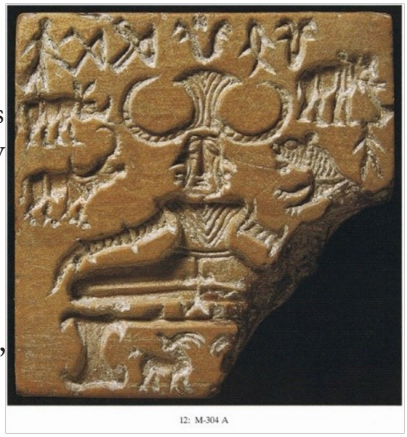
5. Etikopakka Dolls (Andhra Pradesh):

- Features: Eco-friendly, traditional wooden dolls.
- GI Tag State: Andhra Pradesh.

6. Screwpine Leaf Bookmark (Kerala):

- Features: Woven from natural screwpine leaves, symbolizing sustainability.
- GI Tag State: Kerala.

Indus Valley Script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Context:

Tamil Nadu Chief Minister offer of a $1 million prize for anyone who deciphers the Indus Valley script serves a purpose beyond solving the lingering mystery regarding the 5,000-year-old civilization.

About Harappan Script:

What it is:

- The writing system of the Indus Valley Civilization (c. 2600-1900 BCE), featuring undeciphered symbols with no confirmed linguistic association.

Material used:

- Found on steatite seals, clay impressions, pottery, bronze tools, stoneware bangles, shells, ivory, and small copper tablets.
- Seals were often square, about 2.54 cm, and occasionally made of materials like silver, faience, and calcite.

Features of the script:

- Short inscriptions averaging five symbols, with the longest known being 26 symbols.
- Early forms appeared during the Ravi and Kot Diji phases (c. 3500-2700 BCE).
- The script appears to have fully developed by the Urban period (c. 2600-1900 BCE).

Motifs found on script:

- Animal motifs such as unicorns, bulls, tigers, elephants, and mythical creatures.
- Depictions of human figures, often in symbolic or narrative contexts, including combat or ritual scenes.

National Anthem

Context:

The controversy arose in Tamil Nadu's Legislative Assembly when Governor left without delivering the customary address, citing the absence of the National Anthem.

About National Anthem:

- Written by: Composed by Rabindranath Tagore in Bangla.
- Adopted in: The Hindi version was adopted as the National Anthem of India by the Constituent Assembly on January 24, 1950.
- Procedure for Singing the Anthem:

Full Version:

- Time: Approximately 52 seconds.

Conditions & Occasions:

- During civil and military investitures.
- When the President or Governor arrives at or departs from formal state functions.
- At parades or when the National Flag is unfurled.
- On arrival or departure of the President for any public function.
- Preceded by a drum roll when played by a band.

Short Version:

- **Short Version of Anthem:**
  - Jana-gana-mana-adhinayaka jaya he,
  - Bharata-bhagya-vidhata,
  - Jaya he, jaya he, jaya he, Jaya jaya jaya jaya he.
- Time: Approximately 20 seconds.
- Conditions & Occasions:
- Played during toasts in Messes.
- On occasions with special orders by the Government of India.

Mass Singing:

- **Conditions & Occasions:**
  - During the unfurling of the National Flag.
  - At cultural or ceremonial functions, with choirs or public participation.
  - On arrival or departure of the President at non-state public functions.
  - Schools: Encouraged as part of morning assemblies to instill respect for the natio

Waqf (Amendment) Bill, 2024

Context:

The Joint Committee on the Waqf (Amendment) Bill, 2024 adopted its report by a majority vote, clearing the way for the government to move the Bill during the upcoming Budget Session of Parliament.

What is a Waqf Board?

- Established in: The concept of Waqf Boards was formalized under the Waqf Act, 1954, and further strengthened by the Waqf Act, 1995. (It is statutory body)
- Governed by: The Ministry of Minority Affairs, Government of India, oversees the functioning of Waqf Boards.

Functions and Powers:

- Administration: Manages and supervises Waqf properties.
- Recovery: Recovers lost or encroached Waqf properties.
- Transfer: Sanctions the transfer of immovable Waqf properties through sale, gift, mortgage, exchange, or lease.
- Appointment: Appoints custodians to ensure Waqf revenues are used for designated purposes.
- Legal Authority: Can sue and be sued in court.

Board and Members:

- Chairperson: Appointed by the state government.
- Members: Include Muslim legislators, parliamentarians, members of the state Bar Council, Islamic scholars, and mutawalis (managers) of Waqfs with an annual income of 1 lakh and above.
- Central Waqf Council (CWC): Established in 1964 to oversee and advise state-level Waqf Boards.

Proposed Amendments in the 2024 Bill:

1. **Inclusion of Non-Muslim Members:**
   - Mandates at least two non-Muslim members in the Central Waqf Council and State Waqf Boards.
   - Allows non-Muslim members to form a majority in these bodies.
2. Removal of Waqf by User: Eliminates the concept of Waqf by User, which recognized properties used for religious or charitable purposes over time as Waqf.
3. District Collector's Role: Grants District Collectors the authority to determine ownership of disputed properties and update revenue records.
4. Composition of Tribunals: Removes the requirement for an expert in Muslim law from Waqf Tribunals.
5. Appeals Process: Allows direct appeals to High Courts against Tribunal decisions, removing the finality of Tribunal rulings.

Need for Amendment in 2024:

- Transparency and Efficiency: Aims to improve transparency and efficiency in the management of Waqf properties.
- Inclusivity: Seeks to promote inclusivity by involving non-Muslim members in Waqf governance.
- Dispute Resolution: Enhances dispute resolution mechanisms by granting District Collectors authority over property disputes.
- Legal Clarity: Provides clarity on the creation and management of Waqf properties.
- Modernization: Aligns Waqf governance with contemporary legal and administrative practices.

Issues Surrounding the New Bill:

- Dilution of Muslim Control: Opposition argues that including non-Muslim members dilutes Muslim control over Waqf properties.
- Violation of Article 26: Critics claim the Bill violates Article 26 of the Constitution, which guarantees religious communities the right to manage their own affairs.
- Removal of Waqf by User: Eliminating Waqf by User could lead to disputes over the status of existing Waqf properties.
- Expertise in Muslim Law: Removing the requirement for an expert in Muslim law from Tribunals may affect the adjudication of Waqf-related disputes.
- Potential for Misuse: Granting District Collectors authority over property disputes could lead to misuse and bias.

Way Ahead:

- Stakeholder Consultation: Engage with Muslim community leaders and stakeholders to address concerns.
- Legal Safeguards: Introduce safeguards to prevent misuse of District Collectors' powers.
- Capacity Building: Provide training to District Collectors and Tribunal members on Waqf laws.
- Transparency Measures: Implement measures to ensure transparency in the management of Waqf properties.
- Review and Monitoring: Establish a mechanism for regular review and monitoring of Waqf governance.

Conclusion:

The Waqf (Amendment) Bill, 2024 aims to modernize Waqf governance but faces significant opposition over concerns of dilution of Muslim control and potential misuse of powers. A balanced approach, incorporating stakeholder feedback and legal safeguards, is essential to ensure the effective and fair management of Waqf properties.

PM Surya Ghar Muft Bijli Yojana

Context:

Nearly a year after the 75,000-crore PM Surya Ghar scheme was launched, 8.5 lakh households have installed rooftop solar connections, said Union Minister for New and Renewable Energy.

About PM Surya Ghar Muft Bijli Yojana:

What is the PM Surya Ghar Scheme?

- The PM Surya Ghar Muft Bijli Yojanais a centrally sponsored scheme aimed at providing free electricity to households by subsidizing the installation of rooftop solar panels.
- Ministry: Ministry of New and Renewable Energy (MNRE).
- Launch Date: The scheme was officially launched on February 15, 2024, following its announcement in January 2024.

Aim:

- To provide up to 300 units of free electricity per month to one crore households.
- To reduce electricity costs for households and the government.
- To increase the share of renewable energy in India's energy mix.
- To reduce carbon emissions and promote sustainable development.

Key Features:

- Subsidy: The scheme provides a subsidy of 40% of the cost for solar panel installations. For systems up to 2 kW capacity, the subsidy is 60%, and for systems between 2 kW and 3 kW, it is 40% of the additional cost. The subsidy is capped at 3 kW capacity.
- Financial Outlay: The total outlay for the scheme is 75,021 crore, with 4,950 crore allocated as incentives for DISCOMs (Distribution Companies).
- Target: The scheme aims to cover one crore households by FY 2026-27.
- Savings: Households can save up to 18,000 annually on electricity bills.
- Government Savings: The scheme is expected to save the government 75,000 crore annually in electricity costs.
- DISCOM Incentives: DISCOMs are designated as State Implementation Agencies (SIAs) and receive incentives based on their performance in installing rooftop solar capacity beyond a baseline level.

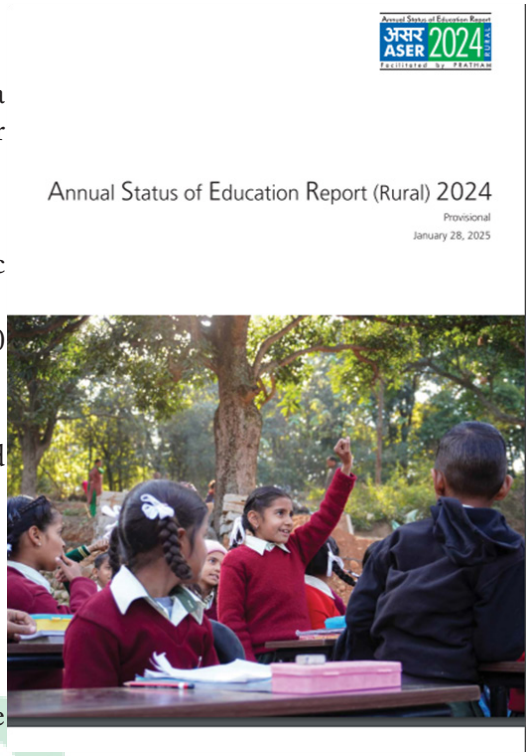
Eligibility Criteria:

- The applicant must be an Indian citizen.
- The household must own a house with a roof suitable for solar panel installation.
- The household must have a valid electricity connection.
- The household must not have availed any other subsidy for solar panels.

ASER Report, 2024

Context:

The Annual Status of Education Report (ASER) 2024 highlights a significant recovery in foundational literacy and numeracy (FLN) after COVID-19-induced learning losses.



What is ASER Report 2024?

- Conducted by Pratham NGO, assessing reading and arithmetic skills of students aged 3 to 16 years.
- Uses 2011 Census data, selecting 30 villages per district and 20 households per village for assessment.
- It covers rural schools specifically.
- Focus on Foundational Literacy and Numeracy (FLN) and tracks learning outcomes in government and private schools.

Three groups – Assessment Categories:

- Pre-primary (3-5 years)
- Elementary (6-14 years)
- Older children (15-16 years).
- First-Time Digital Literacy Evaluation: Assesses smartphone access, usage, and safety awareness among 14-16-year-olds.

Key Data Insights from ASER 2024:

1. Reading Skills Recovery: Class 3 students in government schools reading a Class 2 text improved from 16.3% (2022) to 23.4% (2024).
2. Arithmetic Skills Growth: Class 3 students able to do subtraction increased from 28.1% (2018) to 33.7% (2024).
3. State-Wise Progress: Gujarat, UP, Uttarakhand, Tamil Nadu, Sikkim, Mizoram showed 10%+ improvement in reading skills.
4. Smartphone Access Among Teens: 89% of 14-16-year-olds have access, 57% use it for education, and 76% for social media.
5. Government vs Private Schools: Government schools showed a larger learning gain, closing the gap with private schools.

Positives from ASER 2024:

- Improvement in FLN Skills: Better literacy and numeracy post-COVID due to focused interventions (e.g., NIPUN Bharat Mission).
- Government School Enrolment Stabilization: 66.8% of children enrolled in government schools, close to pre-pandemic levels.
- Stronger Teacher Training: 78% of schools reported receiving FLN training and resources, aiding learning recovery.
- Better Digital Literacy: 87% of students can find videos online, and 92.1% can share them, improving self-learning capacity.
- State-Specific Gains: UP saw a 15% rise in Class 3 reading levels, while Bihar and Odisha improved by 8-10%.

Negatives from ASER 2024:

- High Learning Gaps Persist: 76.6% of Class 3 students still cannot read Class 2 text, highlighting slow foundational recovery.
- Arithmetic Weakness: 66.3% of Class 3 students and 70% of Class 5 students cannot perform simple arithmetic calculations.
- Gender Gap in Digital Safety: Only 55.2% of girls knew how to make their online profile private, lower than boys.

- Variability Across States: Himachal Pradesh and Bihar saw only 4-5% gains, compared to 10%+ in Gujarat and UP.
- Post-Pandemic Drop in Government Enrolment: Enrolment in government schools fell from 72.9% (2022) to 66.8% (2024).

Way Ahead:

- Strengthen Foundational Literacy Programs: Expand NEP 2020 and NIPUN Bharat to bridge learning gaps by 2026-27.
- Improve Teacher Training and Resources: Increase focus on pedagogy-based training to boost student engagement.
- Enhance Digital Literacy and Safety: Introduce school-level training on cybersecurity awareness, especially for girls.
- Focus on State-Specific Interventions: Low-performing states like J&K and Nagaland need customized learning recovery plans.
- Expand Post-Primary Learning Support: Middle school and high school reforms required to sustain early learning gains.

Conclusion:

ASER 2024 highlights substantial recovery in reading and arithmetic post-COVID, but major learning gaps remain. Focused government interventions, improved teacher training, and state-specific policies are essential for sustained educational progress.

Integrating Homeopathy and Allopathy

Context:

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

What is Allopathy?

- Allopathy, or modern medicine, focuses on treating diseases by targeting their symptoms and underlying causes. It uses scientifically validated drugs, surgeries, and advanced technologies for diagnosis and treatment. Allopathic treatments are fast-acting and often used in emergencies.

What is Homeopathy?

- Homeopathy is a form of alternative medicine based on the principle of "like cures like." It uses highly diluted natural substances to stimulate the body's self-healing mechanisms. Homeopathy emphasizes holistic care, considering the physical, emotional, and mental well-being of patients.

Homeopathy differs from Allopathy:

Aspect	Homeopathy	Allopathy
Approach	Treats the root cause by stimulating the body's natural healing process.	Targets symptoms and specific organs using drugs and surgeries.
Medications	Uses highly diluted natural substances.	Relies on synthetic, machine-made pharmaceutical drugs.
Side Effects	Minimal side effects due to dilution.	Side effects can occur due to potent drugs or invasive treatments.
Focus	Holistic approach addressing overall well-being.	Disease-specific approach, focusing on immediate symptom relief.
Speed of Action	Gradual and long-term effect.	Quick and effective, especially in emergencies.

Need for Integration of Homeopathy and Allopathy:

- Improved Healthcare Accessibility: With over 80% shortage of specialist doctors in rural health centres (Health Dynamics of India 2022-23), integrating systems can bridge gaps in care delivery.

  E.g. Homeopathy can complement allopathy in managing chronic illnesses like arthritis and asthma.
- Holistic Care: Homeopathy's focus on immunity and overall well-being can augment allopathy's symptom-based treatment, offering comprehensive care.
- Cost-Effectiveness: Homeopathic treatments are affordable and accessible, making them a viable option for low-income populations.

  E.g. AYUSH health and wellness centres served 8.42 crore patients by 2022, showcasing their popularity.
- Chronic Disease Management: Integrative approaches can be effective in managing non-communicable diseases, where long-term care is crucial.

  E.g. Yoga, an AYUSH component, is widely integrated into modern healthcare for managing diabetes and stress.

Challenges and Limitations:

- Trust Deficit: Lack of evidence-based validation for many homeopathic treatments creates skepticism among allopathic practitioners.
- Regulation Issues: Weak regulatory frameworks make it difficult to ensure accountability in integrative practices.
- Operational Challenges: Training modern doctors in homeopathy and vice versa is time-consuming and may overburden medical curricula.
- Compatibility Concerns: Aligning homeopathy's holistic approach with allopathy's evidence-based methodology requires a significant mindset shift.
- Quality Control: Ensuring the quality and standardization of homeopathic medicines remains a challenge.

Court Judgements:

- Poonam Verma vs. Ashwin Patel & Others (1996): The Supreme Court held the homeopath liable for negligence, ruling that practicing outside one's trained medical system constitutes malpractice.
- Bombay High Court Stay on 2017 Notification: The Bombay High Court issued a stay, questioning the risk posed to patients and highlighting the lack of authority to permit crosspathy.
- Suresh Bada Math et al. (2015 Research Analysis): The judiciary consistently upheld crosspathy as negligence, permitting it only where explicitly authorized by state governments.

Way Ahead:

- Evidence-Based Practices: Conduct large-scale clinical trials to validate the efficacy of homeopathic treatments and integrate them into modern healthcare guidelines.
- Educational Reforms: Introduce cross-disciplinary training programs for doctors to understand both systems, fostering collaboration.
- Strengthen Regulations: Develop a robust regulatory framework to govern integrative practices, ensuring safety and accountability.
- Public Awareness: Educate the public on the benefits and limitations of integrative healthcare to build trust in both systems.
- Pilot Projects: Initiate pilot programs in rural areas to test the effectiveness of integrative healthcare models.

Conclusion:

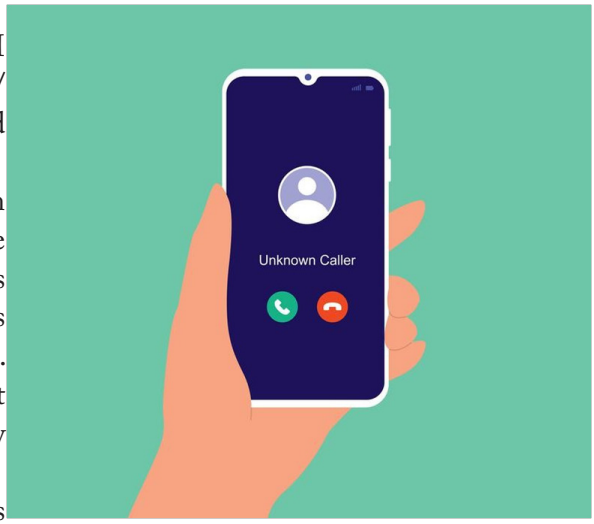
The integration of homeopathy and allopathy can revolutionize healthcare by combining the strengths of both systems. While challenges like trust deficits and regulatory issues remain, evidence-based practices and collaborative frameworks can pave the way for a more holistic and accessible healthcare model.

Spam Regulations

Context:

Spam, officially referred to as Unsolicited Commercial Communications (UCC), has become a persistent issue in India's telecom industry, leading to increasing public frustration and security risks.

About Government Measures to Tackle Spam:



- Do-Not-Disturb (DND) Registry: Introduced by TRAI in 2007, it allows customers to block commercial calls/ messages. Telemarketers violating it face warnings and blacklisting.
- Blockchain Technology (DLT): Under Telecom Commercial Communications Customer Preference Regulations (TCCCPR) 2018, blockchain ensures traceability of approved senders/templates. In 2024, rules tightened to track message origins and prevent tampering.
- Sanchar Saathi Portal: Launched by DoT to report fraudulent calls/messages, collaborating with banks, law enforcement, and telcos to cancel unauthorized numbers.
- Telecom Security Operation Centre: Monitors suspicious internet traffic in real-time to enhance action against spam, scams, and fraudulent communications.
- Artificial Intelligence Integration: Telcos like Airtel use AI to flag suspicious calls as "Suspected Spam." International calls are flagged to detect fraud via VoIP numbers.
- International Call Monitoring: Identifies and curbs fraudulent calls from leased VoIP numbers, ensuring real-time enforcement against scams.

Relevance in UPSC Exam Syllabus

GS Paper 2 (Governance):

- Regulatory Policies: Measures taken by TRAI and DoT to regulate UCC and ensure consumer protection.
- Role of Technology in Governance: Blockchain and AI as tools to enhance traceability and combat fraud.

GS Paper 3 (Science and Technology):

- Application of Technology: Use of DLT, AI, and real-time traffic monitoring for combating spam and scams.
- Cybersecurity: Tackling fraudulent calls, financial scams, and protecting digital infrastructure.

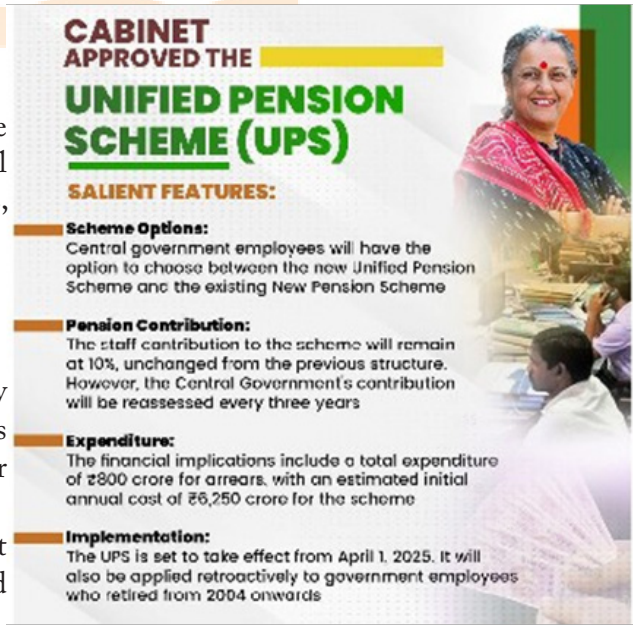
Essay and Ethics:

- Topics like "Balancing Digitization and Privacy" or "Ethical Use of Technology in Governance".

Unified Pension Scheme (UPS)

Context:

The finance ministry has notified the operationalization of the Unified Pension Scheme (UPS) as an option under the National Pension System (NPS) for central government employees, effective from April 1 of 2025.



About Unified Pension Scheme (UPS):

What is it?

- The Unified Pension Scheme (UPS) is a contributory pension scheme offering government employees guaranteed retirement benefits, including 50% of their last drawn basic pay as a monthly pension.
- Ministry: Introduced by the Ministry of Finance, it will be regulated by the Pension Fund Regulatory and Development Authority (PFRDA).
- Launched in: The UPS was approved by the Cabinet on August 24, 2024, and will be operational from April 1, 2025.
- Aim: The scheme aims to address employee grievances regarding the market-linked returns of the NPS by providing guaranteed benefits and ensuring financial security post-retirement.

Key Features:

- Guaranteed Pension: Employees will receive 50% of their average basic pay during the last 12 months before retirement.
- Dearness Relief: Regular hikes to adjust pensions based on inflation trends.
- Family Pension: In case of death, family members will receive 60% of the employee's pension.
- Superannuation Benefits: A lump sum payout alongside gratuity at retirement.
- Minimum Pension: A minimum of 10,000 per month for employees completing at least 10 years of service.

Contributions Under the Scheme:

- Employees contribute 10% of their basic pay.
- The government contributes 5% of the basic pay, which can be revised based on actuarial reviews to ensure sustainability.

Coverage:

- Applicable to Central Government employees who were previously covered under the NPS.
- Employees hired on or after January 1, 2004, including retirees, can opt to switch from NPS to UPS.

Transition from NPS to UPS:

- The NPS linked pensions to market-driven returns based on contributions, causing concerns over uncertainty.
- The UPS eliminates these concerns by guaranteeing lifelong monthly pensions, making it beneficial for an estimated 99% of NPS members.

Birthright Citizenship

Context:

Recently, discussions have intensified in the United States, where efforts to alter the interpretation of the 14th Amendment have sparked legal challenges.

About Birthright Citizenship:

In USA:

- 14th Amendment:
- Ratified in 1868, the 14th Amendment of the US Constitution states that all persons born or naturalized in the United States and subject to its jurisdiction are citizens of the country.
- It was introduced after the Civil War to ensure citizenship rights for freed slaves.

In India:

Constitutional Provisions (Article 5):

- Article 5 of the Indian Constitution initially granted citizenship by birth to anyone born in India before its commencement (January 26, 1950).
- The Citizenship Act, 1955, expanded this to include individuals born after this date, with limited exceptions (e.g., children of foreign envoys or enemy aliens).

Amendments to the Citizenship Act:

1986 Amendment:

- Restricted citizenship by birth to those with at least one parent as an Indian citizen.
- Addressed concerns over migration from Bangladesh and Sri Lanka.

2003 Amendment:

- Further restricted citizenship, excluding children born to illegal immigrants.
- This change aimed to control unauthorized migration and its impact on demographics.

Sachetisation Plan

Context:

The Securities and Exchange Board of India (SEBI) is introducing a sachetisation plan to enable small-ticket systematic investment plans (SIPs) starting at 250 per month.

About Sachetisation of Mutual Fund Investments:

What is Sachetisation?

- A strategy inspired by FMCG products offering small, affordable units (e.g., shampoo sachets) to penetrate price-sensitive markets.
- Applied to financial services, it allows low-income investors to enter mutual funds through smaller, affordable investments.

Need for Sachetisation:

- Financial Inclusion: Targets underserved, low-income groups to enable investment in mutual funds.
- Addressing Barriers: Overcomes the high entry costs of traditional mutual fund SIPs.
- Market Deepening: Expands the retail investor base in equity markets, stabilizing market flows against foreign investor volatility.

Aim of Sachetisation:

- Encourage small-ticket SIP investments to democratize access to financial products.
- Foster long-term savings and wealth creation, particularly for low-income investors.

How it works:

- Minimum SIP Amount: 250/month (targeted at new mutual fund investors).

Eligibility Criteria:

- Available for new investors only.
- Maximum of three 250 SIPs per investor across asset management companies (AMCs).
- Schemes Excluded: Debt schemes, sectoral, thematic, small-cap, and mid-cap equity funds due to their volatility.
- Commitment Period: Investors encouraged to commit to 5 years (60 instalments), but premature withdrawal is allowed.
- Technology-Driven Process: Investments through UPI auto pay or NACH to minimize costs.

NHM achievements 2021-24

Context:

The Cabinet reviewed achievements under the National Health Mission (2021-24), highlighting significant progress in strengthening India's public health outcomes.

Key Achievements under NHM (2021-2024):

Achievement Area	Key Milestones
COVID-19 Vaccination	Over 220 crore vaccine doses administered nationwide.
Human Resources	Engaged 12.13 lakh additional healthcare workers, including 3.57 lakh CHOs.
Maternal Mortality Ratio (MMR)	Declined by 83% since 1990, from 130 (2014-16) to 97 per lakh live births (2018-20).

Under-5 Mortality Rate (U5MR)	Reduced by 75% since 1990, from 45 (2014) to 32 per 1,000 live births (2020).
TB Elimination	Incidence reduced from 237/1,00,000 in 2015 to 195/1,00,000 in 2023.
Measles-Rubella Vaccination	Achieved 97.98% coverage, vaccinating over 34.77 crore children.
Sickle Cell Anemia	Screened 2.61 crore individuals under the National Sickle Cell Anemia Mission.
Ayushman Arogya Mandirs	Operationalized 1.72 lakh centers, with 1.34 lakh providing 12 essential services.
Dialysis Programme	Benefited 4.53 lakh patients with over 62.35 lakh hemodialysis sessions.
Kala Azar Elimination	Achieved target of <1 case/10,000 population in all endemic blocks.
Digital Health	Launched the U-WIN Platform for real-time vaccination tracking in 65 districts.
Public Health Infrastructure	Certified 7,998 health facilities under National Quality Assurance Standards.

Relevance in UPSC Exam Syllabus:

- General Studies Paper II: Governance and Social Justice
- NHM as a case study for improving healthcare accessibility and affordability.
- Schemes for vulnerable populations (MGNREGA, PMJDY, PMJAY, etc.).
- Disease elimination initiatives like TB, malaria, and Kala Azar.
- General Studies Paper III: Economic Development and Technology
- Role of digital health initiatives (U-WIN platform) in healthcare delivery.
- Linkages between healthcare infrastructure and human resource development.

Ad hoc Judges

Context:

The Supreme Court has proposed the temporary appointment of retired High Court judges on an ad hoc basis under Article 224A of the Constitution to address the growing backlog of criminal cases.

About Ad Hoc Judges:

- Constitutional Provision: Article 224A of the Indian Constitution allows the Chief Justice of a High Court to appoint retired High Court judges to perform judicial duties, with the prior consent of the President.
- Criteria for Appointment: Retired judges who have previously served in any High Court can be requested for temporary judicial service if they consent to the appointment.

Who Are Ad Hoc Judges?

- Ad hoc judges are retired judges invited back temporarily to help clear backlogs of cases in High Courts. They enjoy the same powers and privileges as sitting judges but are not deemed regular judges.

Procedure for Appointment:

- The Chief Justice of a High Court identifies potential candidates and seeks their consent.
- The recommendation is sent to the President of India, routed through the Union Law Ministry.
- The Supreme Court Collegium must also endorse the recommendation.
- The final decision is made by the President based on advice from the Prime Minister.

Term and Conditions:

- The tenure is typically 2-3 years, depending on the requirement.
- These judges are entitled to allowances determined by the President and enjoy all privileges of High Court judges during their term.

Misuse of Scheme

Context:

In 2024, 4.14 lakh insurance claims were found to be bogus in Maharashtra, revealing misuse of the scheme Pradhan Mantri Fasal Bima Yojana.

Leakages in Government Schemes:

- Bogus Claims: Farmers submitted fake claims for non-existent crops or on unauthorized lands, such as temples, government plots, and petrol pumps.

  E.g. A farmer in Nashik applied for insurance on a petrol pump plot.
- Manipulation by Middlemen: Common Service Centres (CSCs) filed false applications using forged documents without farmers' consent.

  E.g. 96 CSCs in Maharashtra are under scrutiny for irregularities.
- Lack of Verification: Absence of timely cross-checks allowed false claims to pass initial scrutiny.
- Administrative Challenges: High volume of applications delayed physical inspections, leading to systemic inefficiencies.
- Resource Drain: Misuse led to loss of public funds meant for genuine beneficiaries.

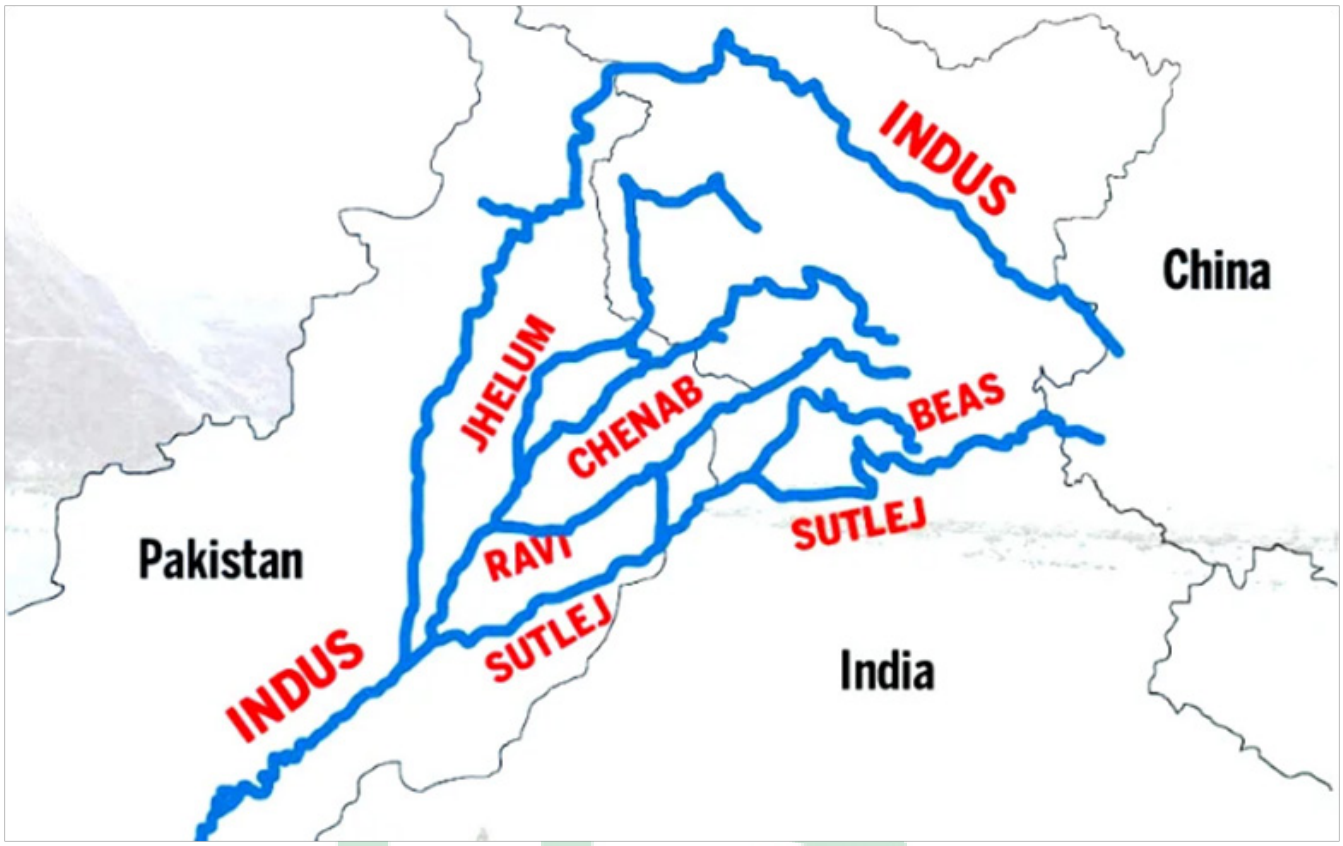
Relevance to UPSC Syllabus

- GS Paper 2 (Governance): Discusses implementation challenges in government schemes and issues of transparency.
- GS Paper 3 (Agriculture): Focuses on crop insurance, misuse of subsidies, and reforms for agricultural resilience.
- Ethics and Integrity: Highlights issues of moral responsibility among farmers and administrators.

Indus Water Treaty (IWT), 1960

Context:

The World Bank-appointed Neutral Expert (NE) has declared that he is competent to resolve differences between India and Pakistan regarding the design of hydroelectric projects under the Indus Water Treaty (IWT), 1960.



About World Bank's Neutral Expert:

- Neutral Expert (NE)
- Appointed by: The World Bank, under Paragraph 7 of Annexure F of the IWT.
- Role: Resolving technical disputes arising under the treaty when the Permanent Indus Commission (PIC) fails to find mutual agreement.
- Current Focus: Technical evaluation of the Kishenganga and Ratle hydroelectric projects.

Dams Under Issue:

- Kishenganga Hydroelectric Project:
- Location: Jhelum River, tributary of the Indus, Jammu & Kashmir.
- Ratle Hydroelectric Project:
- Location: Chenab River, tributary of the Indus, Jammu & Kashmir.

About Indus Water Treaty:

Established In:

- Signed in 1960 by Indian Prime Minister Jawaharlal Nehru and Pakistan President Ayub Khan.
- Brokered by the World Bank, which also serves as a signatory.

Nations Involved:

- India: Allocated water from eastern rivers – Beas, Ravi, and Sutlej.
- Pakistan: Allocated water from western rivers – Indus, Chenab, and Jhelum.

Features of the Treaty:

- Equitable distribution of the Indus River system's water.
- Permits certain uses of water by both nations, including hydroelectric projects.
- Oversight by the Permanent Indus Commission (PIC), consisting of commissioners from both countries.

World Bank's Role:

- Appoints a Neutral Expert to resolve technical differences.
- Facilitates arbitration through a Court of Arbitration if disputes cannot be resolved.
- Ensures the treaty's implementation and integrity.

One Nation, One Legislative Platform

Context:

The 85th All India Presiding Officers' Conference (AIPOC) concluded in Patna, Bihar, addressing critical issues in legislative proceedings, such as disruptions, decorum, and enhancing the role of legislative bodies.

- The conference also highlighted the upcoming One Nation, One Legislative Platform, aiming to unify all legislative bodies on a single digital platform.

About All India Presiding Officers' Conference (AIPOC):

Origin:

- Established in 1921, with the first conference held in Shimla.
- It is the apex body of Indian legislatures, bringing together presiding officers of Parliament and state legislatures.

2025 Conference Highlights:

- Held in Patna, Bihar, in the historic Bihar Legislature Premises.
- Resolutions focused on curbing disruptions, improving debate quality, and celebrating the 75th anniversary of the Constitution with public engagement initiatives.
- Aim: Strengthen democratic institutions by fostering accountability, transparency, and robust legislative practices.

Significance:

- Enhances coordination among legislative bodies.
- Promotes cooperative federalism and ensures legislatures effectively address local and national issues.
- Drives initiatives like digitization and public accessibility in legislative processes.

About One Nation, One Legislative Platform:

- What it is: A mission to integrate all legislative bodies of India—Parliament, state legislatures, and local bodies—onto a single digital platform.

Aim:

- Enable real-time sharing of legislative data and practices.
- Foster transparency, accountability, and public participation in legislative processes.
- Features of One Nation, One Legislative Platform:
- Integrated Digital Platform: Unifies Parliament, state legislatures, and local bodies on a single platform for seamless data sharing and coordination.
- Real-Time Information: Provides live updates on legislative proceedings, bills, and debates to enhance transparency and accessibility.
- AI and Technology Integration: Utilizes Artificial Intelligence to streamline legislative functioning, analyze data, and improve decision-making.
- Paperless Legislatures: Promotes eco-friendly practices by digitizing legislative records, reducing dependency on physical documentation.
- Public Accessibility: Ensures citizens can access legislative information, encouraging participation and fostering accountability.

Draft Regulations for the Selection and Appointment of Vice Chancellors

Context:

The University Grants Commission (UGC) recently released draft regulations for the selection and appointment of Vice Chancellors (VCs) in universities, sparking controversy.

Key Features of UGC Draft Regulation on Vice Chancellors:

1. Search-cum-Selection Committee Formation:

- The Chancellor/Visitor will form a three-member Search-cum-Selection Committee.
- The committee will include nominees from the Chancellor/Visitor, UGC Chairman, and the university's apex body (Senate/Syndicate/Executive Council).

2. Inclusion of non-academics:

- Professionals from public policy, public administration, or industry with over 10 years of experience are now eligible for VC roles.

3. Standardized Selection Process:

- Introduces uniform criteria for selection across central, state, and private universities.

4. Mandating UGC Nominee:

- Makes it mandatory to include a UGC nominee in the Search-cum-Selection Committee for state universities.

5. Alignment with NEP 2020:

- Proposes reforms in line with the objectives of the National Education Policy (NEP) 2020, emphasizing quality, transparency, and inclusivity.

Positives of the proposed draft:

- Standardized Framework: Ensures uniformity in the selection process, enhancing quality across universities. E.g. Supported by SC in Kalyani Mathivanan v. K.V. Jeyaraj, 2015.
- Increased Transparency: Defined processes and criteria reduce discretionary powers, making appointments more transparent.
- Widened Talent Pool: Inclusion of professionals from non-academic backgrounds brings diverse perspectives to higher education governance.
- Alignment with NEP 2020: Promotes holistic reforms aimed at improving the quality of higher education.
- Focus on Governance Standards: Encourages best practices in administration by introducing experienced professionals.

Issues with the proposed draft:

- Violation of State Autonomy: Mandating a UGC nominee in state universities undermines state legislations.
  E.g. Kerala's stance on UGC's role in VC appointments underscores this conflict.)
- Constitutional overreach: UGC regulations are subordinate legislation and cannot override State University Acts.
  E.g. SC ruling in Ch. Tika Ramji v. State of UP, 1956.
- Federal Principles at Stake: States argue that increased central involvement violates the federal structure.
  E.g. Tamil Nadu and Kerala have opposed this citing erosion of their authority.
- Ambiguity in Non-Academic Eligibility: Inclusion of professionals from public administration and industry without clear academic experience may dilute educational standards.
- Potential political interference: Greater control by Governors, often seen as Central appointees, could lead to politically influenced appointments.
  E.g. Recent controversies in West Bengal and Tamil Nadu reflect this concern.

Way ahead:

- Strengthen consultation with states: UGC should engage state governments to align the regulations with state-specific needs.
- Define eligibility clearly: Criteria for non-academic candidates should include a demonstrated contribution to education or policy.
- Adopt flexibility: Allow states the discretion to adopt or modify the regulations as per their governance frameworks.
  E.g. SC ruling in P.J. Dharmaraj v. Church of South India, 2024.
- Preserve federal balance: Regulations should respect state legislations to maintain the cooperative federal structure.
- Judicial clarification: Seek a definitive ruling by a Constitutional Bench to address ambiguities in the overlapping jurisdiction of UGC and state laws.

Conclusion:

The UGC's draft regulations aim to standardize VC appointments and improve governance, but they raise significant constitutional and federal concerns. Resolving these issues requires a balance between state autonomy and central oversight, ensuring the shared goal of quality education.

Contract Farming

Context:

India has transitioned from being an importer to a major exporter of frozen French Fries (FF), with exports exceeding domestic consumption due to contract farming.

About Contract Farming:

What is Contract Farming?

- Contract farming involves agreements between farmers and buyers (companies, exporters, etc.) where the farmer commits to producing specific crops in exchange for assured procurement, predetermined pricing, and sometimes input support.

Success Examples of Contract Farming

French Fries Export in Gujarat:

- Companies like HyFun Foods partner with farmers, offering guaranteed prices, quality seeds, and training. Farmers benefit from reduced uncertainty and increased profits.
- Example: HyFun procures potatoes from over 7,000 farmers in Gujarat, ensuring stable incomes and high-quality produce.

Sugarcane in Maharashtra:

- Sugar mills engage in contract farming to ensure a consistent supply of sugarcane, providing seeds, fertilizers, and technical support to farmers.

ITC's E-Choupal:

- ITC supports soybean farmers by providing market information, quality seeds, and inputs, leading to improved yields and better prices.

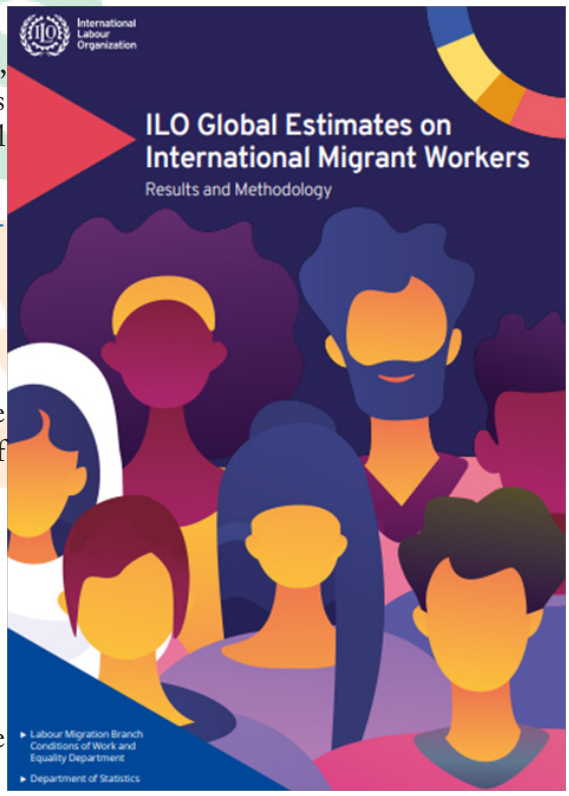
Dairy Farming:

- Amul and other dairy cooperatives contract with farmers for milk supply, ensuring fair prices and quality standards

Global Estimates on International Migrant Workers 2022 Report

Context:

The Global Estimates on International Migrant Workers 2022, released by the International Labour Organization (ILO), highlights the significant role of international migrants (IMs) in the global workforce.



About Global Estimates on International Migrant Workers Report:

- Published by: International Labour Organization (ILO).

Key data insights:

- Global Share: IMs constituted 4.7% of the global labor force in 2022, amounting to 167.7 million workers, an increase of over 30 million since 2013.

Gender Dynamics:

- Male Workers: 61.3% of IMs (102.7 million).
- Female Workers: 38.7% of IMs (64.9 million).

Age Distribution:

- Prime-age adults (25–54 years): 74.9% of IMs, forming the largest demographic group.
- Youth (15–24 years): 9.3%.
- Older adults (55–64 years): 12.5%.
- Seniors (65+ years): 3.4%.

Sectoral Distribution:

- Services Sector: Dominates with 68.4% of IMs, especially in care-related roles (higher for women at 80.7%).
- Industry: 24.3%.
- Agriculture: Only 7.4%, significantly lower than non-migrant workers (24.3%).

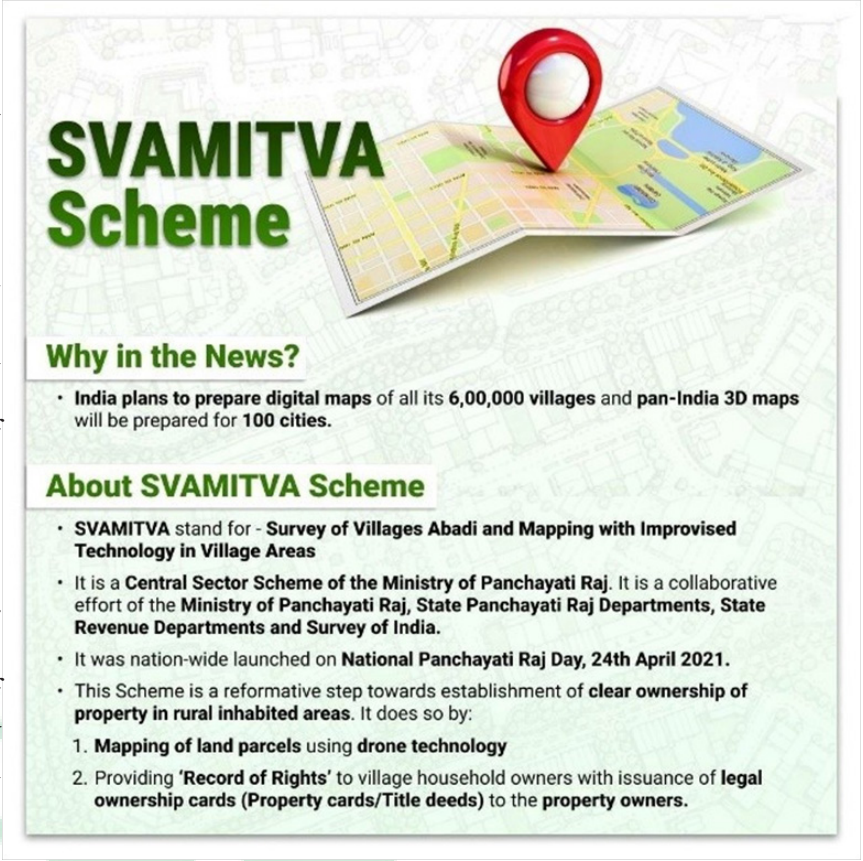
Host Countries:

- High-income countries: Host 68.4% (114 million) of IMs, especially in Europe and North America.
- Upper-middle-income countries: Absorb 17.4% (29.2 million).
- Arab States: Account for 13.3% of IM workers, with a slight decline over the decade.

SVAMITVA Scheme

Context:

Prime Minister is set to distribute over 65 lakh property cards under the SVAMITVA Scheme via video conferencing.



About SVAMITVA Scheme:

- Full Form: Survey of Villages and Mapping with Improvised Technology in Village Areas.
- Launched: In 2020 as a Central Sector Scheme.
- Nodal Ministry: Ministry of Panchayati Raj (MoPR).

Aim:

- To empower rural property owners by providing Record of Rights for properties.
- Facilitate the economic growth of rural India by enabling property monetization and access to financial resources.

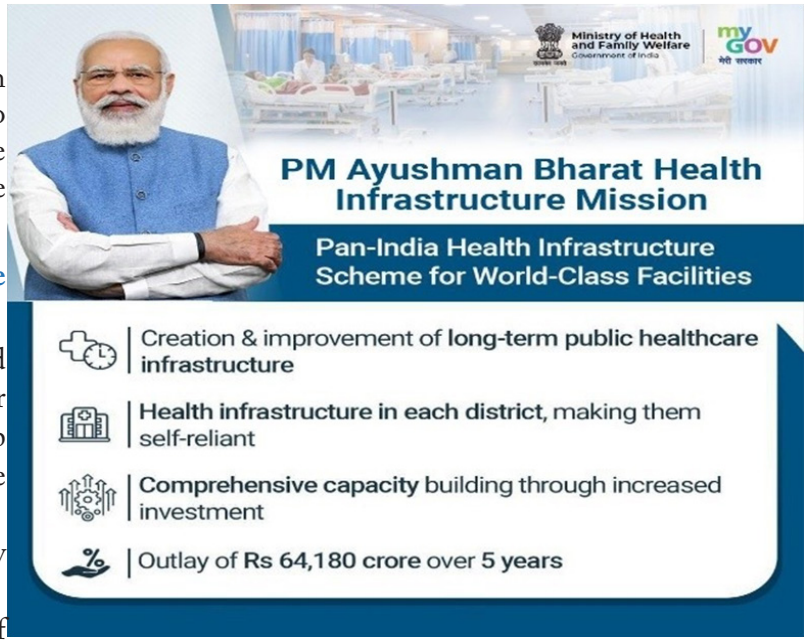
Features:

- Advanced Technology: Drone technology and Continuously Operating Reference Station (CORS) for accurate surveying and mapping of rural inhabited areas.
- Property Cards: Official documents provided to property owners for financial and legal uses.
- Reduction in Disputes: Minimize property-related disputes by creating precise land records.
- Financial Inclusion: Property cards can be used as collateral for loans, promoting rural financial stability.
- Development Planning: GIS maps generated under the scheme aid in better Gram Panchayat Development Plan (GPDP) preparation.
- Coverage: Drone surveys have been completed in over 17 lakh villages, with saturation achieved in six states and UTs, including Puducherry and Tripura.

PM-Ayushman Bharat Health Infrastructure Mission (PM-ABHIM)

Context:

The Supreme Court stayed the Delhi High Court's directive for the Delhi government to sign an MoU with the Centre to implement the PM-Ayushman Bharat Health Infrastructure Mission (PM-ABHIM).



PM-Ayushman Bharat Health Infrastructure Mission (PM-ABHIM):

- What it is: A Centrally Sponsored Scheme (CSS) with some Central Sector components (CS), launched to develop and strengthen healthcare infrastructure across India.
- Ministry: Ministry of Health and Family Welfare, Government of India.
- Launched in: 2021-22, with a budget of 64,180 crore for the period 2021-22 to 2025-26.

- Aim: To bridge critical gaps in healthcare infrastructure, strengthen surveillance systems, and enhance health research capabilities at all levels—primary, secondary, and tertiary care.

Key Features:

National Components:

- Establishment of 12 Central Institutions with 150-bedded Critical Care Blocks.
- Strengthening the National Centre for Disease Control (NCDC) and creation of regional NCDCs and metropolitan health surveillance units.
- Expansion of the Integrated Health Information Portal to link all public health labs.
- Setting up 15 Health Emergency Operation Centres, mobile hospitals, and specialized public health units at airports, seaports, and land crossings.

State Support:

- Construction of 17,788 rural Health and Wellness Centres (HWCs) for better accessibility in rural and difficult areas.
- Establishment of 11,024 urban HWCs focusing on slum-like areas.
- Development of 3,382 Block Public Health Units (BPHUs) and Integrated Public Health Labs (IPHLs) in 730 districts.
- Creation of Critical Care Hospital Blocks (CCBs) in 602 districts with populations over 5 lakh, ensuring robust referral linkages.

Pandemic Preparedness:

- Creation of One Health institutions, new National Institutes for Virology, and Biosafety Level III labs for research and disaster readiness.

Focus on Urban and Rural Areas:

- Specific health infrastructure targeting slum populations and hard-to-reach rural regions.

Bharat Ranbhoomi Darshan

Context:

On the 77th Army Day, Defense Minister launched Bharat Ranbhoomi Darshan, a dedicated website aimed at promoting battlefield and border tourism.

About Bharat Ranbhoomi Darshan:

- What it is: A comprehensive website providing information about significant battlefields and border areas in India, offering virtual tours, historical narratives, and travel assistance.
- Ministry: Launched under the Ministry of Defence, in collaboration with the Ministry of Tourism.

Aim:

- Promote battlefield tourism and border tourism.
- Enhance awareness of India's military history and valor.
- Drive socio-economic development in border regions.

Places included:

- Galwan Valley (Ladakh), site of the 2020 India-China clash.
- Doklam (tri-junction between India, Bhutan, and China).
- Sites along the Line of Control (LoC) and Line of Actual Control (LAC), including Nathu La Pass, Longewala, and locations from the 1962 and 1971 wars.

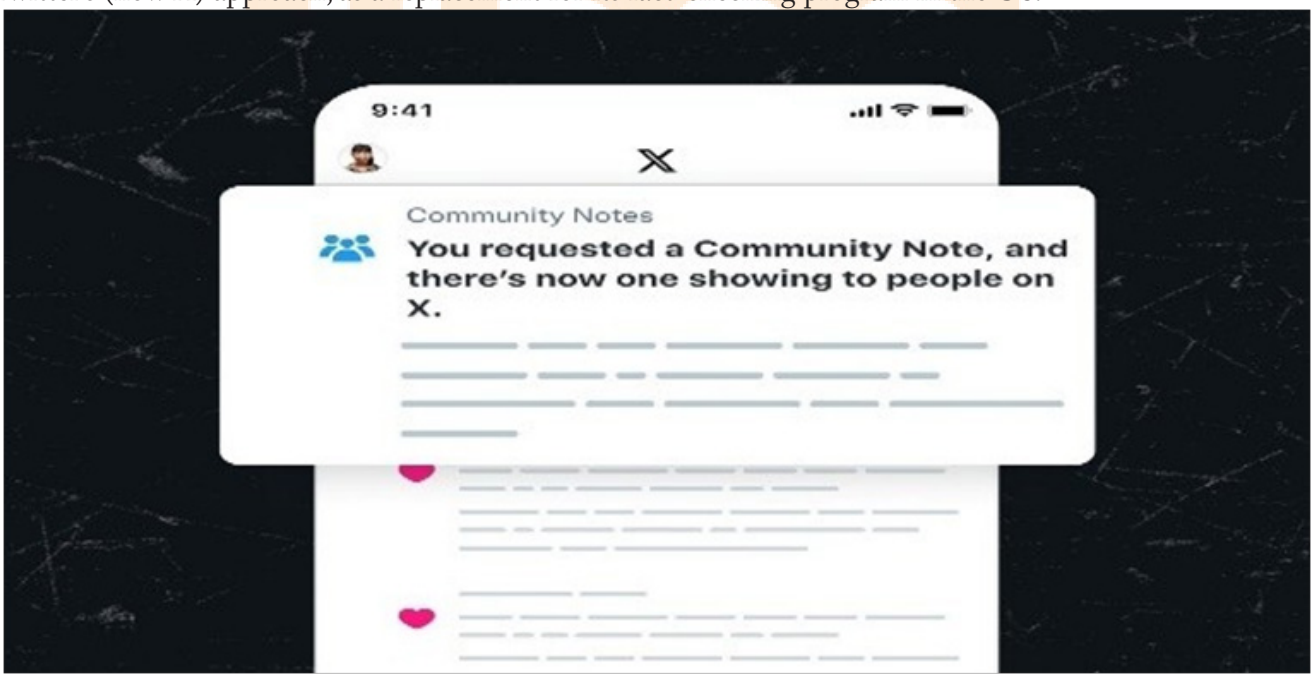
Features:

- Virtual Tours: Visitors can explore battlefields through interactive experiences.
- Travel Guidance: Information on permits and travel arrangements to these locations.
- Collaborative Infrastructure: Joint efforts by the Indian Army and civil authorities to maintain access while preserving operational preparedness.
- Tourism Integration: Included in the Incredible India campaign to attract domestic and international tourists.

Community Notes

Context:

Meta recently announced the adoption of Community Notes, a crowdsourced content moderation system similar to Twitter's (now X) approach, as a replacement for its fact-checking program in the US.



About Community Notes:

What is it?

- Community Notes is a crowdsourced fact-checking system where users can add context or facts to specific posts.
- Launched by: Originally piloted as 'Birdwatch' by Twitter in 2021, rebranded as X, it is now being adopted by Meta across Facebook, Instagram, and Threads.

How it works:

- Contributors provide additional context below posts.
- Notes appear only if enough users agree on their helpfulness, ensuring diverse perspectives.
- Data is public, allowing anyone to analyse contributions for transparency.

Significance:

- Scalable Content Moderation: Reduces reliance on centralized fact-checkers.
- Community-driven Transparency: Empowers users to counter misinformation collectively.
- Adaptable System: Improves accuracy with increasing user participation and algorithmic refinements.

Dissent in Judiciary

Context:

Dissent is vital to democracy, including in constitutional courts. While powerful in both India's Supreme Court and the U.S. Supreme Court, their underlying reasons differ.

What Is Dissent in Judiciary?

- Definition: A dissent is a disagreement by one or more judges with the majority opinion in a judicial decision.
- Significance: It reflects an alternate interpretation of law, strengthens democratic dialogue, and influences future legal developments.

Types of Judicial Dissents:

Intellectual Dissent:

- Based on logical or textual differences in interpreting laws.
- Example: Justice B.V. Nagarathna's dissent in Lalta Prasad Vaish (2024) on taxing industrial alcohol under "intoxicating liquor."

Political Dissent:

- Stems from judicial resistance to political influences.
- Example: Justice H.R. Khanna's dissent in ADM Jabalpur (1976) upheld the sanctity of Article 21 during the Emergency.

Social Dissent:

- Reflects contrasting views on societal or cultural issues.
- Example: Justices Khehar and Nazeer's dissent in Shayara Bano (2017) upheld triple talaq as integral to Sunni personal law.

Differences Between Indian and U.S. Judicial Dissents:

Aspect	India	USA
Appointment Process	Judges are appointed through the collegium system, largely independent of politics.	Judges are directly appointed by the President and confirmed by the Senate, reflecting political leanings.
Basis of Dissent	Dissents often focus on legal interpretation, societal issues, and intellectual critique.	Dissents are frequently influenced by political ideologies (liberal vs. conservative).

Political Impact	Judgments are generally apolitical, with dissent reflecting institutional independence.	Dissents often align with the appointee's partisan alignment (e.g., Republican or Democrat).
Judicial Philosophy	Judges emphasize constitutional morality and evolving societal norms.	Judges' dissents reflect originalist or progressive interpretations of the Constitution.
Examples	Justice H.R. Khanna's dissent in ADM Jabalpur upheld individual rights over politics.	Justice Alito's dissent in Obergefell v. Hodges reflected conservative opposition to same-sex marriage.

Recent Indian Examples of Dissent:

1. Sita Soren (2023): Overruled the immunity for bribes under parliamentary privilege dissenting against P.V. Narasimha Rao (1998).
2. Hijab Case (2022): Justice Dhulia's dissent emphasized diversity over secularism in State-run schools.
3. Lalta Prasad Vaish (2024): Justice Nagarathna's dissent on States' inability to tax industrial alcohol.

Consequences of Political Dissents:

- Democratic Strengthening: Upholds judicial independence, ensuring that courts act as a check on executive and legislative powers.
- Catalyst for Reform: Influences constitutional amendments and future legislation by exposing flaws in majority judgments.
- Public Perception: Shapes public understanding of judicial impartiality, but dissent in politically charged cases may raise concerns about bias.
- Judicial Integrity Risks: Political dissents might be perceived as partisan, undermining trust in judicial neutrality.
- Professional Repercussions: Judges expressing dissent in politically sensitive cases may face criticism or isolation within judicial and public domains.

Way ahead:

- Fostering Judicial Independence: Strengthen the judiciary's autonomy by protecting it from political and executive pressures.
- Encourage Open Discourse: Promote constructive debates within judicial forums to enrich legal reasoning and jurisprudence.
- Training and Awareness: Provide judges with exposure to global judicial practices to balance individual rights with societal needs.
- Institutional Safeguards: Develop mechanisms to shield dissenting judges from external criticism or professional isolation.
- Leveraging Technology: Enhance accessibility of dissenting opinions to educate citizens about alternative legal interpretations.

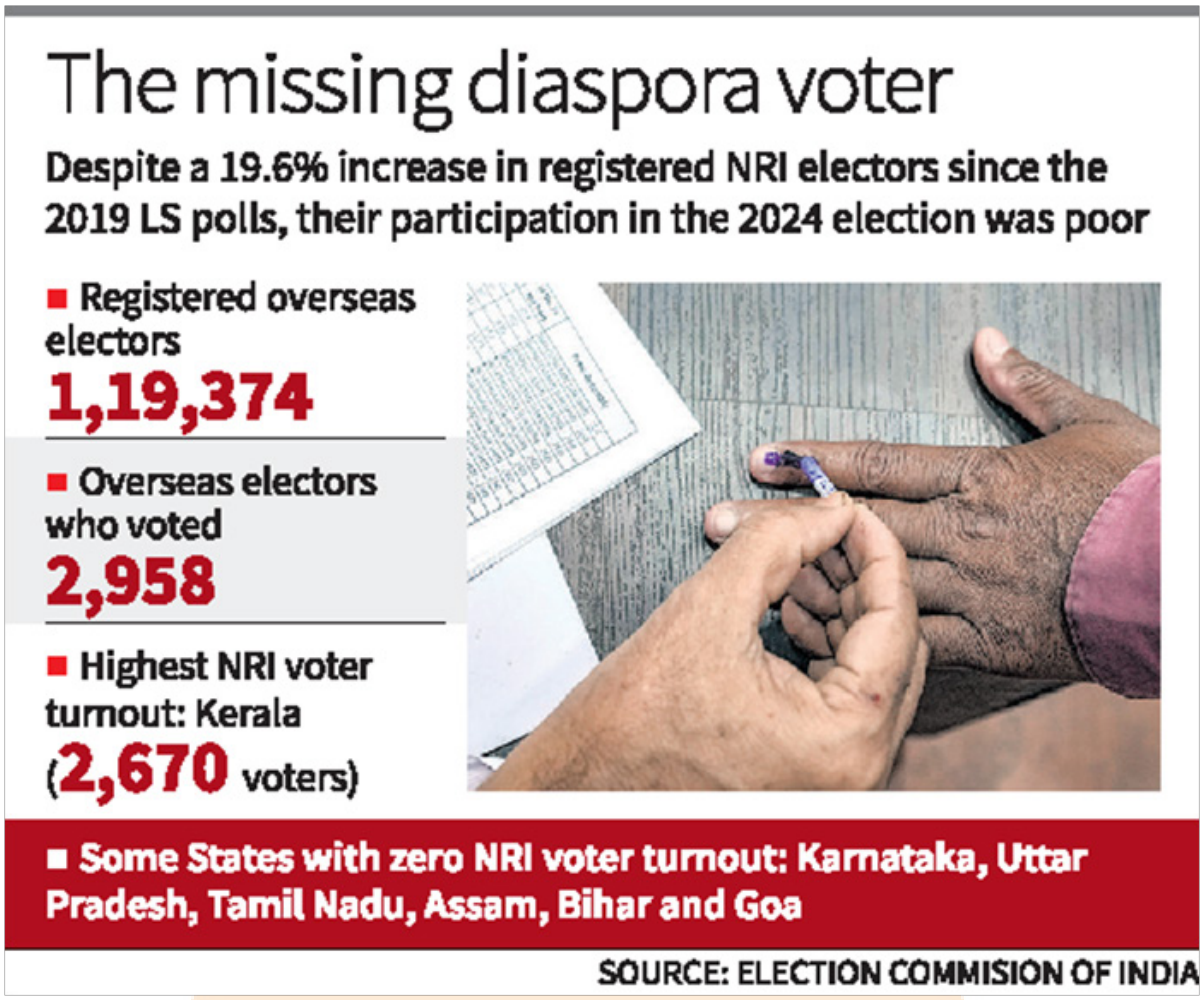
Conclusion:

Judicial dissent is a cornerstone of a vibrant democracy, allowing alternative perspectives to refine jurisprudence and protect constitutional values. In India, dissents have significantly shaped constitutional interpretation, enhancing public trust in the judiciary.

Overseas Voters in India

Context:

Overseas Indian voter participation in the 2024 Lok Sabha elections remains low despite rising registrations, highlighting challenges and sparking calls for voting reforms for Non-Resident Indians.



Overseas Voters in 2024 Lok Sabha Elections:

- Definition: Overseas voters, officially termed as overseas electors, are Indian citizens residing abroad but registered to vote in their respective constituencies in India.
- Eligibility: Must hold an Indian passport and register in their home constituency's electoral roll.

Data (Source: Election Commission of India)

Registrations:

- 2024: 1,19,374 registered overseas electors (highest in Kerala: 89,839).
- 2019: 99,844 registrations.
- Turnout: Only 2,958 overseas electors voted, with 2,670 from Kerala.
- Significance: NRIs represent a significant part of India's global footprint, and their participation strengthens India's democratic inclusivity.

Challenges in Participation:

- Travel costs and employment commitments deter voting.
- Current laws require Non Resident Indians (NRIs) to vote in person, which is restrictive.

Proposed Reforms:

- Introduction of Electronically Transmitted Postal Ballot System (ETPBS) for NRIs.
- Proxy voting rights, as proposed in 2018, remain unimplemented.

Private Members Bills

Context:

During the 17th Lok Sabha (2019–2024), only 9.08 hours were spent discussing Private Members Bills in the Lok Sabha and 27.01 hours in the Rajya Sabha.

What is a Private Member's Bill?

- A legislative proposal introduced by Member of Parliament (MPs) who are not part of the government.
- Represents individual MPs' legislative priorities or public issues outside the official government agenda.
- Can be introduced by both ruling and opposition party MPs.

Features:

- Non-Binding: Rejection does not affect the government's confidence or stability.
- Legislative Independence: Reflects the independent voice of parliamentarians.
- Historical Significance: Only 14 Private Members' Bills have become law; the last was passed in 1970.
- Scheduling: Reserved for discussion on Fridays, limiting its time and priority.

Procedure in the House:

- Drafting and Notice: The member drafts the Bill and gives a one-month notice before introduction.
- Introduction: Introduced in the House, followed by initial discussion and possible referral to a committee.
- Debate: If selected, the Bill is debated during the allotted Friday session.
- Decision: The member may withdraw it on the minister's request or proceed for voting.

Insta links:

UDISE+ 2023-24 Report

Context:

The Unified District Information System for Education Plus (UDISE+), a data aggregation platform under the Ministry of Education, has released its 2023-24 report.

About UDISE+:

- What it is: A comprehensive database for school education in India, launched to collect, analyze, and track data at the national level.
- Ministry: Ministry of Education, Government of India.
- Aim: To ensure transparency, monitor progress, and identify gaps in education through accurate, student-wise data collection.

Key data insights:

Enrolment Drop (Overall):

Category	2022-23 (in Cr)	2023-24 (in Cr)
Total Enrolment	25.17	24.8
Girl Students	12.09	11.93
Boy Students	13.08	12.87

Enrolment Drop by Category:

Category	2022-23 (in Cr)	2023-24 (in Cr)
Scheduled Castes	4.59	4.47
Scheduled Tribes	2.48	2.46
OBCs	11.45	11.2
Muslim Students	3.93	3.92
Minorities	5.01	4.98

Issues in Indian Education:

- Access and Retention: High dropout rates, particularly at the secondary level, hinder consistent student progression.
- Marginalized Communities: Significant enrollment declines among SC, ST, OBC, and minority groups indicate systemic inequities.
- Infrastructure Utilization: Uneven utilization of school infrastructure, with some states underusing resources while others face shortages.
- Quality of Education: Gaps in teacher training and availability reduce learning outcomes and student engagement.
- GER Decline: Gross Enrolment Ratios for marginalized groups have declined across foundational, preparatory, middle, and secondary levels.

Way Ahead:

- Policy Implementation: Strengthen NEP 2020 initiatives to achieve universal Gross enrolment ratio (GER) by 2030 and integrate skill-based learning.
- Inclusive Education: Ensure equitable access to education for SC, ST, OBC, and minority students through targeted programs.
- Teacher Training: Focus on enhancing teacher quality and bridging gaps in the student-teacher ratio.
- Infrastructure Optimization: Optimize school resources to align with enrolment trends and improve access.
- Monitoring and Data: Leverage student-wise data tracking to identify dropouts and allocate resources efficiently.

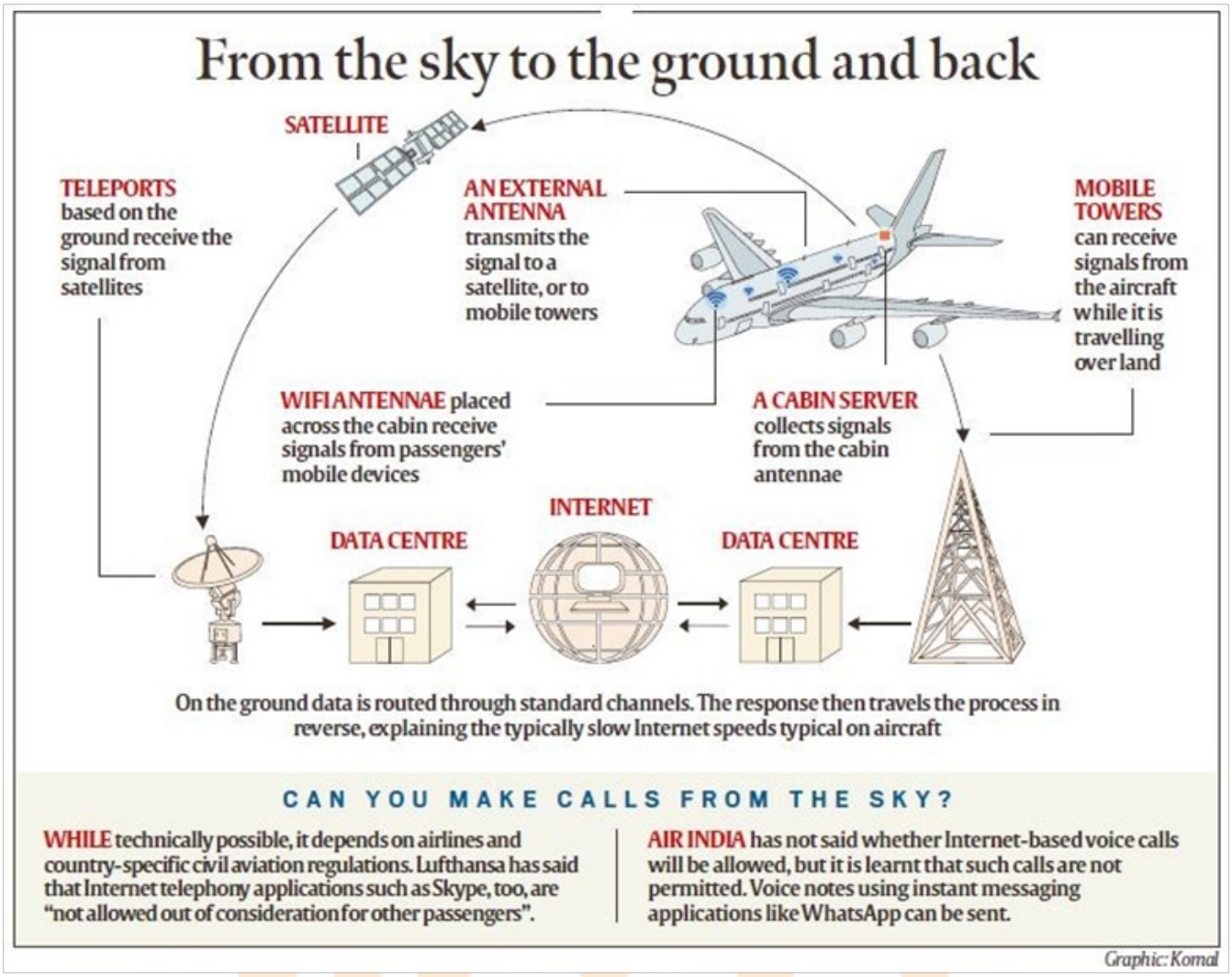
Conclusion:

The UDISE+ 2023-24 report highlights critical gaps in India's education system, including declining enrolment and inequities in access. By focusing on inclusive policies, quality education, and infrastructure optimization, India can work towards a more robust and equitable education system.

In Flight Internet

Context:

Air India, part of the Tata Group, has become the first Indian airline to offer in-flight Internet on domestic flights.



About In-Flight Internet:

- What it is: In-flight Wi-Fi provides passengers with Internet connectivity during flights, enabling access to online services like browsing, streaming, and messaging.

How it works:

- Technology used: Two primary systems – Air-to-Ground (ATG) and Satellite-Based Connectivity.
- ATG: Uses antennae under the aircraft to connect with ground cellular towers. Suitable for regions with dense tower networks.
- Satellite-Based: Uses antennae on top of the aircraft to communicate with satellites, ensuring wider coverage, especially over oceans and remote areas.

Signal Transmission:

- Devices connect to in-cabin Wi-Fi antennae.
- Signals pass through an onboard server.
- For satellite systems, signals move from the server to satellites, then to ground stations, and back via the same route.
- For ATG systems, signals travel directly between the aircraft and ground cellular towers.

Features and Benefits:

- Enhanced Passenger Experience: Browsing, streaming, and connecting with the world mid-air.
- Convenience: Integration with existing airline portals for seamless connectivity.
- Flexibility: Compatibility with multiple devices.

Limitations of In-Flight Wi-Fi:

- Slower Speeds: Typically, slower than ground-based Internet due to technological constraints.

- High Costs: Expensive equipment installation and maintenance for airlines, with potential charges for passengers.
- Limited Coverage: ATG technology struggles over large water bodies or remote areas.

UGC Draft Regulations 2025

Context:

Union Education Minister Dharmendra Pradhan unveiled the UGC Draft Regulations 2025, which introduce significant reforms in the appointment of Vice-Chancellors (VCs) and academic staff, aligned with the National Education Policy (NEP) 2020.

Draft Guidelines for Vice-Chancellor Appointment:

- Organisation involved: University Grants Commission (UGC).

Key features of VC appointment guidelines:

- Authority for Selection: Chancellors or Visitors are empowered to form a three-member search-cum-selection committee for appointing VCs.

Selection Process:

- Applications are invited via all-India newspaper advertisements or through nomination/talent search processes.
- A committee consisting of nominees from the Visitor/Chancellor (Chairperson), UGC Chairperson, and the university's apex body (e.g., Senate, Syndicate) selects the VC.

Eligibility:

- Distinguished professionals from academia, industry, public administration, or policymaking with proven academic contributions are eligible.
- Inclusivity: Encourages representation of economically weaker sections (EWS), SC, ST, OBC, and persons with disabilities.
- Transparency: Mandates public notification and objective assessment methods.

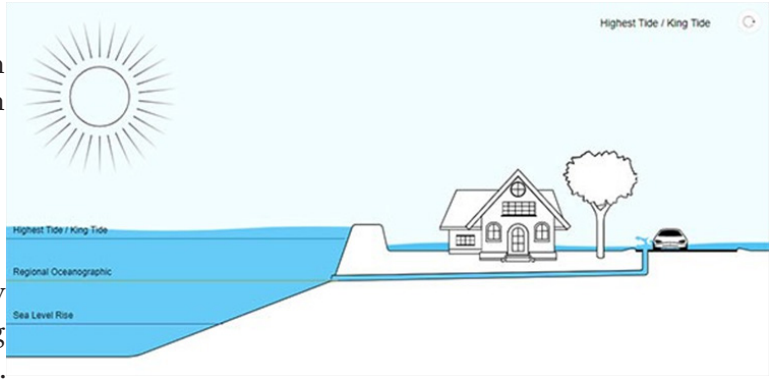
Consequences of Non-Compliance:

- Non-compliance with these guidelines may result in institutions being barred from UGC schemes or offering degree programs.

Tidal Flooding

Context:

Tidal flooding has become frequent in Ernakulam district lately. With the invading water staying on longer, more areas are getting affected.



About Tidal Flooding:

What is Tidal Flooding?

- Tidal flooding refers to the temporary inundation of low-lying coastal areas during high tide events, such as full and new moons.
  It is often called sunny day flooding or king tide flooding when associated with extreme high tides.

How Does It Occur?

- Tidal flooding occurs when the combination of high tide, offshore storms, winds, and full moon cycles leads to a temporary rise in local sea levels. Coastal drainage systems often fail to cope with this sudden increase, resulting in localized flooding.

Factors Influencing Tidal Flooding:

- Rising Sea Levels: Melting glaciers, thermal expansion, and land subsidence increase the baseline sea level.
- Storm Surges: Hurricanes and offshore storms amplify water levels during high tides.
- Climate Change: Warmer oceans contribute to stronger storms and more intense tidal events.
- Local Geography: Coastal erosion and low-lying topography make certain regions more vulnerable.

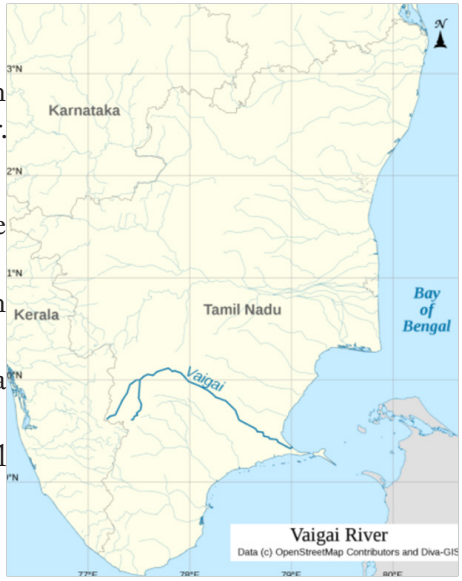
Impacts of Tidal Flooding:

- Infrastructure Stress: Repeated flooding damages roads, buildings, and drainage systems.
- Economic Costs: Increased maintenance costs and reduced property values in flood-prone areas.
- Environmental Degradation: Flooding disrupts ecosystems and accelerates coastal erosion.
- Safety Risks: While typically not life-threatening, tidal flooding complicates emergency responses during larger storm events.
- Managed Retreat Needs: Vulnerable areas may eventually require relocation to avoid repetitive damage.

Vaigai River

Context:

The Madurai Bench of the Madras High Court has directed local bodies in Tamil Nadu's to prepare an actionable timeline to rejuvenate the Vaigai River.



About Vaigai River:

- Origin: The Vaigai River originates from the Varusanadu Hills on the Periyar Plateau in the Western Ghats.
- End Point: It empties into the Palk Strait, near the Pamban Bridge in Ramanathapuram district.
- Tributaries: Major tributaries include Suruliyaru, Mullaiyaru, Varaaga Nadhi, Manjalaru, Kottagudi, Kridhumaal, and Upparu.
- Flow through states: It primarily flows through the state of Tamil Nadu.

Dams and Features:

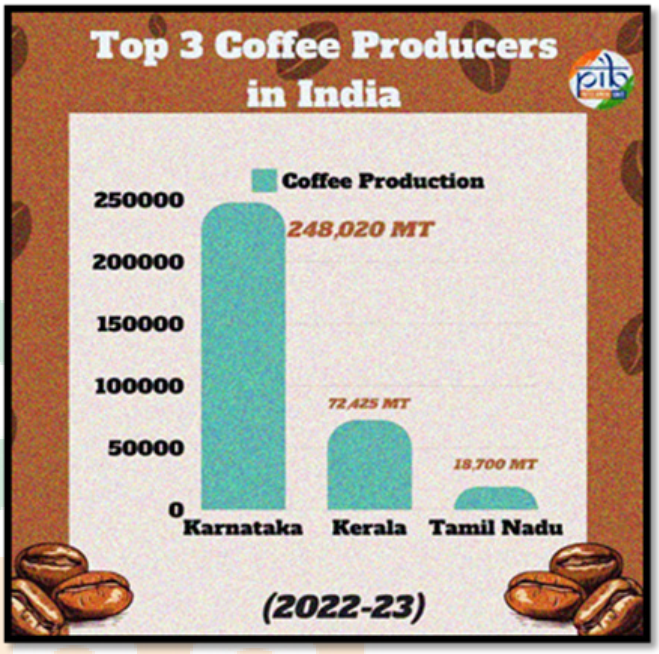
- Vaigai Dam: A crucial structure for irrigation and water storage located near Andipatti in Theni district.
- Vattaparai Falls: A notable waterfall situated on the river.

Cultural and Historical Significance:

- Revered in Sangam literature, dating back to 300 BCE.
- Known as Kritamaala, symbolizing its flow around Madurai like a garland.
- Mentioned in Thiruvilayadal Puranam, emphasizing its association with the Pandya kingdom.

Coffee

Context:



India is now the seventh-largest coffee producer globally with exports reaching $1.29 billion in FY 2023-24, almost double the $719.42 million in 2020-21.

About Coffee:

- Origin: Coffee was introduced to India in the 1600s when Baba Budan, a Sufi saint, planted seven Mocha coffee beans from Yemen in Karnataka's Baba Budan Giri region. This marked the beginning of India's coffee cultivation.

Types of Coffee:

- Arabica: Known for its mild, aromatic flavor and higher market value.
- Robusta: Hardier, with a strong taste, often used in instant coffee production.

Climatic Conditions for Coffee Cultivation:

- Temperature: Ideal range is 15°C to 28°C.
- Rainfall: Requires 150-250 cm of annual rainfall.
- Soil: Grows best in well-drained, loamy soil rich in humus and minerals like iron and calcium.
- Climate: Thrives in a hot, humid climate with shaded plantations.
- Elevation: Typically cultivated at altitudes of 600–1,600 meters above sea level.

India in Coffee Production:

- Global Ranking: India ranks seventh in global coffee production.
- Exports: Over 70% of coffee production is exported, with Italy, Belgium, and Russia being major buyers.

State-wise Production:

1. Karnataka: Largest producer, contributing over 70% of India's coffee.

2. Kerala: Second largest producer.
3. Tamil Nadu: Third in production.
4. Other States: Andhra Pradesh, Odisha, and the northeastern regions contribute marginally.

Asan Wetland

Context:

The Asan Wetland in Uttarakhand recently hosted the Asian Waterbird Census, yielding data on 5,225 birds across 117 species.

About Asan Wetland:

- Location: Situated in Dehradun district, Uttarakhand, at the confluence of the Asan River and the Eastern Yamuna Canal.
- Lies near the borders of Uttarakhand and Himachal Pradesh.

Rivers and History:

- Created due to the damming of the Asan River at the Asan Barrage (Dhalipur Lake) in 1967 during the construction of the Dhalipur powerhouse.
- Declared Uttarakhand's first Ramsar site in 2020, highlighting its global ecological significance.

Uniqueness and Features:

- Biodiversity Hub: Home to 330 bird species, including critically endangered white-rumped vulture, red-headed vulture, and Baer's pochard.
- Migratory Birds: Provides shelter to globally endangered species like Brahminy duck, red-crested pochard, gadwall, and mallard, migrating from Central Asia.
- Fish Species: Hosts 49 fish species, including the endangered Putitor mahseer.
- Wetland Ecosystem: Vital for maintaining ecological balance, supporting hydrological regimes, and enabling biodiversity.

About Asian Waterbird Census (AWC):

- Conducted By: The Asian Waterbird Census (AWC) is coordinated by Wetlands International as part of the global International Waterbird Census (IWC).

- Frequency: The AWC is an annual citizen science event held during the months of January to coincide with the migration season of waterbirds.

Bharathapuzha River

Context:

In a tragic incident, four members of a family drowned in the Bharathapuzha River in Cheruthuruthy, Kerala.

About Bharathapuzha River:

- Location and Length: The Bharathapuzha River, also called the Nila River or Ponnani River.
- Origin and Flow: The river originates from the Anaimalai Hills in Tamil Nadu and flows westward through the Palakkad Gap in the Western Ghats before emptying into the Arabian Sea.
- Tributaries: Kannadipuzha, Kalpathipuzha, Gayathripuzha, and Thuthapuzha, enriching its basin.
- Geographical Spread: The river flows through the states of Kerala and Tamil Nadu.
- Reservoirs and Dams: The Malampuzha Dam, built across the river, is the largest reservoir in Kerala, serving irrigation and hydroelectric purposes.

India Meteorological Department

Context:

The India Meteorological Department (IMD) celebrated its 150th Foundation Day. on January 14, 2025.

About India Meteorological Department (IMD):

- Established: 1875
- Ministry: Ministry of Earth Sciences
- Headquarters: New Delhi
- Aim: To provide accurate weather forecasting, climate monitoring, and disaster management services for the safety, economic stability, and overall development of India.

Functions

- Weather Forecasting: Issuing alerts for cyclones, floods, droughts, and other extreme weather events.
- Climate Research: Monitoring climate change and its impacts on agriculture and water resources.
- Disaster Management: Providing early warnings to minimize loss of life and property.
- Support to Sectors: Assistance to agriculture, aviation, shipping, and public safety.
- Public Awareness: Educating citizens about climate and weather patterns.

History:

- Established after major disasters like the 1864 Calcutta cyclone and monsoon failures in 1866 and 1871.
- Unified meteorological services under one authority to support the Indian subcontinent's unique weather needs.

Major Initiatives:

- Mission Mausam (2025): Advanced technologies for a weather-ready and climate-smart India.

- IMD Vision-2047: A roadmap for resilience and climate change adaptation.
- Expansion of Doppler Weather Radar: From 15 radars in 2014 to 39 in 2023, improving coverage by 35%.
- Cyclone Prediction: Accurate forecasting of cyclones like Fani (2019), Amphan (2020), and Biparjoy (2023), saving thousands of lives.
- Make in India Initiatives: Indigenous RADAR (1958), collaboration with ISRO for satellites (1983), and dynamic composite risk atlas (2022).

Cuba

Context:

India has extended humanitarian assistance to Cuba in the wake of Hurricane Rafael, providing essential medicines like antibiotics, painkillers, ORS, and muscle relaxants.

About Cuba:

- Location: Cuba is located at the confluence of the Caribbean Sea, Gulf of Mexico, and Atlantic Ocean.

Neighbours:

- East: Hispaniola (Haiti/Dominican Republic).
- West: Yucatán Peninsula (Mexico).
- North: Florida (USA) and the Bahamas.
- South: Jamaica and Cayman Islands.
- Capital: Havana.

Geographical Features:

- Major Rivers: Cauto (longest river) and Toa.
- Minerals: Rich in nickel, cobalt, iron ore, copper, and petroleum.
- Climate: Tropical, seasonally humid with maritime influences.

Gulf of Mexico

Context:

Recently, US President-elect Donald Trump proposed renaming the Gulf of Mexico to the Gulf of America, sparking debates over the geopolitical and historical significance of such a name change.

About Gulf of Mexico:

- Location: A marginal sea of the Atlantic Ocean, bordered by the United States, Mexico, and Cuba.

Neighbouring Nations:

- North and Northwest: United States
- South and Southwest: Mexico
- Southeast: Cuba.

Rivers Draining into the Gulf:

- Mississippi River (largest contributor).
- Other rivers: Brazos, Rio Grande, and Mobile.

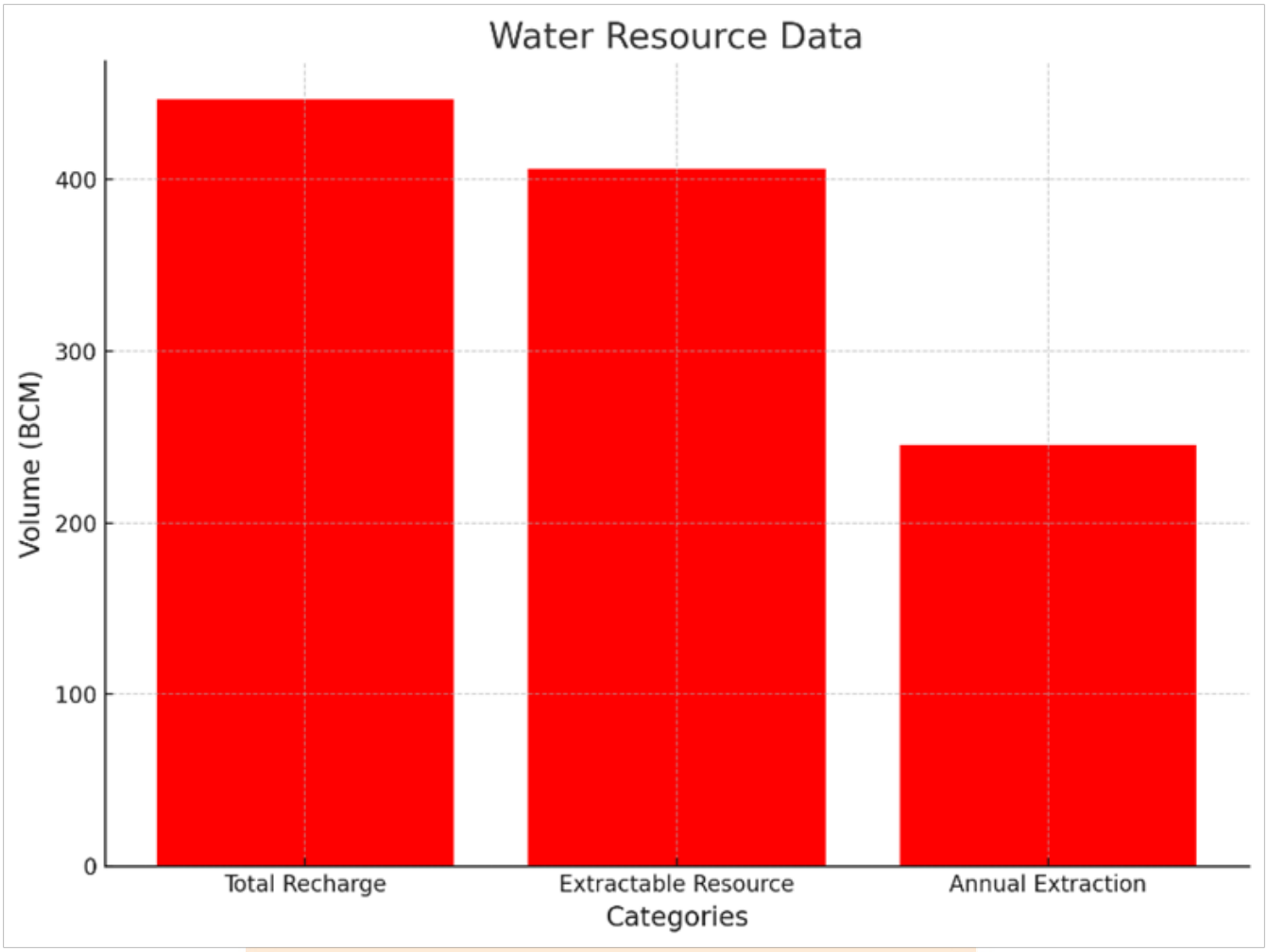
Geographical Features:

- Shape and Size: Oval-shaped basin, approximately 1.6 million km^2 in area.
- Floor Composition: Sedimentary rocks and recent sediments.
- Energy Resources: A major offshore petroleum production hub, contributing to 14% of US crude oil production.

Groundwater Conservation

Context:

Recent reports by the Central Ground Water Board (CGWB) highlight positive trends in groundwater recharge and reduced extraction, showcasing the potential of collaborative efforts and innovative policies.



- Improvements (2017–2024): (Source: National Compilation on Dynamic Ground Water Resources of India, 2024)
- Groundwater recharge increased by 15 BCM.
- Extraction decreased by 3 BCM.
- Safe assessment units increased from 62.6% (2017) to 73.4% (2024).
- Over-exploited units declined from 17.24% to 11.13%.
- Government Initiatives for Groundwater Conservation
- Jal Shakti Abhiyan: Focuses on rainwater harvesting and water conservation under the "Catch the Rain" campaign.
- Atal Bhujal Yojana (2020): Targets groundwater management in water-stressed regions across seven states.
- Mission Amrit Sarovar (2022): Plans to create/rejuvenate 75 Amrit Sarovars in each district for water harvesting.
- Pradhan Mantri Krishi Sinchai Yojana (PMKSY): Expands irrigation coverage and improves water-use efficiency.
- National Aquifer Mapping (NAQUIM): Covers 25 lakh sq. km, aiding in better planning for groundwater recharge.
- Master Plan for Artificial Recharge (2020): Proposes 42 crore rainwater harvesting structures to harness 185 BCM of rainfall.
- Watershed Development Component of PMKSY (WDC-PMKSY): Promotes soil conservation and rainwater harvesting.
- National Water Policy (2012): Advocates rainwater harvesting and efficient water use.

Challenges Facing Groundwater:

- Over-extraction: Excessive use of groundwater for irrigation and domestic needs is depleting reserves faster than they can recharge.
- Pollution: Groundwater is increasingly contaminated by arsenic, fluoride, nitrates, and industrial pollutants, impacting health and agriculture.

- Declining Water Tables: Unsustainable practices in urban and rural areas are causing groundwater levels to drop alarmingly.
- Climate Change: Shifting rainfall patterns are disrupting groundwater recharge cycles, exacerbating water scarcity.
- Urbanization: Expansion of cities reduces recharge zones and limits infiltration, worsening groundwater depletion.

Way Ahead:

- Policy Interventions: Enforce sustainable groundwater use laws and introduce incentives for adopting conservation techniques.
- Technology Integration: Leverage AI and IoT for real-time groundwater monitoring and optimized water resource management.
- Community Engagement: Foster awareness campaigns and involve local communities in groundwater conservation initiatives.
- Integrated Water Management: Encourage the use of surface and rainwater to complement groundwater and reduce dependence.

Conclusion:

India's significant progress in groundwater recharge and conservation underscores the importance of collaborative efforts. By continuing sustainable practices, technological innovations, and community participation, India can secure its water future and lead the way in global water management.

Olive Ridley Turtles

Context:

Over the past two weeks, numerous dead olive ridley turtles have washed ashore in Tamil Nadu, particularly in Chennai.

About Olive Ridley Turtles:

- What it is: Olive ridley turtles (Lepidochelys olivacea) are one of the smallest and most abundant sea turtles, known for their synchronized mass nesting, called arribadas.
- Habitat: Found in tropical regions of the Pacific, Indian, and Atlantic Oceans, olive ridleys are both pelagic and coastal, frequenting nesting beaches in countries like India, Mexico, and Costa Rica.

Features:

- Named for their olive-green, heart-shaped shell.
- Omnivorous, feeding on crabs, jellyfish, and algae.
- Capable of diving up to 500 feet to forage on the ocean floor.
- Mating Season: Their nesting season varies by region. In India, it spans November to March, with mass nesting observed at beaches like Odisha's Gahirmatha and Rushikulya.

Protection Status:

- Schedule 1 of Wildlife Protection Act, 1972
- Appendix I of CITES

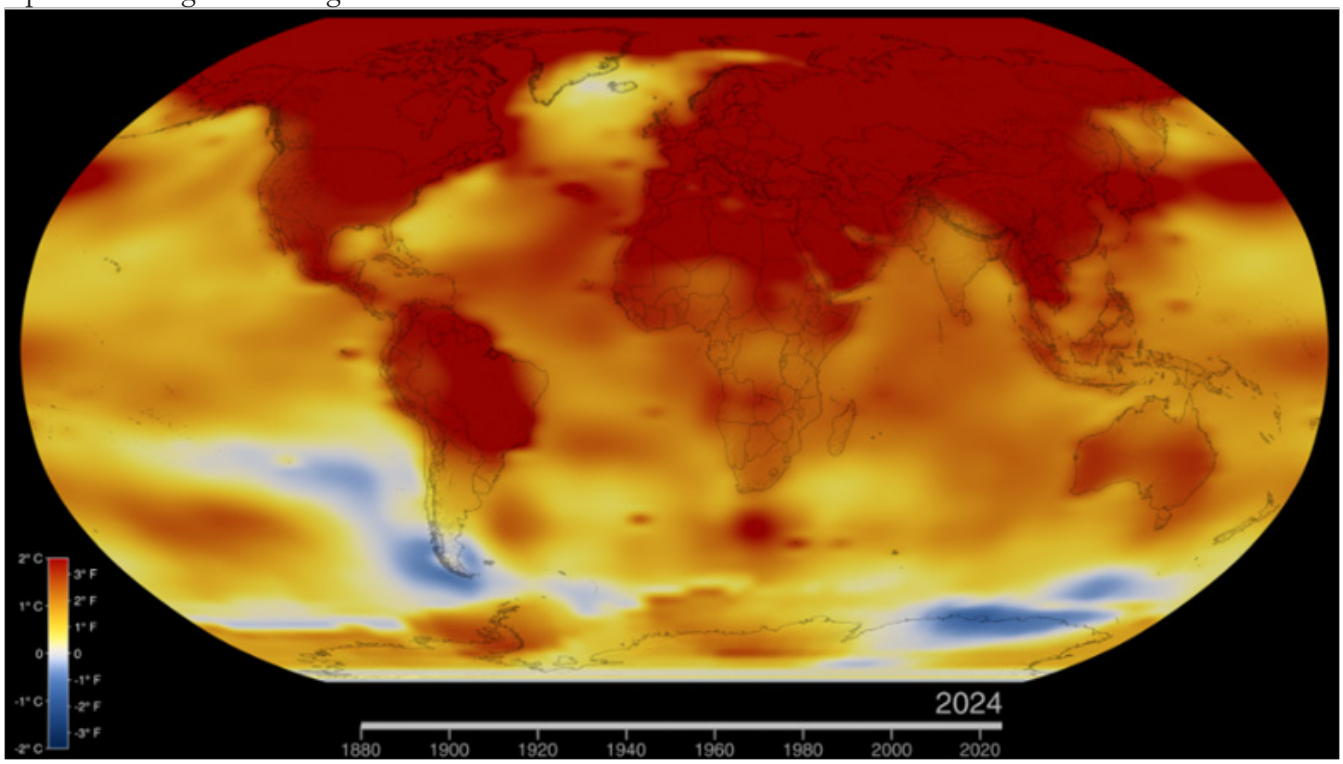
Recent Causes of Death:

- Bycatch in Fishing Nets: Olive ridley turtles get trapped in commercial trawler nets, suffocate due to lack of air, and die during their breeding season.
- Entanglement and Collisions: Discarded fishing gear and marine debris, along with vessel collisions near nesting grounds, cause severe injuries and fatalities.
- Environmental and Overfishing Impact: Overfishing near turtle congregation areas attracts more trawlers, increasing accidental deaths and habitat disturbances.

Global Warming and India

Context:

The year 2024 has been declared the warmest year on record globally, surpassing the critical 1.5°C threshold above pre-industrial levels. While India also recorded its warmest year, the extent of warming was relatively lower compared to the global average.



Global warming trends in 2024:

- Temperature Records: Global temperatures in 2024 were 1.28°C higher than NASA's baseline (1951–1980), breaking previous records.
- Warming Rates: The temperature rise over land exceeded 1.6°C, while oceans warmed by approximately 0.9°C.
- El Niño Impact: A strong El Niño phenomenon further contributed to the temperature surge.
- Decadal Warmth: The past decade has been the warmest in recorded history, with every year exceeding previous temperature averages.
- Regional Variations: The Arctic and high-altitude regions saw the highest temperature increases due to polar amplification and the albedo effect.

Factors leading to 2024 being the warmest year:

- Greenhouse Gas Emissions: Record-high CO_2 and methane emissions from fossil fuel use intensified global warming.
- El Niño Effect: A strong El Niño event amplified ocean temperatures, pushing global averages upward.
- Volcanic Eruption Impacts: The 2022 Tonga eruption likely altered atmospheric circulation, contributing to warming in subsequent years.
- Decreased Aerosol Pollution: Reduced pollution led to lesser cloud cover, allowing more solar radiation to be absorbed by the Earth.
- Loss of Arctic Ice: Accelerated melting in the Arctic reduced albedo, causing more heat absorption and increasing temperatures.

Why India experienced comparatively lower warming?

- Tropical Location: India's proximity to the equator results in less variability in warming compared to polar and temperate regions.
- Aerosols and Particulate Matter: High concentrations of aerosols scatter sunlight, leading to a cooling effect over India.
- Monsoon Dynamics: The Indian monsoon system helps regulate surface temperatures through seasonal rainfall.

- Ocean Influence: Surrounding oceans moderate India's temperatures, acting as heat sinks.
- Landmass Proportion: India's smaller landmass compared to global land surfaces results in less pronounced warming.

Challenges in controlling global warming:

- Rising Emissions: Despite global efforts, fossil fuel consumption and greenhouse gas emissions remain high.
- Economic Dependencies: Many nations, including India, are heavily reliant on coal and oil for energy.
- Global Inequity: Disparities in responsibilities and capacities hinder unified climate action.
- Insufficient Funding: Climate adaptation and mitigation efforts face financial constraints in developing nations.
- Climate Denial: Resistance from interest groups and misinformation campaigns slow progress on international agreements.

Solutions to control global warming:

- Renewable Energy Transition: Accelerate the adoption of solar, wind, and hydropower to reduce fossil fuel dependency.
- Afforestation: Large-scale tree-planting initiatives can act as carbon sinks and combat deforestation.
- Climate Policies: Strengthen international agreements like the Paris Accord to enforce emissions reductions.
- Technology Integration: Invest in carbon capture, storage, and other green technologies.
- Public Awareness: Educate communities about climate change to drive grassroots action and policy support.

Conclusion:

The record-breaking temperatures of 2024 underline the urgency of addressing climate change. While India's relative warming is lower, its vulnerabilities demand focused mitigation and adaptation efforts. Global cooperation, backed by robust policies and public participation, remains key to combating this existential crisis.

Indian Biennial Update Report

Context:

Recently, India submitted its Biennial Update Report (BUR-4), providing a detailed account of its greenhouse gas (GHG inventory), progress on targets, and measures to combat climate change.

What are Biennial Update Reports (BURs)?

BURs are reports submitted by developing countries to the UNFCCC, as per the obligations under the Paris Agreement. They include:

1. National GHG Inventory: Detailed emission sources, sinks, and trends.
2. Climate Action Plans: Updates on policies and programs to mitigate emissions.
3. Support Received: Financial, technical, and capacity-building assistance.
4. Socioeconomic and Forestry Data: Insights into national circumstances influencing emissions.

Highlights of India's BUR-4:

1. GHG Inventory for 2020:

- Total GHG emissions: 2,959 million tonnes of CO_2 equivalent.
- Net GHG emissions (after forestry absorption): 2,437 million tonnes of CO_2 equivalent.
- Emissions intensity of GDP reduced by 36% from 2005 levels.

2. Sectoral Contributions to Emissions:

- Energy: 75.66% (Electricity production alone: 39%).
- Agriculture: 13.72%.
- Industry and Waste: 10.62%.

3. Progress on Commitments:

- Emissions intensity reduction target of 45% by 2030 is on track.
- Non-fossil fuel-based power generation capacity: 46.52% as of 2024.

- Additional carbon sink creation: 2.29 billion tonnes CO2 equivalent (2005–2021).

4. Energy Efficiency Schemes:

- Perform, Achieve, and Trade (PAT): Saved 7.72 Mtoe and reduced 28.74 million tonnes of CO2 emissions.

5. Tech Needs for Growth:

- Highlighted needs for advanced technologies like ultra-efficient photovoltaics, floating wind turbines, and carbon capture for industrial sectors.

India's Climate Commitments and Status:

Commitment	Status
Reduce GDP emissions intensity by 45% by 2030	Achieved 36% reduction (2005–2020)
50% installed power capacity from non-fossil fuels	Achieved 46.52% (as of October 2024)
Create 2.5–3 billion tonnes CO2 sink by 2030	Created 2.29 billion tonnes (2005–2021)
Net-zero emissions by 2070	On track with incremental progress in renewable adoption and energy savings.

Challenges in achieving commitments:

- Technology Barriers: Limited access to advanced, low-carbon technologies due to high costs and intellectual property restrictions.
- Financial Constraints: Insufficient funding for large-scale renewable energy projects and carbon sink initiatives.
- High Dependency on Fossil Fuels: Transitioning sectors like transportation and industries remains a significant challenge.
- Agricultural Emissions: Methane from livestock and rice cultivation continues to be a persistent issue.
- Urbanization and Population Growth: Increasing energy demand and waste generation strain existing resources.

Way Ahead:

- Strengthen Technology Transfer: Facilitate affordable access to advanced climate technologies.
- Expand Renewable Energy: Accelerate investments in solar, wind, and other non-fossil energy resources.
- Enhance Forest Cover: Implement robust afforestation programs to meet carbon sink targets.
- Promote Circular Economy: Encourage sustainable practices across industries and waste management.
- Collaborate Globally: Seek international support for finance, technology, and capacity-building.

Conclusion:

India's BUR-4 underscores its progress toward climate goals, especially in reducing emissions intensity and transitioning to renewable energy. Despite challenges, a collaborative, technology-driven, and resource-efficient approach can help India achieve its commitments and inspire global climate action.

Environment Summits of 2024

Context:

In 2024, global environmental efforts faced a series of setbacks as key UN climate summits failed to deliver impactful resolutions.

2024 Climate Summits:

- Biodiversity (Colombia): Failed to finalize financing mechanisms for sustainable land-use practices, falling short of the $700 billion annual goal.
- Climate Change (Azerbaijan): Divisions over fossil fuel transition and inadequate funding pledges for developing nations.
- Land Degradation (Saudi Arabia): Lack of consensus on a legally binding drought protocol.
- Plastic Pollution (South Korea): No agreement due to opposition from nations reliant on plastic-based economies, favouring recycling over reduction.

Role of Youth in Environmental Pacts:

- Youth-led Litigation: Cases like Held v. Montana in the U.S. and Ridhima Pandey's petition in India showcase youth challenging inadequate climate policies.
- Advocating Human Rights: Emphasizing climate inaction as a violation of rights, demanding systemic, science-based reforms.
- Global Movements: Young activists highlight intergenerational equity, inspiring governments and communities to prioritize sustainable policies.
- Courtroom Success: Landmark rulings in Canada, the Netherlands, and Germany highlight the potential of youth advocacy to shape policies.

Reasons for Summit Failures:

- Divergent Priorities: Developing nations demand greater financial and technological support, while developed nations cite domestic constraints.
- Economic Pressures: Global crises like inflation, geopolitical conflicts, and post-pandemic recovery divert attention and resources.
- Lack of Consensus: Disagreements on accountability frameworks and operational mechanisms stalled progress.
- Inequitable Commitments: Wealthier nations failed to meet financial and emission reduction targets.

Road Ahead:

- Climate Finance: Wealthier nations must honour commitments to fund and support developing countries.

- Integrated Strategies: Address interlinked issues like biodiversity loss, land degradation, and pollution alongside climate action.
- Accountability Mechanisms: Robust frameworks to track commitments and enforce agreements.
- Youth Inclusion: Amplify youth voices in policymaking to ensure equity and innovation in solutions.
- Focus on Implementation: Shift from pledges to actionable and measurable outcomes.

Conclusion:

The failures of 2024 highlight the need for urgent, unified global action on environmental issues. Empowering youth, ensuring equitable financial commitments, and prioritizing collaborative strategies can pave the way for meaningful progress.

Incineration

Context:

Spill-free trucks carrying 337 tonnes of chemical waste from the Bhopal gas tragedy are set to reach Pithampur, where the waste will be incinerated within three to nine months.

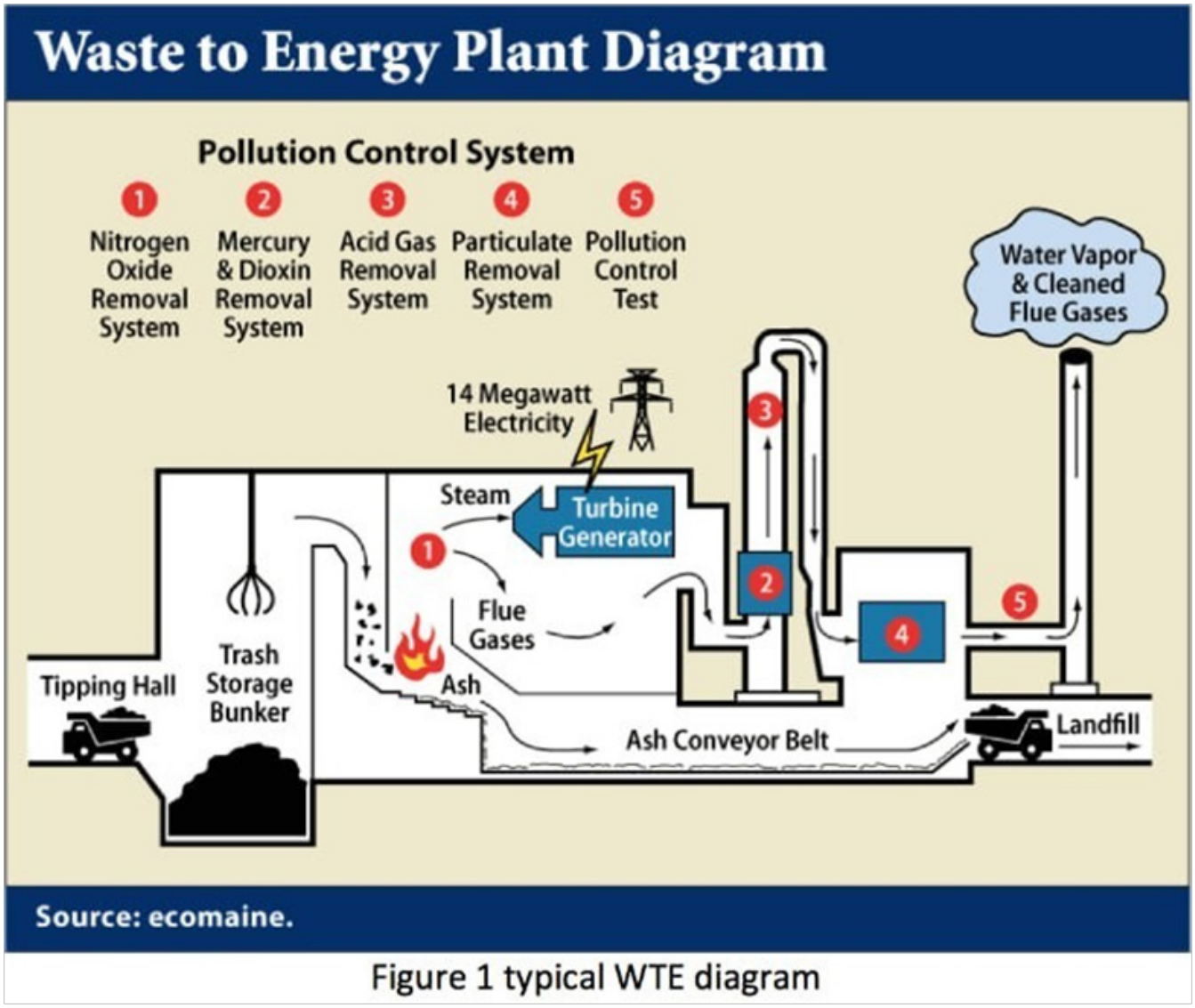


Figure 1 typical WTE diagram

About Incineration:

- What it is: Incineration is the controlled combustion of waste in high-temperature furnaces to reduce volume, neutralize hazardous materials, and recover energy.

Procedure:

- Combustion: Waste is burned at temperatures exceeding 850°C for complete destruction of toxins.
- Energy Recovery: Heat from combustion generates steam, which powers turbines for electricity production.
- Exhaust Gas Cleaning: Advanced systems like scrubbers and bag house filters remove harmful pollutants from emissions.

- Ash Residue Handling: Bottom ash is recycled or landfilled, while fly ash is treated with chemicals before disposal.

Advantages:

- Energy Generation: Produces electricity and heat from waste combustion.
- Space-Saving: Reduces landfill dependency in densely populated areas.
- Pollution Control: Modern systems ensure minimal environmental impact by capturing emissions.
- Resource Recovery: Produces materials like paving bricks and activated carbon.
- Safe Disposal: Effectively neutralizes hazardous materials.

Limitations:

- Harmful Emissions: Releases dioxins, furans, and other toxins if not properly maintained.
- Health Risks: Linked to respiratory issues and carcinogenic effects near poorly managed plants.
- Air and Water Pollution: Residual ash and flue gases can contaminate the environment.
- High Costs: Advanced incinerators require significant investment and maintenance.
- Inefficiency with Moisture: Wet waste in India reduces calorific efficiency.

Nitrate Contamination

Context:

Excess nitrate contamination in groundwater poses a serious health hazard, particularly in India, where over 440 districts report unsafe nitrate levels as of 2023.

About Nitrate:

- What it is: A naturally occurring nitrogen compound essential for biological processes, but harmful in excess.

Sources:

- Natural Sources: Soil organic matter decomposition.
- Anthropogenic Sources: Overuse of synthetic nitrogen fertilizers, improper sewage disposal, and livestock waste.

Causes of Nitrate Contamination:

- Agriculture: Leaching of fertilizers into groundwater.
- Poor Waste Management: Improper disposal of human and animal waste.
- Industrial Effluents: Discharge of untreated nitrogen-rich wastewater.
- Impacts of Nitrate Contamination:

Health Hazards:

1. Causes methemoglobinemia (blue baby syndrome) in infants.
2. Linked to cancer, reproductive issues, and endocrine disorders.
   - Environmental Toxicity:

1. Disrupts aquatic ecosystems through eutrophication.
2. Contributes to soil degradation and water toxicity.
   - State-Wise Contamination: Rajasthan (49%), Karnataka (48%), Tamil Nadu (37%).

Salmonella Outbreaks

Context:

A study from the University of Surrey highlights the link between weather conditions and increased Salmonella outbreaks, emphasizing the role of climate change in the spread of infectious diseases.

About Salmonella:

What is Salmonella?

- Salmonella is a type of bacteria that causes foodborne illnesses, commonly referred to as salmonellosis.
- Species:The two main species are Salmonella enterica and Salmonella bongori.
- Sources:Contaminated food, especially raw or undercooked poultry, eggs, meat, and dairy products.

Causes of Infection:

- Consumption of Contaminated Food: Eating raw or undercooked animal products.
- Poor Hygiene: Inadequate handwashing after handling raw food or animals.
- Cross-Contamination: Using the same utensils or surfaces for raw and cooked foods.
- Environmental Factors: Warm and humid weather conditions, as highlighted in the University of Surrey study, can increase Salmonella spread.

Symptoms:

- Common Symptoms: Diarrhea, fever, stomach cramps, nausea, vomiting, and headache.
- Severe Cases: Can lead to dehydration, bacteremia (bacteria in the bloodstream), and reactive arthritis.

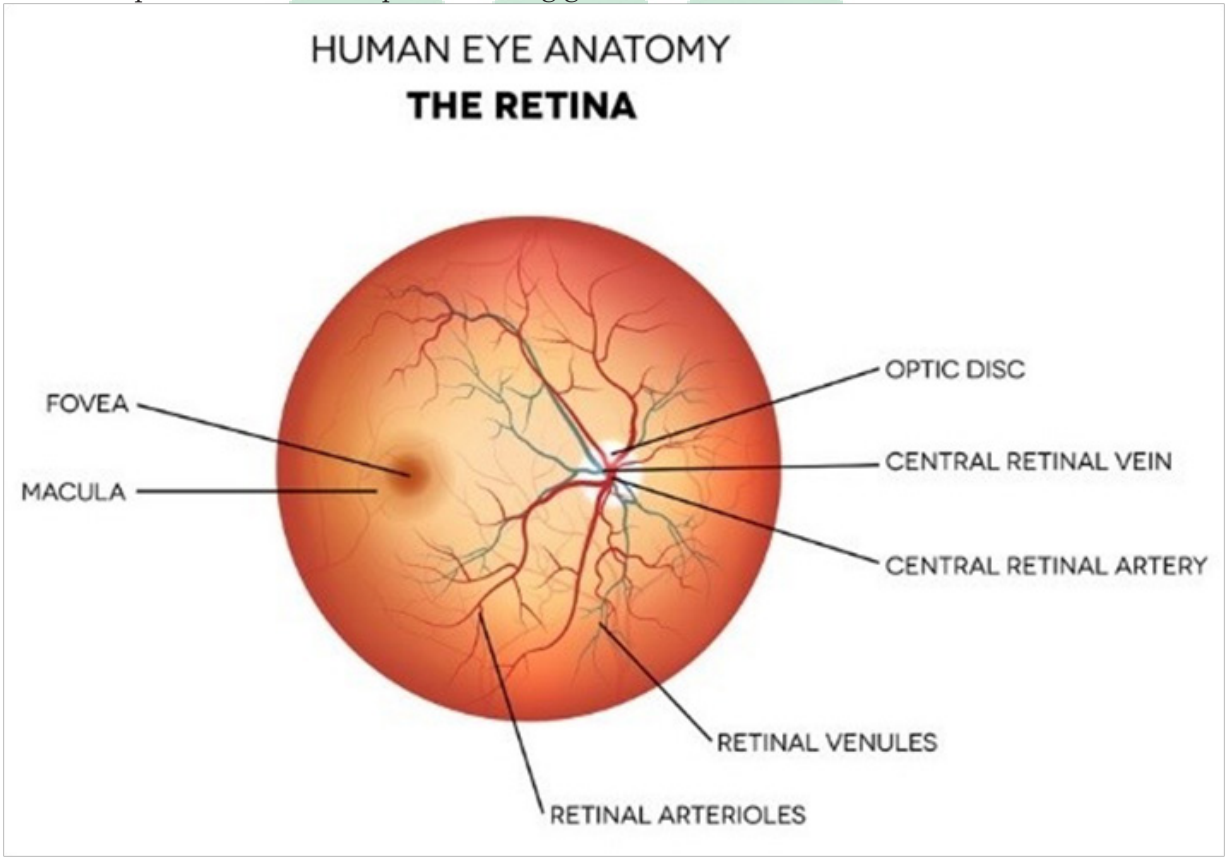
Treatment:

- Hydration: Drinking plenty of fluids to prevent dehydration.
- Antibiotics: Used in severe cases or for high-risk individuals (e.g., infants, elderly, or immunocompromised patients).

Retinal Diseases

Context:

Retinal diseases, particularly Inherited Retinal Diseases (IRDs), are gaining attention due to advancements in RNA-based therapeutics that offer hope for treating genetic causes of blindness.



About Retinal Diseases:

What are Retinal Diseases?

- Retinal diseases are disorders that affect the retina, the light-sensitive tissue at the back of the eye.
- These diseases can lead to progressive vision lossand, in severe cases, blindness. They can be caused by genetic mutations, aging, or other underlying health conditions.

Role of the Retina in Vision:

- The retina is responsible for converting light into neural signals, which are sent to the brain via the optic nerve.
- It contains specialized cells called photoreceptors (rods and cones) that detect light and colour, enabling us to see.
- Damage to the retina disrupts this process, leading to vision impairment or blindness.

Types of Retinal Diseases:

- Inherited Retinal Diseases (IRDs): Caused by genetic mutations in over 300 genes.
  Examples: Retinitis Pigmentosa, Leber Congenital Amaurosis, Stargardt Disease.
- Age-Related Macular Degeneration (AMD): Affects the central part of the retina (macula), leading to loss of central vision.
- Diabetic Retinopathy: Caused by damage to blood vessels in the retina due to diabetes.
- Retinal Detachment: Occurs when the retina pulls away from its normal position.
- Retinoblastoma: A rare cancer of the retina, primarily affecting children.

RNA-based therapeutics can cure retinal diseases:

What is RNA Therapy?

- RNA-based therapies involve using ribonucleic acid (RNA)to correct genetic defects or modulate gene expression. Unlike DNA-based therapies, RNA therapies are temporary and do not alter the patient's genome, reducing the risk of long-term side effects.

Types of RNA Therapies for Retinal Diseases:

Antisense Oligonucleotides (ASOs):

- Small RNA molecules that bind to specific RNA sequences to correct genetic errors.
- Used to treat conditions like spinal muscular atrophy and being explored for Stargardt Disease and Retinitis Pigmentosa.

RNA Editing with ADAR Enzymes:

- Corrects specific mutations at the RNA level without altering DNA.
- Promising for treating IRDs caused by single-point mutations.

Suppressor tRNAs:

- Bypass stop-codon mutations that prematurely halt protein synthesis, restoring full-length protein production in retinal cells.
- Small Molecule RNA Therapies (e.g., PTC124/Ataluren):
- Used to treat cystic fibrosis and Duchenne muscular dystrophy, now being tested for rare eye diseases like aniridia.

Advantages of RNA Therapies:

- Precision: Targets specific genetic mutations.
- Safety: Temporary changes reduce the risk of unintended effects.
- Versatility: Can address a wide range of genetic defects.

Nuclear Fusion

Context:

China's Experimental Advanced Superconducting Tokamak (EAST) reactor set a new milestone by sustaining a plasma state for over 1,000 seconds (17 minutes).

About Nuclear Fusion:

What is Nuclear Fusion?

- Nuclear fusion is a process where two light atomic nuclei combine to form a heavier nucleus, releasing immense energy—the same process that powers the Sun and other stars.

How it works?

- High Temperature & Plasma Formation: Fusion requires temperatures above 100 million degrees Celsius, creating a plasma state where atoms split into charged particles.
- Magnetic Confinement: Plasma is confined using strong magnetic fields to prevent contact with reactor walls.
- Fusion Reaction: Hydrogen isotopes (Deuterium & Tritium) fuse, producing helium and energy in the form of heat.

- Energy Capture & Conversion: Future reactors aim to use this heat to generate steam, driving turbines to produce electricity.

Major Nuclear Fusion Experiments Worldwide:

- China's EAST Reactor (Experimental Advanced Superconducting Tokamak):
- Achievement: Sustained plasma for 1,000+ seconds, surpassing its 2023 record of 400+ seconds.
- Significance: A critical step toward building a full-scale fusion power plant.
- Location: Institute of Plasma Physics, Anhui Province, China.

ITER (International Thermonuclear Experimental Reactor, France):

What is ITER?

- The world's largest fusion experiment, involving 35 nations, including India, the US, China, and the EU.
- Location: Southern France.

Key Features:

- 500 MW fusion power output planned by 2039.
- Uses Deuterium-Tritium fuel to replicate Sun-like conditions.
- Paves the way for commercial fusion power plants.

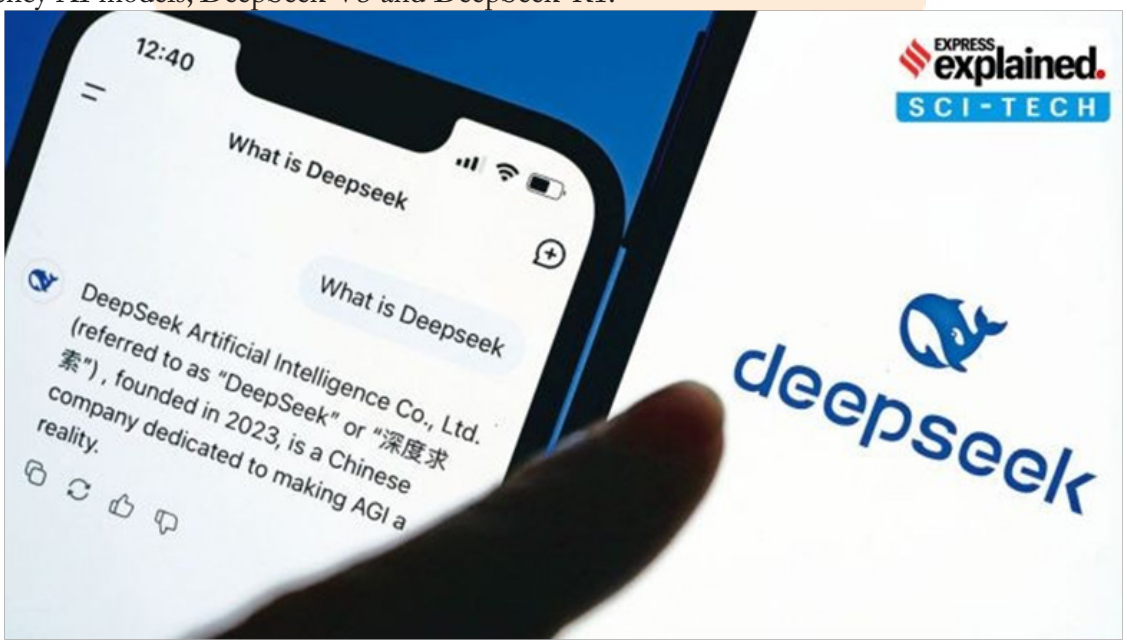
Difference between Nuclear Fusion and Nuclear Fission:

Aspect	Nuclear Fusion	Nuclear Fission
Process	Combines atomic nuclei	Splits heavy atomic nuclei
Fuel Used	Hydrogen isotopes (Deuterium & Tritium)	Uranium-235 or Plutonium-239
Energy Output	Extremely high (1g of fuel = 8 tonnes of coal)	High but lower than fusion
Nuclear Waste	Minimal, no long-term radioactive waste	Produces hazardous radioactive waste
Safety	No risk of meltdown, self-regulating process	Risk of reactor meltdowns (e.g., Chernobyl, Fukushima)

AI Revolution

Context:

DeepSeek, a Chinese AI startup, has gained global attention by challenging U.S. AI dominance with its low-cost, high-efficiency AI models, DeepSeek-V3 and DeepSeek-R1.



AI Works: The Fundamentals

1. Data Processing & Learning: AI models process large datasets to detect patterns and relationships, mimicking human cognition.

E.g., AI in Google Search analyzes user behavior to improve results.

1. Neural Networks & Deep Learning: AI uses multi-layered neural networks to learn complex patterns, improving over time.

   E.g., ChatGPT learns from vast internet text to generate human-like responses.

1. Machine Learning Algorithms: AI models rely on supervised, unsupervised, and reinforcement learning to enhance accuracy.

   E.g., Tesla's Autopilot refines driving decisions using ML.

1. Natural Language Processing (NLP): AI understands and processes human language, enabling chatbots and translation tools.

   E.g., OpenAI's ChatGPT and DeepSeek-V3 enhance real-time language translation.

1. Edge Computing & AI Optimization: AI is shifting towards edge computing for faster processing, reducing cloud dependency.

   E.g., Apple's Siri processes some voice commands locally on iPhones.

Some types of AI models:

1. Large Language Models (LLMs): AI models like DeepSeek-V3, GPT-4o, and Claude 3.5 excel in text generation, answering queries, and automating tasks.
2. Generative AI: AI models create images, videos, and text, revolutionizing content creation.

   E.g., MidJourney generates realistic AI-generated artwork.

1. Autonomous Systems: AI powers self-driving cars, drones, and robots for automation.

   E.g., Tesla's Full Self-Driving (FSD) improves vehicle autonomy.

AI is Revolutionizing Key Sectors:

Agriculture

- Precision Farming: AI-driven drones and sensors optimize irrigation, reducing water waste.

  E.g., IBM's Watson predicts crop diseases using satellite data.
- Automated Harvesting: AI-powered robotic arms pick fruits and vegetables, improving efficiency.

  E.g., John Deere's AI-driven tractors optimize field operations.

Healthcare & Education

- AI Diagnostics: AI detects diseases like cancer and COVID-19 with higher accuracy than humans.

  E.g., Google's DeepMind diagnoses eye diseases with 94% accuracy.
- Smart Education: AI personalizes learning experiences for students.

  E.g., Byju's AI-based learning adapts to students' needs.

Defense & Security

- AI-Powered Warfare: AI enhances autonomous drones, cyber warfare, and battlefield strategy.

  E.g., Russia uses AI-driven military drones in Ukraine.
- Threat Detection & Surveillance: AI identifies potential threats in real-time.

  E.g., India's AI-driven border surveillance improves national security.

Economy & Finance

- Stock Market Predictions: AI analyzes financial trends for high-frequency trading.

  E.g., Goldman Sachs uses AI for risk assessment.
- Fraud Detection: AI secures transactions by identifying anomalies in banking.

  E.g., Mastercard's AI prevents credit card fraud in real-time.

Governance & Public Services

- Smart Cities: AI manages traffic, waste, and energy consumption in urban areas.

  E.g., Singapore's AI-driven smart traffic system reduces congestion.
- AI in Policy Making: AI assists governments in formulating data-driven policies.

  E.g., Estonia's AI system drafts legal documents for policymaking.

Challenges Due to AI Revolution:

1. Job Displacement: AI threatens traditional employment in manufacturing, finance, and customer service.
2. Ethical & Bias Issues: AI models inherit biases from training data, leading to discrimination.
3. Data Privacy & Cybersecurity Risks: AI-driven deepfakes and hacking raise security concerns.
4. Geopolitical AI Arms Race: Countries compete for AI supremacy, leading to tech cold wars.
5. Regulatory & Legal Challenges: AI laws struggle to keep up with rapid advancements.

India's Status in AI Development:

1. AI Research & Development: India has AI hubs in IITs, IISc, and NITI Aayog-led AI programs.
   E.g., Bhashini project promotes AI-driven Indian language translation.
1. Startup Ecosystem: India has over 4,500 AI startups, fostering innovation in healthcare, fintech, and governance.
   E.g., Reliance Jio's AI initiatives in telecom.
1. Government AI Policy: India's AI Mission focuses on data security and AI adoption in governance.
   E.g., AI-powered Gram Panchayats for rural development.
1. AI in Défense & Cybersecurity: India invests in AI-driven surveillance, UAVs, and cyber defence.
   E.g., DRDO developing AI-powered drones for border security.
1. Collaboration with Global AI Leaders: India partners with Google, Microsoft, and NVIDIA for AI advancements.
   E.g., India-U.S. AI partnership for quantum computing.

Way Ahead:

1. Strengthening AI Regulations: Develop ethical AI frameworks for privacy, security, and bias mitigation.
2. AI Skill Development: Upskilling workforce to adapt to AI-driven jobs in the new economy.
3. Boosting AI Infrastructure: Enhance cloud computing and GPU access for AI startups.
4. Public-Private AI Collaboration: Encourage joint AI research between academia and industry.
5. AI for Social Impact: Use AI for poverty reduction, healthcare access, and rural development.

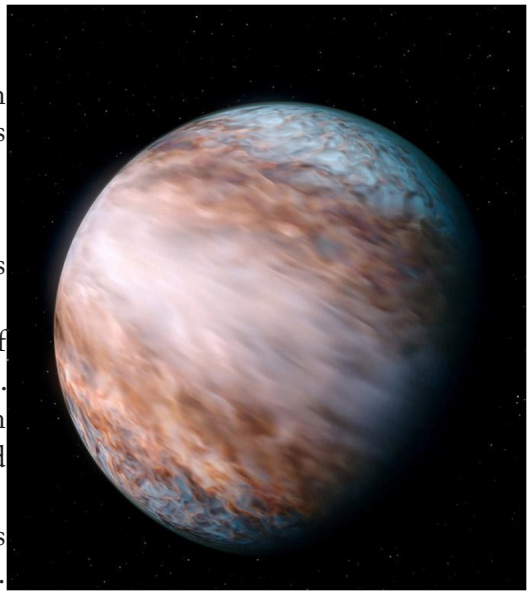
Conclusion:

DeepSeek's success challenges big tech's AI monopoly and raises geopolitical tensions in the AI race. While AI is revolutionizing industries, its ethical, legal, and security challenges require urgent policy intervention. For India, leveraging AI for economic growth and global leadership is the key to future technological dominance.

WASP-127b

Context:

Astronomers have observed jet-stream winds reaching 33,000 km/h on the exoplanet WASP-127b, making them the fastest planetary winds ever recorded.



About WASP-127b:

- Exoplanet Type: WASP-127b is classified as a hot Jupiter, a gas giant orbiting extremely close to its host star.
- Size & Mass: It is 30% larger than Jupiter but has only 16% of Jupiter's mass, making it one of the puffiest planets ever observed.
- Atmosphere & Composition: Composed mainly of hydrogen and helium, its atmosphere also contains carbon monoxide and water, making it a valuable subject for atmospheric studies.
- Supersonic Winds: The planet has equatorial jet-stream winds moving at 33,000 km/h, the fastest ever detected on any planet.
- Tidal Locking: Like the Moon-Earth system, one side always faces its star, creating extreme day-night temperature contrasts.

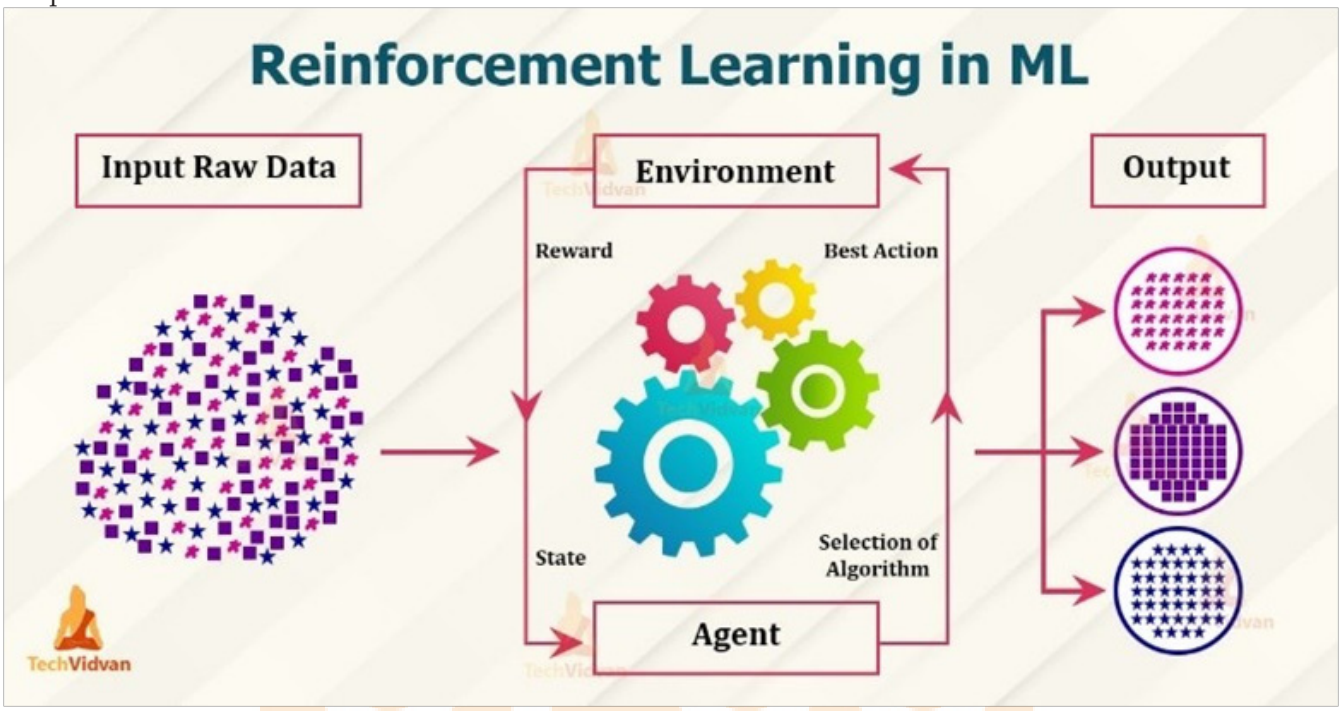
Significance:

- Atmospheric Dynamics: The study of WASP-127b helps understand exoplanet wind circulation and extreme weather conditions.
- Exoplanet Classification: It provides insights into the formation and structure of hot Jupiter's.
- Future Space Exploration: Understanding such atmospheric conditions aids in modelling planetary climates in distant solar systems.

Reinforcement Learning Model

Context:

DeepSeek, a Chinese AI start-up, has gained global attention for its innovative reinforcement learning model, R1, which demonstrates advanced reasoning capabilities at a fraction of the cost of similar models from U.S. companies like OpenAI.



About Reinforcement Learning Model in AI:

- What it is: Reinforcement Learning (RL) is a type of machine learning where an AI model learns to make decisions by interacting with an environment and receiving feedback in the form of rewards or penalties. The goal is to maximize cumulative rewards over time.

How it works:

- The AI model, or "agent," takes actions in an environment.
- Based on these actions, it receives feedback (rewards or penalties).
- The model adjusts its strategy to maximize rewards, improving its decision-making over time.
- DeepSeek's R1 model uses RL to automate the "reinforcement learning from human feedback" (RLHF) process, reducing the need for extensive human intervention.

How it is superior to existing AI models:

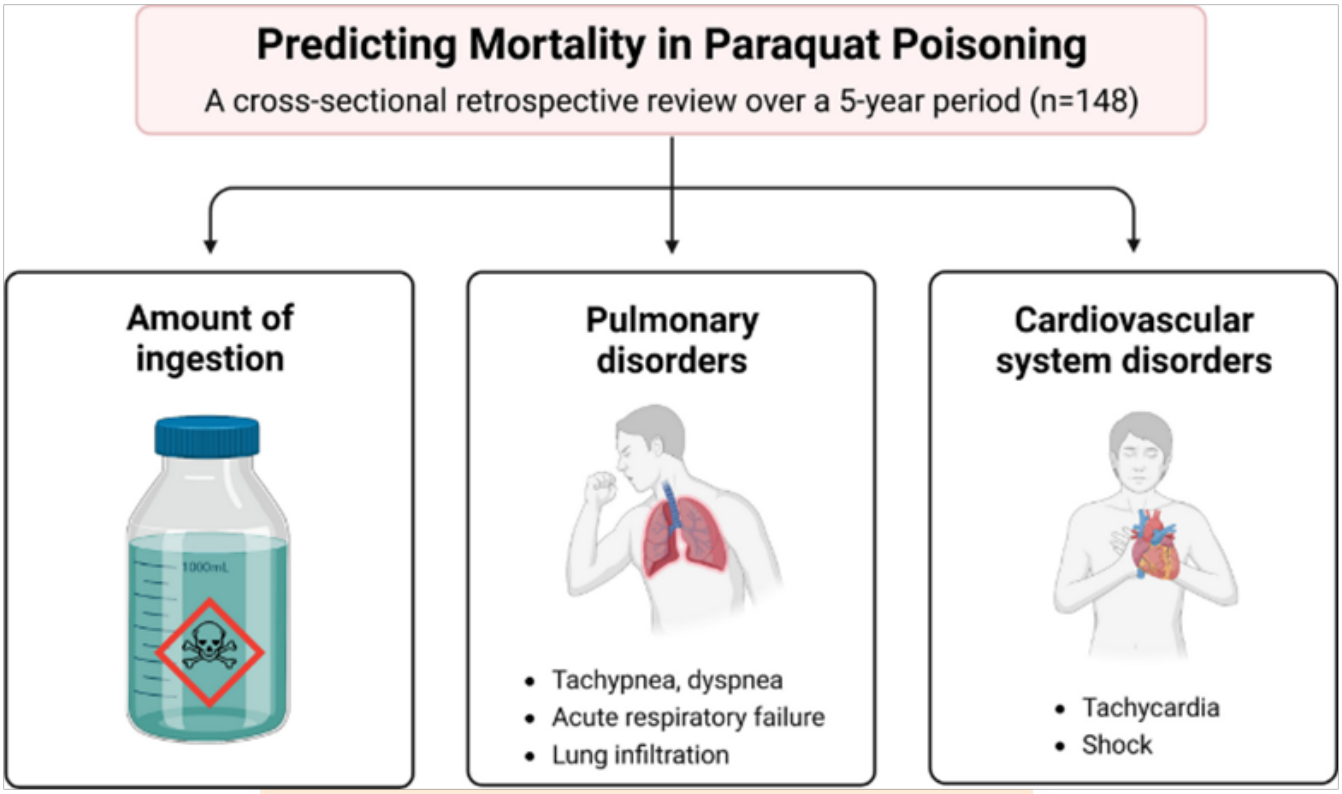
- Cost-Effectiveness: DeepSeek's R1 model achieves advanced reasoning capabilities at a significantly lower cost compared to models like OpenAI's o1.
- Autonomy: By automating the RLHF process, DeepSeek reduces reliance on human annotators, making the training process faster and more scalable.
- Efficiency: The model can "rethink" its approach to problems, leading to more accurate and adaptive responses.
- Scalability: DeepSeek's techniques allow for the creation of smaller, efficient models that can run on devices like smartphones, making AI more accessible.

Paraquat Poisoning

Context:

Paraquat poisoning recently gained attention following a high-profile murder case in Kerala, where the chemical was used to commit a crime.

- Paraquat, a widely used herbicide, is highly toxic and banned in over 70 countries due to its lethal nature.



About Paraquat Poisoning:

What is Paraquat Poisoning?

- Paraquat poisoning occurs when the toxic chemical paraquat, commonly used as a herbicide, enters the human body. It is extremely lethal even in small amounts and is classified as a Category 2 (moderately hazardous) chemical by the WHO.

How Does Paraquat Poisoning Occur?

- Ingestion: Accidental or intentional swallowing of paraquat is the most common route.
- Skin Contact: Prolonged exposure to liquid paraquat can lead to absorption and toxicity.
- Inhalation: Breathing paraquat fumes can cause respiratory damage.

Symptoms of Paraquat Poisoning:

- Initial Symptoms: Abdominal pain, swelling, mouth and throat irritation, nausea, and bloody diarrhea.
- Severe Symptoms: Acute kidney failure, liver damage, rapid heart rate, seizures, and respiratory failure. Symptoms can worsen based on the quantity ingested or exposure duration.

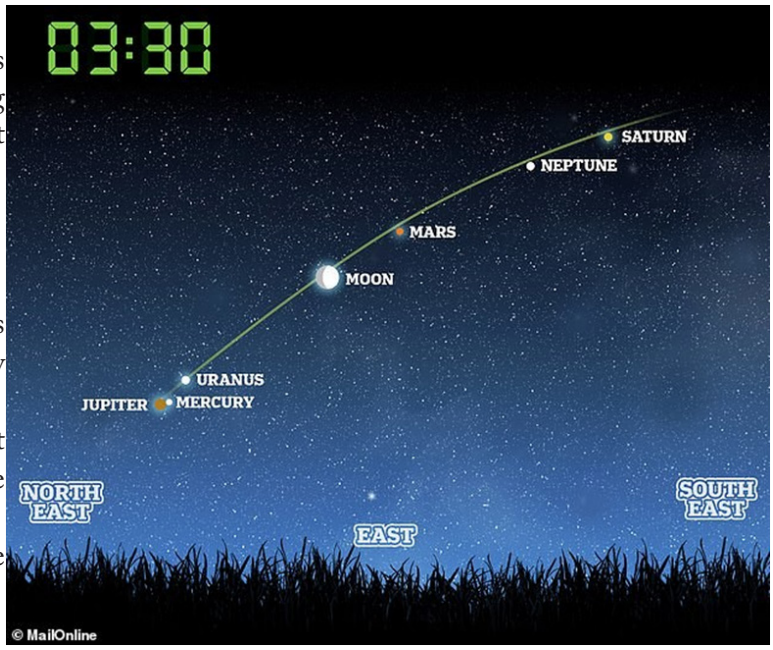
Treatment for Paraquat Poisoning:

- Immediate Actions: Activated charcoal or Fuller's earth (multani mitti) can be administered to reduce absorption.
- Medical Treatment: Hospital care is essential, with options like immunosuppression or charcoal hemoperfusion, though no antidote exists.
- Safety Measures: Contaminated clothing should be removed, and exposed skin should be washed thoroughly with soap and water.

Planet Parade

Context:

In January 2025, Venus, Saturn, Jupiter, and Mars have aligned spectacularly in the night sky, creating a rare celestial phenomenon known as a "planet parade."



About Planet Parade:

What is a Planet Parade?

- A planet parade occurs when several planets in the solar system are visible simultaneously in the night sky.
- It is not an official astronomical term but describes the alignment of planets along the plane of the solar system.
- These alignments can occur in either the morning or evening sky.

How does a planet parade occur?

- Planets orbit the Sun on approximately the same plane, known as the ecliptic plane, making them appear aligned in the sky.
- Due to their varying orbital speeds and distances, this alignment is temporary and visible only for specific periods.
- The current alignment features Venus, Saturn, Jupiter, Mars, Uranus, and Neptune, forming a curved arc across the sky.

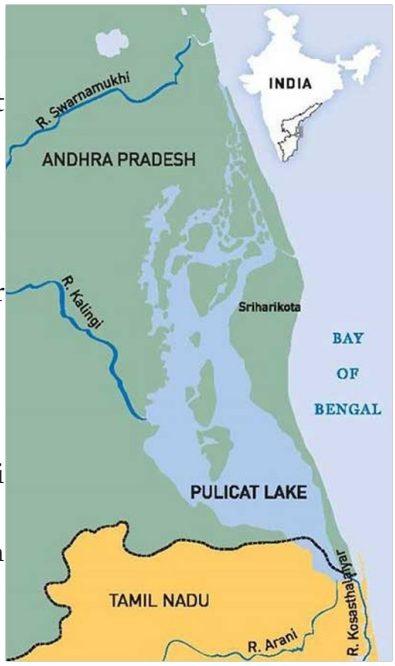
Significance of a Planet Parade:

- Astronomical Education: Encourages public interest in astronomy and celestial mechanics.
- Cultural Relevance: Historically interpreted as celestial omens or inspiration for folklore.
- Visibility of Planets: Provides a unique opportunity to view multiple planets, including distant ones like Uranus and Neptune.
- Scientific Exploration: Alignments offer researchers better opportunities to study planetary light emissions and trajectories.
- Public Engagement: Sparks curiosity, with astronomers using it as an outreach tool to promote space science.

Satish Dhawan Space Center

Context:

The Union Cabinet recently approved the establishment of a third launch pad at the Satish Dhawan Space Centre (SDSC) in Sriharikota, Andhra Pradesh



About Satish Dhawan Space Center Launchpad:

Established in:

- The Satish Dhawan Space Center (SDSC) became operational on October 9, 1971, with the launch of the sounding rocket 'Rohini-125.'
- It was initially known as the Sriharikota Range (SHAR).

Located in:

- Sriharikota is a barrier island off the Bay of Bengal, located in the Tirupati district of Andhra Pradesh, India.
- It separates Pulicat Lake from the Bay of Bengal, ensuring a safe flight path over the sea for rocket launches.

Reasons for Location Selection

- East Coast Advantage: Launching rockets eastwards takes advantage of Earth's rotation, adding velocity to the rocket and increasing payload capacity.
- Proximity to the Equator: Geostationary satellites require an equatorial plane. Being near the equator makes Sriharikota ideal for such launches.
- Largely Uninhabited Area: The site was sparsely populated, minimizing risks to human settlements during launches.
- Coastal Location: Proximity to the sea ensures rocket debris impacts occur over water, reducing constraints.

Renamed in:

- In 2002, the facility was renamed Satish Dhawan Space Centre (SDSC) in honor of Satish Dhawan, a pioneering rocket scientist and former ISRO chairman.

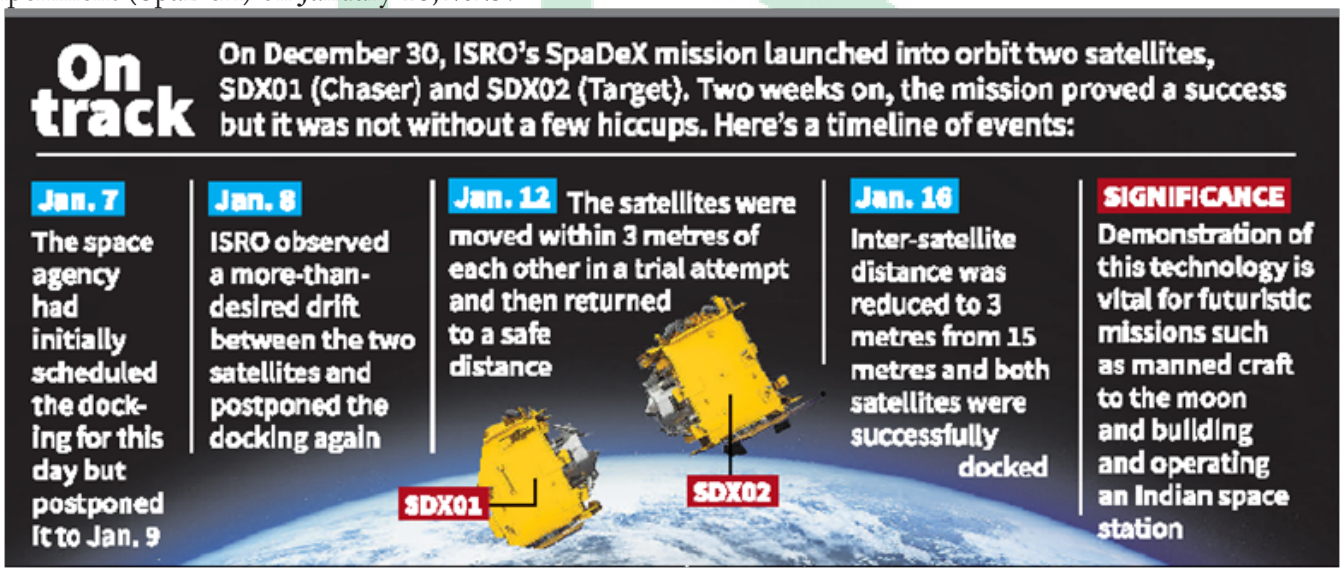
Historical Significance:

- Spearheaded by Vikram Sarabhai, the location was identified in 1968, with support from Abid Hussain and extensive surveys.
- Approximately 40,000 acres were acquired by October 1968 for the establishment of the site.
- SDSC has been pivotal in hosting key missions, including the PSLV, GSLV, Chandrayaan, and Mangalyaan.

Space Docking Experiment (SpaDeX)

Context:

India achieved a significant milestone in space technology with the successful execution of ISRO's Space Docking Experiment (SpaDeX) on January 16, 2025.



About ISRO's Space Docking Experiment (SpaDeX):

- What it is: SpaDeX is a mission to demonstrate satellite docking technology, a critical capability for advanced space missions like space station operations, interplanetary missions, and satellite servicing.
- Mission under: The experiment was part of ISRO's broader strategy to develop Next-Generation Space Technologies and was launched under the PSLV C60 mission.

Aim:

- Demonstrate docking and undocking of two satellites in orbit.
- Enable transfer of power and control between docked satellites.
- Support future human spaceflight missions, moon landings, and space station assembly.

Features:

- Satellites involved: SDX01 (Chaser) and SDX02 (Target), each weighing 220 kg.
- Rigidization post-docking for stability.
- Transfer of electric power between docked satellites to ensure operational readiness.
- Expected mission life: Two years.

How it is done:

- Satellites maneuvered from 15m to a 3m hold point for precision docking.
- Automated docking using sensors, alignment systems, and thrusters.
- Post-docking operations include power checks and payload activation.

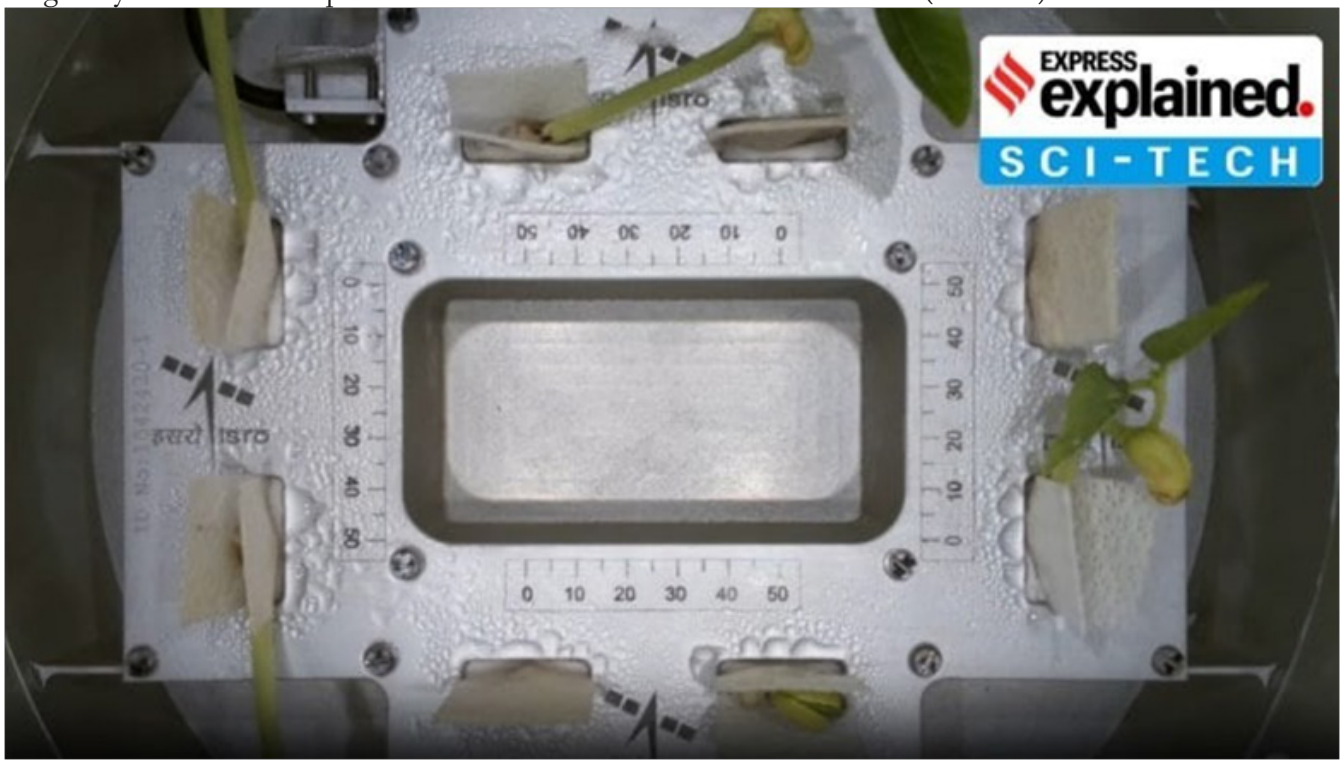
Nations that achieved the feat:

- United States: First achieved in the Gemini program in 1966.
- Russia: Demonstrated docking during the Soyuz missions.
- China: Successfully docked modules for the Tiangong space station.
- India: 4th nation to achieved this milestone in 2025 with SpaDeX.

Lobia Seeds Germination in Space

Context:

Recently, ISRO achieved a significant milestone by successfully germinating lobia (black-eyed pea) seeds in microgravity aboard its Compact Research Module for Orbital Plant Studies (CROPS).



About Lobia Seeds Germination in Space:

What it is:

- ISRO's experiment involved germinating lobia seeds aboard the CROPS module to study plant growth under microgravity conditions.
- The seeds sprouted successfully on the fourth day, with visible leaves by the fifth day, marking a milestone in India's space research.
- Mission name: Compact Research Module for Orbital Plant Studies (CROPS).
- Seed/Plant Used: Lobia (black-eyed pea), a nutrient-dense plant ideal for space farming experiments.

Aim:

- To develop sustainable food sources for long-term space missions.
- To test plant growth in conditions mimicking extraterrestrial environments, including microgravity and controlled atmospheric conditions.

Significance of Success:

Support for Space Missions:

- Enables astronauts to grow food, reducing dependency on pre-packaged supplies.

- Contributes to oxygen generation and CO_2 recycling aboard spacecraft.

Technological Advancements:

- Demonstrates India's capability to manage complex life-support systems in space.
- Provides insights into designing space habitats with integrated agriculture.
- Psychological Benefits: Tending to plants offers stress relief and improves mental health for astronauts.
- Global Contribution: Paves the way for India's collaboration in global space farming initiatives, such as those on the International Space Station (ISS).

Three Commissioned Ships

Context:

India celebrated a historic milestone as three frontline naval platforms INS Nilgiri, INS Surat, and INS Vaghsheer — were commissioned into the Indian Navy.

About Commissioned Ships:

Ship Name	Built By	Project Name	Features	Significance
INS Nilgiri	Mazagon Dock Shipbuilders Limited (MDL), Mumbai, and Garden Reach Shipbuilders and Engineers (GRSE), Kolkata	Project 17A (Nilgiri-class stealth frigates)	– Multi-mission stealth frigate for "blue water" operations	First of seven frigates under Project 17A, ensuring versatile capability in anti-air, anti-surface, and anti-submarine warfare

			– Equipped with supersonic surface-to-surface missiles, Medium Range Surface-to-Air Missiles (MRSAMs), and advanced close-in weapon systems	
INS Surat	Mazagon Dock Shipbuilders Limited (MDL), Mumbai	Project 15B (Visakhapatnam-class stealth guided missile destroyers)	– India's first AI-enabled warship	Fourth and final destroyer of Project 15B, enhancing India's offensive and defensive naval capabilities
			– Equipped with surface-to-air missiles, anti-ship missiles, and torpedoes	
			– Powered by a Combined Gas and Gas (COGAG) propulsion system, achieving speeds exceeding 30 knots	
			– Designed for "network-centric" warfare	
INS Vaghsheer	Mazagon Dock Shipbuilders Limited (MDL), Mumbai	Project 75 (Kalvari-class submarines)	– Diesel-electric attack submarine based on the French Scorpene-class design	Sixth and final submarine under Project 75, reinforcing India's underwater combat and intelligence-gathering capabilities
			– Equipped with wire-guided torpedoes, anti-ship missiles, and advanced sonar systems	
			– Features modular construction with future upgrade potential for Air Independent Propulsion (AIP) technology	

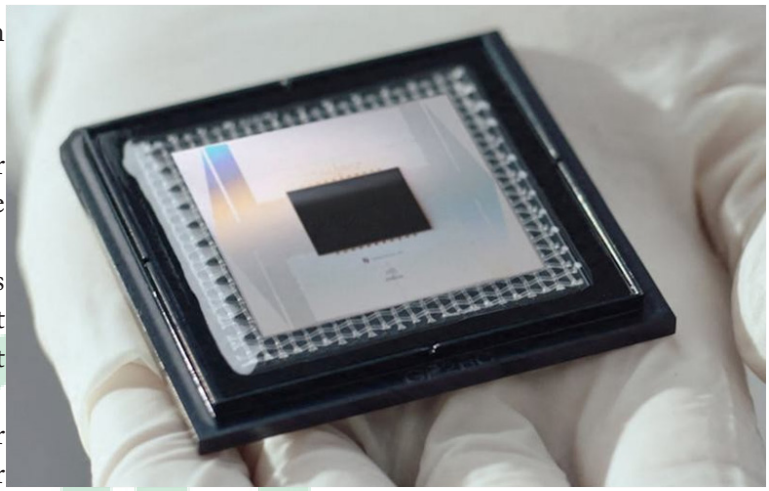
Commissioning together:

- Historic First: For the first time, a destroyer (INS Surat), a frigate (INS Nilgiri), and a submarine (INS Vaghsheer) were commissioned on the same day.
- "Made in India" Milestone: All three platforms were indigenously built, showcasing India's shipbuilding prowess and commitment to Atmanirbhar Bharat (self-reliant India).
- Strategic Impact: The additions bolster India's maritime defense, increase deterrence capabilities, and support its strategic influence in the Indian Ocean Region (IOR).

Google Willow Chip

Context:

Google recently unveiled its latest quantum processor, named 'Willow.'



About Willow Quantum AI:

- Willow is Google's latest quantum processor with 105 physical qubits designed to enhance quantum error correction and scalability.
- Error Correction Protocols: Employs surface code with data and measurement qubits to detect and mitigate errors without collapsing qubit states.
- Superconducting Qubits: Operates at near absolute zero temperatures (-273.15° C) for maximum stability.
- Improved Coherence Time: Achieves 100 microseconds of coherence time, allowing qubits to hold information longer during computations.
- Leakage Error Management: Includes additional measurement qubits to manage leakage errors effectively.

Significance of Willow:

- Computational Breakthrough: Successfully completed the Random Circuit Sampling (RCS) task in minutes a task that would take classical computers 10 septillion years.
- Error Reduction Below Threshold: Demonstrates a decline in error rates with an increase in qubits, a critical milestone for practical quantum computing.
- Applications in Complex Problems: Paves the way for solving challenges in drug discovery, climate modelling, materials science, and optimization problems.
- Foundation for Scalability: Addresses key hurdles, ensuring quantum computers can grow larger and remain reliable.
- Societal Impact: Potential to revolutionize industries and solve problems of global significance.

Green Banks

Context:

The Global South, including India, struggles to secure adequate climate finance despite COP29 commitments. Establishing a Green Bank in India offers a market-driven solution to support sustainable development and decarbonization.

What Are Green Banks?

Green Banks are mission-driven financial institutions designed to accelerate clean energy adoption and fight climate change. Unlike traditional banks, they focus on financing proven, environmentally friendly projects while ensuring capital recovery for reinvestment.

Need for a Green Bank in India:

- Affordable Credit for Green Projects: High-interest loans from commercial banks make green financing inaccessible, requiring affordable solutions.
- Localized Climate Finance: An Indian Green Bank can retain capital domestically, financing local decarbonization efforts.
- Achieving Net-Zero Goals: India's 2070 net-zero target demands robust mechanisms for mobilizing large-scale climate finance.
- Support for Vulnerable Communities: Green Banks can empower farmers and MSMEs to adopt eco-friendly practices through affordable credit.

How Green Banks Work:

- Capital Mobilization: Funds are sourced via government grants, environmental cesses, and issuing green bonds.
- Targeted Lending: Loans focus on viable clean energy projects with assured repayment potential.
- Market Development: Green Banks identify and finance opportunities to maximize environmental and economic returns.
- Circular Investment: Returned capital is reinvested into new green projects, creating a self-sustaining financing loop.

Limitations of Green Banks:

- Initial Capital Requirement: Establishing a Green Bank demands significant governmental and institutional funding.
- Limited Public Awareness: Lack of awareness among stakeholders can limit the adoption of green financing initiatives.
- Risk of Loan Defaults: Green projects carry financial risks, potentially impacting a Green Bank's sustainability.
- Policy and Regulatory Gaps: Absence of a clear regulatory framework can impede effective Green Bank operations.

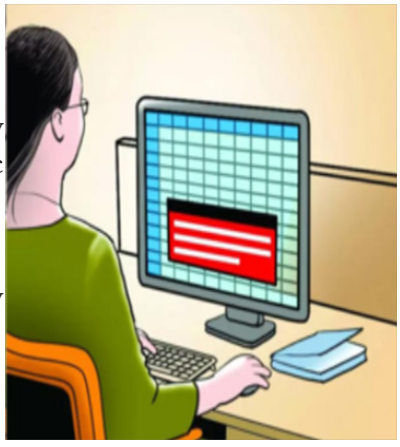
Way Ahead:

- Policy Framework: Develop robust guidelines and incentives to promote the efficient functioning of Green Banks.
- Public-Private Partnerships: Partner with private institutions to diversify resources and enhance capital mobilization.
- Awareness Campaigns: Launch targeted campaigns to educate stakeholders about the advantages of green financing.
- Focus on Innovation: Support R&D to broaden the scope of eligible clean energy projects for financing.

Conclusion:

India must take a leadership role in climate finance by establishing a Green Bank to support decarbonization. By addressing challenges and fostering innovation, the nation can achieve sustainable development and set an example for the Global South.

Open Data Kit Platform



Context:

The Comptroller and Auditor General of India (CAG) has introduced a revolutionary toolkit using the Open Data Kit (ODK) platform to ensure transparency in public spending and evaluate the effectiveness of government schemes.

About the CAG Toolkit:

- What it is: A digital platform based on Open Data Kit (ODK) technology for designing, collecting, and managing audit-related data.
- Launched by: Comptroller and Auditor General (CAG) of India.
- **Objectives:**

1. Enhance transparency in public spending.
2. Improve accountability in the delivery of government schemes.
3. Collect real-time beneficiary feedback for informed audit planning.

Key Features:

- Integrated with CAG's own Operating System (OIOS).
- End-to-end encryption for secure data management.
- Multi-language support for beneficiary surveys.
- User-friendly interface for designing and managing data collection processes.

How it works:

- Surveys are designed on the ODK platform and deployed to beneficiaries.
- Data is collected in real-time, analyzed using the OIOS system, and used as audit evidence.
- Beneficiary feedback helps identify problem areas and improve scheme delivery.

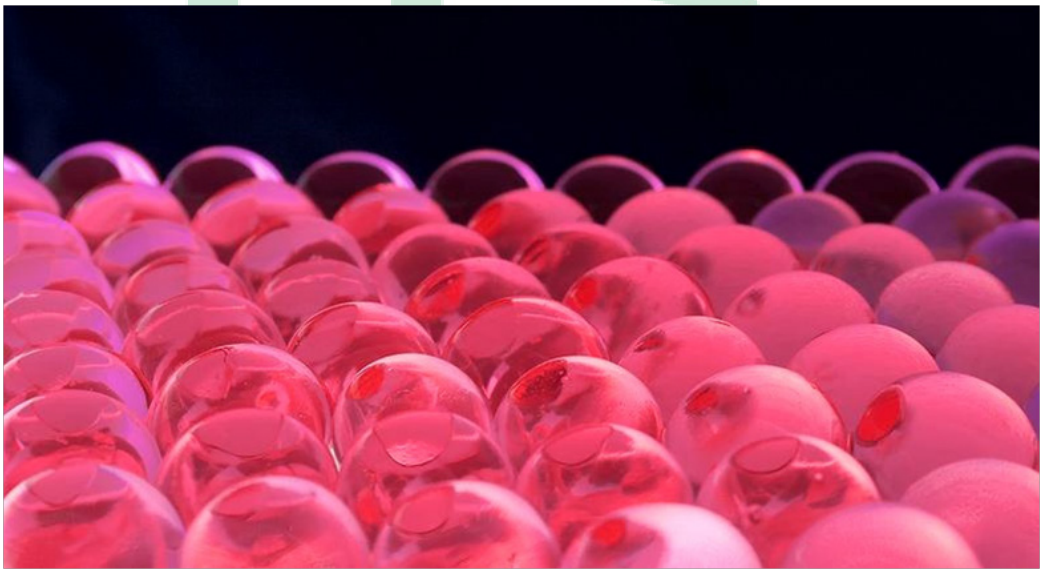
Significance:

- Enables data-driven decision-making in audits.
- Ensures citizen-centric evaluation of government schemes.
- Facilitates performance reviews of institutions like AIIMS, improving service delivery.

Injectable Hydrogel

Context:

Researchers from IIT-Guwahati and Bose Institute, Kolkata, have developed an advanced injectable hydrogel for localized cancer treatment.



About the Hydrogel:

- What it is: A water-based polymer network designed to release anti-cancer drugs precisely at the tumour site, sparing healthy cells.
- Developed by: Researchers from IIT-Guwahati and Bose Institute, Kolkata.

Features:

- Localised Drug Delivery: Precisely targets cancer cells without affecting healthy cells.
- Responsive Design: Reacts to elevated glutathione (GSH) levels abundant in tumour cells.
- Biocompatibility: Mimics living tissues for seamless integration with the biological environment.
- Stability: Remains insoluble in biological fluids, ensuring localization at the injection site.

Significance:

- Reduces harmful side effects associated with traditional chemotherapy.
- Enhances precision in cancer therapy, particularly for breast cancer.
- Represents a step forward in personalized and localized cancer treatments.

Payment and Settlement Systems Act, 2007

Context:

The Reserve Bank of India (RBI) has tightened norms for imposing monetary penalties and compounding offences under the Payment and Settlement Systems Act, 2007 (PSS Act).

About Payment and Settlement Systems Act, 2007 (PSS Act):

What is the PSS Act?

- The Payment and Settlement Systems Act, 2007 (PSS Act) is a legislation that regulates and supervises payment systems in India.
- It designates the Reserve Bank of India (RBI) as the authority responsible for overseeing payment systems and ensuring their smooth functioning.

Aim:

- To provide a legal framework for the regulation and supervision of payment systems in India.
- To ensure financial stability, efficiency, and consumer protection in payment systems.
- To establish netting and settlement finality as legally enforceable concepts.

Important Features:

- Authorization Requirement: No entity can operate a payment system without authorization from the RBI.
- Definitions: The Act defines key terms like payment system, payment obligation, payment instruction, and settlement.
- Regulatory Powers: The RBI can impose monetary penalties, compound offences, and take enforcement actions against violators.

- Board for Regulation and Supervision (BPSS): A committee of the RBI's Central Board that oversees payment systems.

RBI Powers Under the PSS Act:

- Authorization: The RBI grants or denies authorization to entities seeking to operate payment systems.
- Penalties: The RBI can impose penalties up to 10 lakh or twice the amount involved in contraventions, whichever is higher.
- Compounding of Offences: The RBI can compound offences (settle violations without court proceedings) for non-imprisonable offences.
- Inspection and Supervision: The RBI can inspect payment systems and take corrective actions to ensure compliance.

What Does the PSS Act Cover?

- Payment Systems: Includes systems enabling credit card operations, debit card operations, money transfers, and similar operations.
- Settlement Systems: Covers systems for clearing and settling funds, securities, foreign exchange, and derivatives.
- Financial Market Infrastructures (FMIs): Includes Central Counterparties (CCPs), Securities Settlement Systems (SSS), and Trade Repositories (TRs).
- Exemptions: The PSS Act does not apply to stock exchangesor clearing corporations established under stock exchanges (Section 34).

"When-Listed" Platform

Context:

SEBI plans to introduce a "when-listed" platform to regulate pre-listing share trading, aiming to curb grey market activities and protect investor interests.

About the 'When-Listed' Platform:

- What it is: A regulated platform for trading unlisted shares between IPO allotment and official listing.
- Developed by: Securities and Exchange Board of India (SEBI) in collaboration with stock exchanges.
- Aim: To reduce grey market trading, ensure transparency, and provide a regulated avenue for pre-listing share transactions.

Features:

- Allows trading of IPO-allotted shares before official listing.
- Operates within the T+3 timeline (allotment to listing).
- Replaces informal grey market trading with a formal, regulated mechanism.

Significance:

- Enhances market transparency and investor protection.
- Curbs volatility and speculative activities in the grey market.
- Formalizes pre-listing trading, reducing risks for retail investors.

What is the Grey Market?

- The grey market refers to the unofficial trading of securities, particularly shares, before they are officially listed on stock exchanges.
- It operates outside the regulatory framework, relying on demand and supply dynamics.
- Transactions are based on notional prices, and no physical delivery of shares occurs.

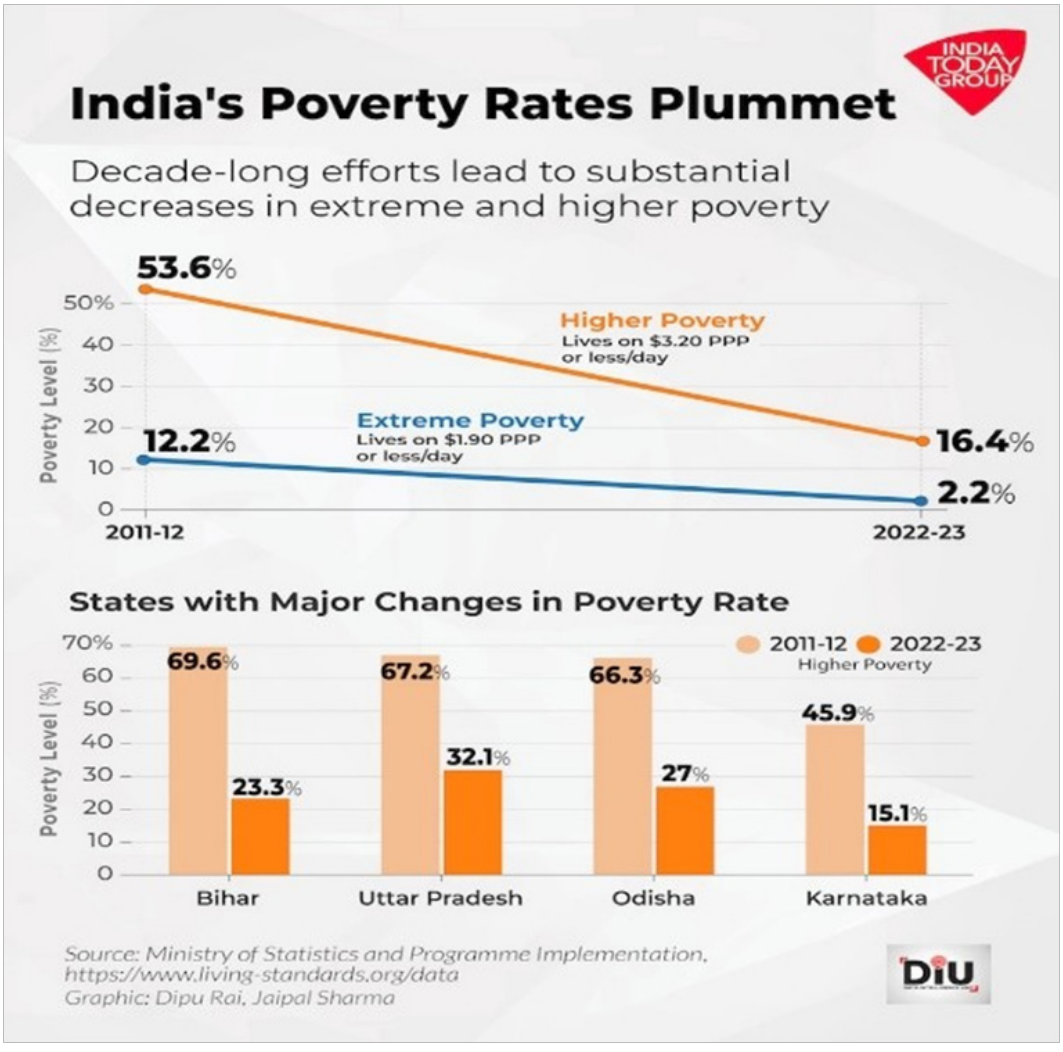
Existing Mechanism:

- Currently, SEBI mandates that shares must be listed on stock exchanges within three working days (T+3) after the IPO bidding process closes.
- Allotment of shares is completed on T+1, and trading begins on T+3.

Issue of Poverty Underestimation

Context:

The 2023-24 Household Consumption Expenditure Survey (HCES) revealed a decline in urban and rural poverty, amid ongoing debates on data comparability, availability, and defining an adequate consumption basket for the poverty line.



About Poverty Data in India:

1. HCES 2023-24: Reports rural poverty reduced to 7.2% and urban poverty to 4.6% compared to 25.7% and 13.7%, respectively, in 2011-12.
2. **Multidimensional Poverty Index (MPI):**
   - NITI Aayog (2022-23): Multidimensional poverty dropped to 11.28% from 29.17% in 2013-14.
   - Global MPI (2019-21): India halved its MPI value, with 135.5 million people escaping poverty.
3. World Bank Estimate: Using $2.15/day as a poverty line, extreme poverty was 11.9% in India in 2019.
4. Other Reports: The Rangarajan Committee (2014) pegged 2011-12 poverty at 29.5%, higher than the Tendulkar Committee's 21.9%.

Is Poverty Underestimated in India?

Yes, Poverty is Underestimated

- Dated Poverty Lines: The poverty line by Tendulkar (33/day urban, 27/day rural) and Rangarajan (47/day urban, 30/day rural) fails to reflect rising living costs.

  E.g. A nutritious diet is unaffordable for 74% of Indians (World Bank).
- Multidimensional Deprivations: While multidimensional indices highlight improved access to electricity and sanitation, income-based poverty persists.

  E.g. Informal sector workers lack financial security despite basic amenities.
- Data Gaps: Absence of Census 2021 limits accurate rural-urban poverty differentiation.

  E.g. Rural areas transitioning into peri-urban zones distort poverty statistics.
- Inconsistent Methodologies: Changing recall periods in surveys inflate consumption expenditure, lowering poverty estimates artificially.

  E.g. Shifts to MMRP (modified mixed reference period) reduce poverty estimates by boosting expenditure figures.
- Exclusion Errors in Welfare Schemes: Despite flagship programs, implementation gaps exclude the most vulnerable.

  E.g. Leakages in MGNREGA and Pradhan Mantri Awas Yojana.

No, Poverty is Not Underestimated:

- Substantial Poverty Reduction: Reports like NITI Aayog's MPI and HCES showcase consistent poverty decline over decades.

  E.g. Over 24.82 crore people escaped multidimensional poverty between 2013-14 and 2022-23.
- Improved Welfare Programs: Initiatives like PMJDY, SBM, and PMUY have improved living standards.

  E.g. Universal access to bank accounts (PMJDY) fosters financial inclusion.
- Decline in Calorie-Based Poverty: Diversified rural consumption indicates improved living conditions beyond subsistence.

  E.g. Rural spending on services increased, reflecting better quality of life.
- Global Comparisons Validate Progress: India's MPI and poverty reduction rates align with UN and World Bank assessments.

  E.g. UNDP's MPI highlights a halving of poverty since 2015-16.
- Economic Growth Contribution: High GDP growth and reduced inflation support poverty alleviation.

  E.g. Flagship programs like Poshan Abhiyan reduced malnutrition in vulnerable populations.

Way Ahead:

- Updated Poverty Metrics: Revisit poverty lines to incorporate rising living costs and regional disparities.
- Strengthen Data Collection: Conduct Census 2021 and ensure reliable consumption surveys.
- Focus on Income Poverty: Incorporate income vulnerability alongside multidimensional metrics.
- Improve Welfare Delivery: Enhance targeting and transparency in welfare programs.
- Promote Livelihoods: Foster rural employment through skill development and MSME support.

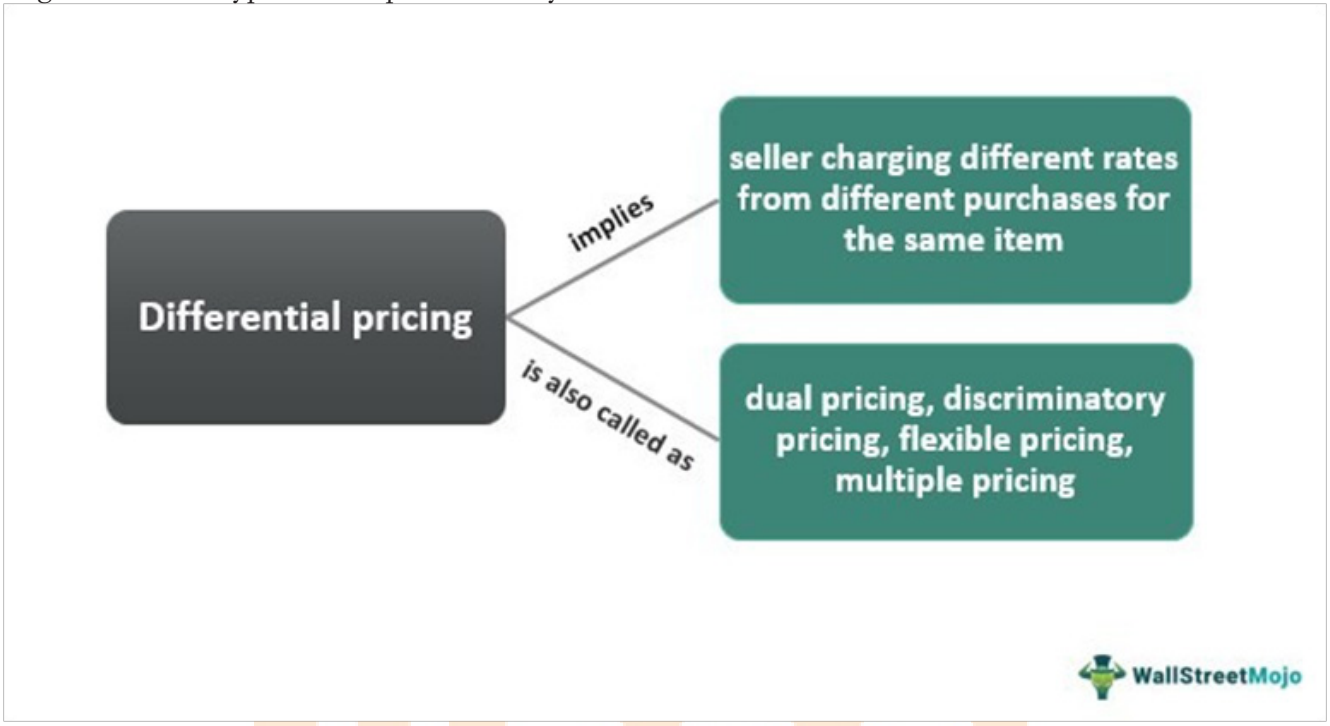
Conclusion:

India has made remarkable strides in poverty reduction, but the debate on underestimation highlights the need for updated methodologies and robust data systems. By addressing systemic gaps and prioritizing inclusive growth, India can ensure sustainable poverty eradication and equitable development.

Differential Pricing

Context:

The Central Consumer Protection Authority (CCPA) has issued notices to Ola and Uber over alleged differential pricing based on the type of smartphone used by consumers.



About Differential Pricing:

What Is Differential Pricing?

Differential Pricing is a strategy where businesses set varying prices for the same product or service based on factors like location, demand, customer demographics, or purchasing behavior. This dynamic approach allows businesses to optimize revenues while catering to different market segments.

Types of Differential Pricing:

- Price Localization: Adapting prices to reflect local purchasing power or competition.
- Real-Time Pricing: Adjusting prices based on demand, competition, and availability.
- Subscription-Based Pricing: Offering discounts for long-term commitments.
- Seasonal Discounts: Reducing prices during specific periods, like holidays.
- Volume Discounts: Incentivizing bulk purchases with lower per-unit costs.

Factors Leading to Differential Pricing:

- Consumer Demographics: Age, income level, and purchasing behavior influence pricing strategies.
- Geographic Location: Local competition and cost structures dictate regional pricing.
- Market Demand: High demand allows businesses to increase prices (e.g., festive seasons).
- Technology Integration: AI-driven dynamic pricing tailors costs to individual customers.
- Economic Conditions: Inflation, currency exchange rates, and tariffs impact pricing.

Why Companies Use Differential Pricing:

- Maximize Revenue: Tailored pricing helps capture maximum consumer willingness to pay.
  E.g. Airlines charging more for last-minute bookings.
- Boost Market Penetration: Lower initial prices attract customers in new markets.

E.g. Introductory offers for new product launches.

- Encourage Bulk Purchases: Volume-based pricing clears inventory faster.

  E.g. Discounts on combo deals.
- Increase Profit Margins: Higher prices during peak demand maximize profitability.

  E.g. Hotel rates during major events.
- Compete Locally: Adjusting prices to match local purchasing power.

  E.g. Mobile apps offering region-specific pricing.

Rupee Depreciation

Context:

The Indian rupee recently experienced a sharp decline in value against the US dollar after a period of relative stability.

What is Devaluation?

Devaluation refers to the deliberate downward adjustment of a country's currency value against foreign currencies, typically carried out by the central bank. It is used to enhance export competitiveness and reduce trade deficits but may increase the cost of imports and domestic inflation.

What is Depreciation of Rupee?

Depreciation of the rupee occurs when its value declines relative to foreign currencies in the open market. Unlike devaluation, which is a policy-driven move, depreciation is influenced by market forces such as supply-demand dynamics, capital flows, and global economic conditions.

Reasons Behind the Recent Decline in Rupee Value:

Internal Factors:

- Rising Inflation: Higher domestic prices reduced the real value of the rupee. And inflation-driven production costs made Indian exports less competitive.
- Widening Trade Deficit: Increased imports, particularly of crude oil, led to higher demand for foreign currencies.
- Fiscal Deficit: Persistent fiscal imbalances put downward pressure on the rupee.
- Policy Ambiguity: Frequent shifts in RBI's exchange rate policy led to market uncertainty.

External Factors:

- Capital Outflows: Foreign investors withdrew funds amid global economic uncertainties and rising US interest rates.
- Geopolitical Tensions: Conflicts like the Russia-Ukraine war affected global energy prices, increasing India's import bill.
- Global Economic Slowdown: Lower global demand for exports added to the rupee's woes.
- US Dollar Strength: Aggressive rate hikes by the US Federal Reserve strengthened the dollar, making the rupee weaker.

Consequences of Falling Rupee:

- Increased Import Costs: The weakening rupee makes crude oil, electronics, and raw materials costlier, worsening India's current account deficit.
- Inflationary Pressures: Rising import costs elevate domestic inflation as businesses pass on increased input costs to consumers.
- Export Competitiveness: While cheaper rupee benefits exports initially, high input costs due to inflation negate these advantages over time.
- Capital Flight: A depreciated rupee reduces investor confidence, prompting foreign investors to withdraw capital from Indian markets.

- Impact on Borrowing: External debt denominated in foreign currencies becomes more expensive, increasing repayment burdens on the government and businesses.

Measures to Restore the Value of Rupee

Monetary Policy Measures:

- Foreign Exchange Intervention: RBI can sell forex reserves in the market to manage demand-supply imbalances and stabilize the rupee.
- Interest Rate Hikes: Higher repo rates make Indian investments attractive, encouraging foreign inflows and strengthening the rupee.
- Currency Swap Agreements: Bilateral agreements with other countries can reduce reliance on the dollar and stabilize foreign currency flows.

Fiscal Policy Measures

- Reducing Import Dependency: Enhance domestic production of high-demand imported goods, such as crude oil substitutes, to lower import bills.
- Boosting Exports: Offer incentives and subsidies to exporters to increase foreign currency earnings and improve the trade balance.
- Infrastructure Development: Develop efficient logistics and supply chains to reduce production costs, enhancing overall competitiveness.
- Encouraging Foreign Investments: Implement policies to attract long-term FDI, creating a stable environment for investors.

Way Ahead:

- Comprehensive Policy Framework: Introduce a well-defined and stable exchange rate policy to reduce volatility and build investor confidence.
- Strengthening Domestic Production: Support programs like 'Make in India' to reduce reliance on imports and improve self-reliance.
- Managing Inflation: Use targeted fiscal and monetary tools to maintain price stability and control inflation.
- Diversified Forex Reserves: Accumulate a mix of currencies in forex reserves to minimize dependence on the US dollar and reduce vulnerabilities.

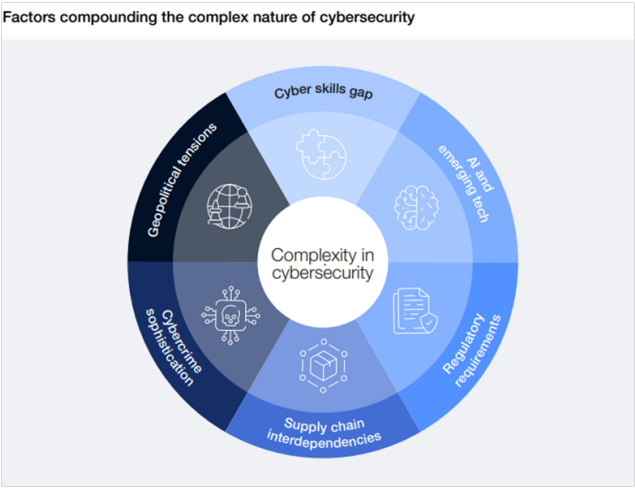
Conclusion:

A stable rupee is vital for economic growth, fiscal stability, and global competitiveness. While immediate interventions are essential, long-term strategies focusing on domestic production, export growth, and robust policy frameworks will ensure sustained economic resilience.

World Economic Forum Reports

Context:

The World Economic Forum has recently released two reports named "Global Cybersecurity Outlook 2025" and "Global Risks Report 2025."



About Global Cybersecurity Outlook 2025:

- Published by: World Economic Forum (in collaboration with Accenture).
- Aim: To examine the cybersecurity trends impacting economies, societies, and organizations.

Key Features:

- Escalating Cyber Threats: Highlights the sophistication of cybercrime amid geopolitical tensions and emerging technologies.
- Widening Cyber Resilience Gap: Smaller organizations face seven times higher struggles compared to 2022, while larger organizations show improvement.
- Regional Disparities: 42% in Latin America and 36% in Africa lack confidence in cybersecurity preparedness, compared to 15% in Europe and North America.
- Public vs. Private Sector: 38% of public-sector entities report inadequate resilience versus 10% of private organizations.
- Workforce Gap: Nearly 49% of public-sector organizations lack sufficient cybersecurity talent.

About Global Risks Report 2025:

- Published by: World Economic Forum.
- Aim: To analyze and prioritize global risks across immediate, short-to-medium, and long-term horizons for informed decision-making.

Key Features:

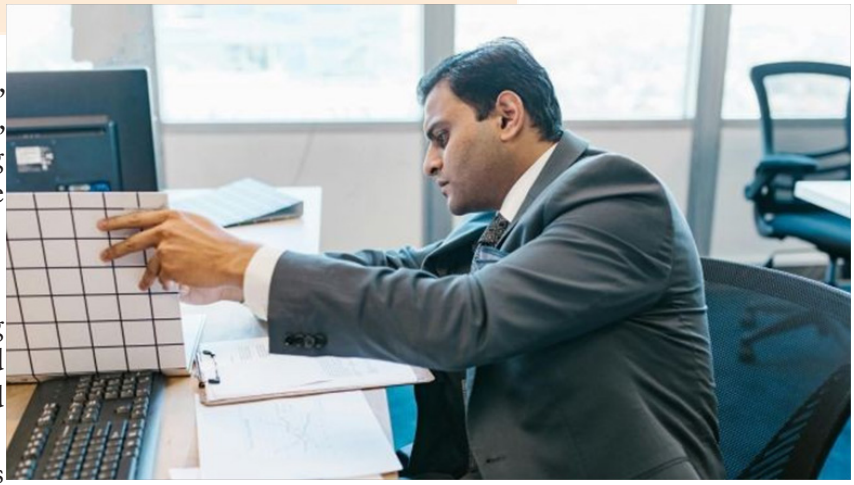
- Global Risks Perception Survey (GRPS): Insights from over 900 global experts.

Timeframe Analysis:

- Immediate (2025): Focuses on urgent risks like cyber threats and geopolitical instability.
- Short-to-Medium Term (2027): Examines risks tied to technological adoption and resource scarcity.
- Long Term (2035): Considers emerging risks such as climate resilience and demographic shifts.
- Sectoral Impact: Highlights the vulnerabilities of public infrastructure, supply chains, and critical services.
- Regional Variances: Identifies differences in preparedness across continents, emphasizing the need for localized strategies.
- In-depth Risk Themes: Provides focused analyses on selected high-priority risk categories.

Long Working Hours Debate

Context:



Proposals such as a 90-hour workweek, presented by L&T Chairman S.N. Subrahmanyan, have sparked controversy, highlighting concerns about workplace culture, employee well-being, and productivity.

Proposal for long working hours:

Prominent business leaders in India, including Narayana Murthy, S.N. Subrahmanyan, and Bhavish Aggarwal, have called for extended work hours.

- They argue that increasing workweeks could drive economic growth and emulate post-war recovery strategies seen in countries like Japan and Germany.
- The proposals suggest a model of 70–90 hours per week to enhance productivity and global competitiveness.

Positives of long working hours:

- Boosts Output: Extended hours could increase work volume and project completion speed.
  E.g. Manufacturing industries in India show higher outputs during peak seasons with overtime work.
- Economic Growth: Longer hours contribute to higher GDP by increasing workforce participation and productivity.

E.g. India's IT sector thrives on high-pressure deadlines to meet global client demands.

- Skill Development: Extended work periods provide opportunities for employees to acquire and refine skills.
  E.g. Startups in Bengaluru often use extended work hours for rapid upskilling.
- Job Security: Employees who commit to long hours may gain better job stability in competitive industries.
  E.g. Contract workers in construction projects benefit from extended work schedules.
- Workplace Resilience: A culture of hard work builds resilience and adaptability.
  E.g. Infosys employees working extra hours during critical projects led to client retention.

Limitations of long working hours:

- Health Risks: Extended hours lead to physical and mental health issues like burnout and stress.
  E.g. A Pune-based Ernst & Young employee reportedly died from workplace stress in 2024.
- Declined Productivity: Fatigue from overwork reduces focus, creativity, and overall efficiency.
  E.g. Reports from the ILO link long hours to lower productivity in South Korea.
- Poor Work-Life Balance: Excessive work hours strain personal relationships and reduce social engagement.
  E.g. Employees in Japan's "karoshi" culture face rising loneliness and depression.
- High Attrition Rates: Long hours increase turnover rates as employees seek balanced work environments.
  E.g. India's IT sector experienced talent migration to companies offering flexible hours.
- Negative Societal Impact: Overwork culture discourages family building and community participation.
  E.g. Japan's aging population is partially attributed to its demanding work culture.

Way ahead:

- Balanced Work Hours: Introduce flexible working models that balance output with personal well-being.
  E.g. Indian startups implementing hybrid work schedules enhance productivity.
- Employee Wellness Initiatives: Promote mental and physical health programs in workplaces.
  E.g. TCS offers stress management workshops for employees.
- Enhanced Efficiency: Encourage tools and technologies to optimize work processes.
  E.g. AI-driven project management tools reduce workload in India's IT sector.
- Cultural Shift: Foster a mindset valuing quality of work over quantity.
  E.g. Microsoft's four-day workweek experiment in Japan boosted productivity.
- Legislative Safeguards: Introduce labor laws to regulate maximum working hours.
  E.g. India's existing laws under the Factories Act provide for limited work hours.

Conclusion:

A balanced approach to work hours, focusing on efficiency rather than mere quantity, is vital for sustainable growth. Organizations must value employee well-being to foster creativity and innovation. As the Indian workforce evolves, promoting smarter work practices will create healthier workplaces and drive long-term success.

Pay Commission

Context:

The Union Cabinet, chaired by Prime Minister, has approved the establishment of the 8th Pay Commission, aiming to revise the salaries of nearly 50 lakh central government employees and allowances for 65 lakh pensioners.

About Pay Commission:

- What it is: A body established by the Central Government to review and recommend changes to the salary, allowances, and pension structures of central government employees and pensioners.
- Established by: Department of Expenditure, Ministry of Finance, Government of India.

Aim:

- Ensure fair compensation for government employees.
- Recommend formulas for revising Dearness Allowance (DA) and Dearness Relief (DR) to offset inflation impacts.

Functions:

- Review pays and allowances of central government employees.
- Suggest structural changes to enhance governance.
- Ensure financial sustainability of salary revisions.

History of Pay Commissions:

1st Pay Commission:

- Year: 1946
- Headed by: Srinivasa Varadachariar

7th Pay Commission:

- Year Established: 2014
- Implemented: January 1, 2016

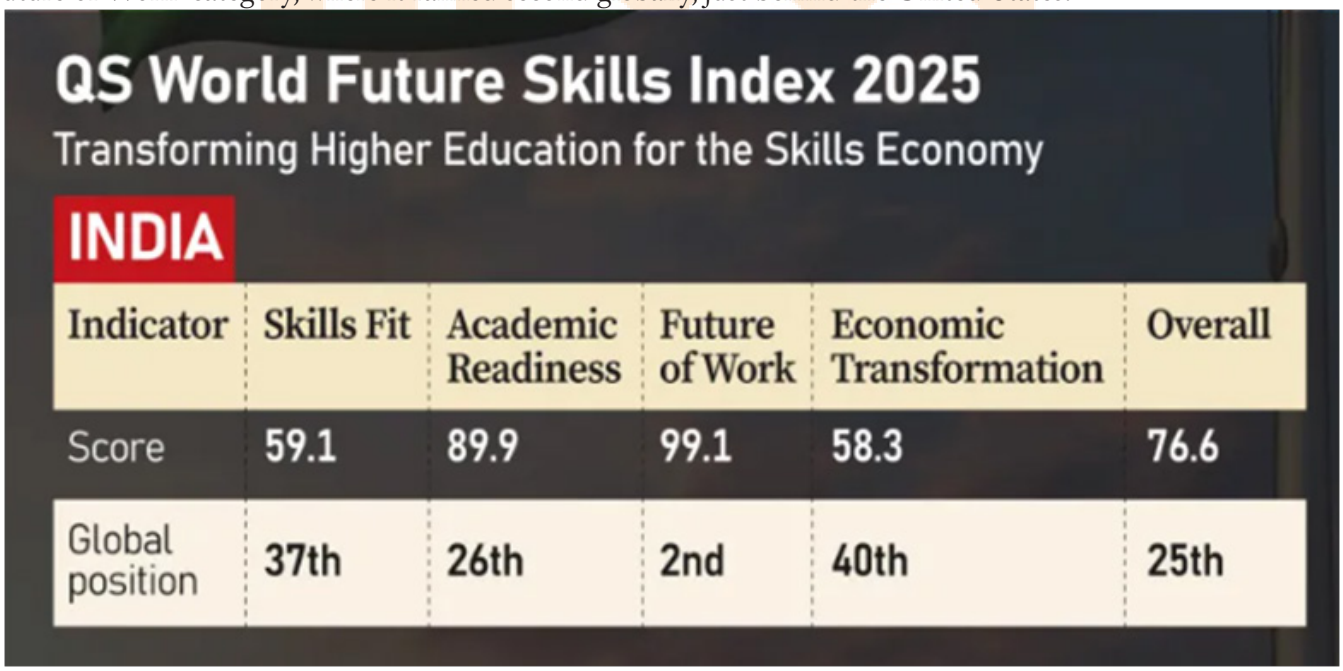
Key Changes:

- Fitment factor set at 57, raising the minimum basic pay from 7,000 to 18,000.
- Maximum salary revised to 2,50,000.
- Expenditure increases of 1 lakh crore for FY 2016-17.

QS World Future Skills Index 2025

Context:

India has ranked 25th overall in the QS World Future Skills Index 2025, with a standout performance in the "Future of Work" category, where it ranked second globally, just behind the United States.



Indicator	Skills Fit	Academic Readiness	Future of Work	Economic Transformation	Overall
Score	59.1	89.9	99.1	58.3	76.6
Global position	37th	26th	2nd	40th	25th

About QS World Future Skills Index:

- What it is: A global ranking system that evaluates countries' readiness to meet evolving job market demands through skill development, education, and economic transformation.
- Released by: London-based Quacquarelli Symonds (QS), known for its education and skills-related rankings.
- Aim: To assess how well countries are preparing their workforce for future skills such as digital competencies, AI, green technologies, and sustainability.

India's Rank:

- 25th overall globally.
- 2nd in the "Future of Work" category, showcasing high preparedness for tech-driven roles.

Key criteria in the QS Future Skills Index:

- Skills Fit: Measures how aligned graduates' skills are with current employer demands.
- Academic Readiness: Assesses higher education systems' ability to prepare students for evolving job markets.
- Future of Work: Evaluates preparedness for roles requiring future-focused skills like AI, digital, and green technologies.
- Economic Transformation: Analyzes capacity for sustainable growth, innovation, and workforce efficiency.

Key insights from the report:

Skills Fit		Academic Readiness		Future of Work		Economic Transformation	
Country	Score	Country	Score	Country	Score	Country	Score
UK	100.00	UK	100.0	United States	100.0	South Korea	100.0
US	94.4	Germany	99.6	India	99.1	Israel	98.9
Canada	90.9	Netherlands	99.3	Mexico	98.2	United States	97.9
Germany	89.2	Australia	98.9	Canada	97.4	Switzerland	96.8
Netherlands	88.6	United States	98.6	Australia	96.5	Japan	95.8

Strengths:

- High readiness in integrating AI and attracting venture capital.
- Robust youth population and dynamic startup culture, positioning India as a key contender globally.

Weaknesses:

- Poor scores in sustainability-oriented innovation and higher education alignment.
- Gaps in fostering creativity, problem-solving, and entrepreneurial thinking.

Opportunities:

- Leveraging the National Education Policy 2020 to address skill gaps and align curricula with industry demands.
- Expanding collaborations between academia and industry to foster innovation.

Nine Years of Start Up India

Context:

On January 16, 2025, India marks nine years of Startup India, a transformative journey that began in 2016. Designated as National Startup Day, this occasion celebrates the nation's strides in fostering a robust and inclusive entrepreneurial ecosystem.

What is Startup India?

Startup India is a flagship initiative of the Government of India, launched on January 16, 2016, to promote a robust entrepreneurial culture. Its aim is to simplify processes, provide funding support, and foster innovation to help startups grow and create employment opportunities.

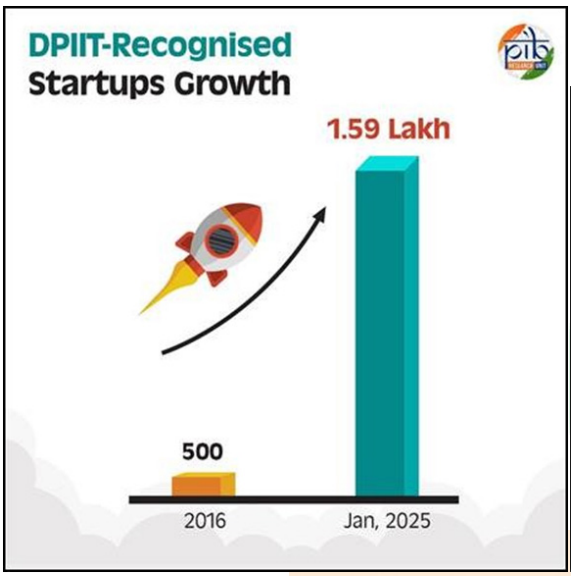
Features of Startup India:

- Ease of Doing Business: Simplified compliance processes and single-window clearances streamline startup registration and operations. Self-certification is allowed under various labor and environment laws.
- Tax Benefits: Eligible startups enjoy tax exemptions for three consecutive financial years to ease financial burdens.

- Funding Support: The 10,000 crore Fund of Funds for Startups (FFS) provides crucial early-stage funding.
- Sector-Specific Policies: Special focus on biotechnology, renewable energy, and agriculture to foster growth in key industries.
- Capacity Building: Programs like iGOT Karmayogi and workshops support skill enhancement, especially in non-metro regions.

Milestones of Startup India:

- Over 1.59 lakh startups recognized by DPIIT as of January 2025, marking rapid growth in the ecosystem.
- Startups have created 16.6 lakh jobs across sectors, significantly boosting employment.
- 73,151 startups with at least one-woman director reflect growing gender diversity in entrepreneurship.
- Flagship programs like BHASKAR platform centralize resources to connect and support ecosystem stakeholders.



Other Government Schemes Supporting Startups:

- Startup India Seed Fund Scheme (SISFS): Financial assistance for proof of concept, prototype development, and market entry.
- Credit Guarantee Scheme for Startups (CGSS): Offers collateral-free loans to ensure financial stability for startups.
- NIDHI: Promotes student-led entrepreneurship with funding and incubation support.
- Make in India: Eases compliance for manufacturing startups and promotes innovation.
- Digital India: Creates digital infrastructure for startups to thrive and scale operations.

Challenges to the Startup Ecosystem:

- Access to Capital: Heavy reliance on foreign funding with limited domestic investment sources.
- Regulatory Bottlenecks: Bureaucratic delays and unclear compliance frameworks hinder smooth operations.
- Skill Gaps: Shortage of professionals in AI, data science, and product development impacts growth.
- Unequal Regional Growth: Tier II and III cities lack strong startup ecosystems and infrastructure.
- Corporate Mismanagement: Governance issues and financial mismanagement in startups raise sustainability concerns.

Way Forward:

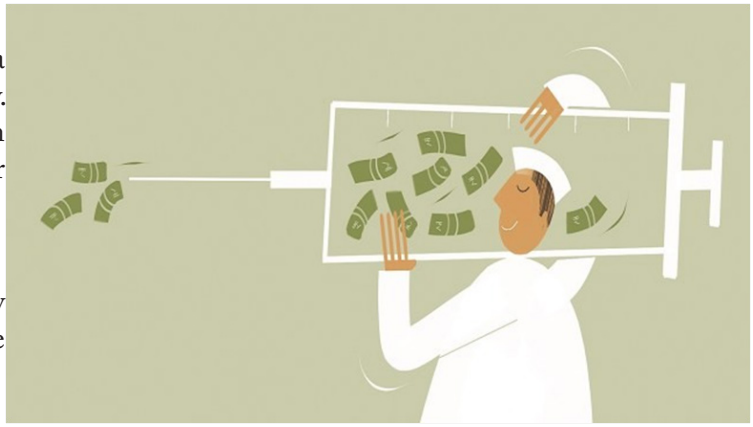
- Encourage Domestic Investment: Leverage funds from insurance companies, pension funds, and family offices.
- Foster Innovation: Strengthen incentives for R&D and improve intellectual property protection frameworks.
- Capacity Building: Promote industry-academia collaboration to address skill shortages in critical sectors.
- Regional Inclusion: Develop infrastructure and ensure digital access in smaller cities and rural areas.
- Regulatory Oversight: Streamline compliance processes and establish ethical business practices frameworks.

Conclusion:

Startup India has been a transformative force, driving innovation, job creation, and economic growth across India. With favorable policies, increased domestic funding, skill enhancement, and a focus on inclusivity, India is well-positioned to become a global hub for entrepreneurship and innovation.

Cash Transfers

Context:



Cash transfers, such as the Mahila Samman Yojana in Delhi, have sparked debates about their efficacy. Critics view them as populist measures that strain state finances, while proponents argue they empower marginalized communities, especially women.

What Are Cash Transfers?

Cash transfers are direct payments made by governments to individuals or households to provide social protection or incentivize specific actions.

Types of Cash Transfers:

- Unconditional Transfers: No strings attached; recipients can use the money as needed (e.g., PM-KISAN).
- Conditional Transfers: Linked to specific actions like school attendance or vaccinations (e.g., Maternity Benefit Program).
- Universal Transfers: Provided to all citizens regardless of income or status.
- Targeted Transfers: Focused on specific vulnerable groups like elderly pensions under NSAP.

Arguments against cash transfers:

- Fiscal Burden: Cash transfers consume funds that could be allocated to critical sectors like health, education, and infrastructure.
- Populist Measure: They are often announced for electoral gains, failing to address deep-rooted systemic challenges.
- Risk of Dependency: Recipients may become reliant on the transfers, reducing their motivation to seek employment.
- Limited Impact: Studies indicate inconclusive outcomes, especially in areas like women empowerment and farm income.
- Competitive Populism: Political parties race to introduce larger schemes, causing significant strain on state finances.

Arguments favouring cash transfers:

- Empowering Women: Direct payments enhance autonomy and help women access education and jobs.
- Direct Benefit Delivery: They bypass bureaucratic inefficiencies and middlemen, ensuring benefits reach recipients.
- Poverty Alleviation: Provide immediate financial relief to the poor, improving their quality of life.
- Economic Stimulus: Increased purchasing power of beneficiaries boosts demand and supports local economies.
- Social Equity: Targets marginalized groups, helping bridge socio-economic disparities in society.

Alternatives to cash transfers:

- Strengthening Public Services: Enhance the quality and accessibility of health, education, and nutrition infrastructure.
- Universal Basic Services (UBS): Provide essential services at low or no cost instead of direct cash payments.
- Job Creation Programs: Develop employment opportunities through initiatives like MGNREGA and skill-based schemes.
- Skill Development: Equip individuals with vocational skills to increase employability and self-reliance.
- Community-Based Programs: Tailor interventions to address localized needs and empower communities sustainably.

Way ahead:

- Balanced Approach: Combine cash transfers with long-term investments in public services for maximum impact.
- Evidence-Based Policies: Implement schemes based on data-driven assessments and measurable outcomes.
- Targeted Implementation: Prioritize the most vulnerable populations for targeted and effective interventions.
- Monitor and Evaluate: Regularly track program performance to identify gaps and improve efficiency.
- Fiscal Prudence: Ensure schemes do not compromise developmental goals or fiscal sustainability.

Conclusion:

Cash transfers are not a panacea but can complement social safety nets when designed and implemented responsibly. A balanced approach integrating cash transfers with robust public investment can ensure both immediate relief and long-term progress.

India's Economic Surge

Context:

India's economy has undergone a transformative journey over the past decade, marked by robust policy measures, increasing global integration, and substantial economic growth.

Data Insights on India's Economic Dominance:

GDP Growth:

- Nominal GDP: Increased from $2.04 trillion (2014) to $3.57 trillion (2023). (Source: World Bank)
- Per Capita Income: Grew from $1,554 to $2,481 during the same period.
- Projected Growth: Expected to reach $5 trillion by 2027 and $30 trillion by 2047.

FDI Inflows:

- Total FDI inflows (2014–24): $709.84 billion, a 69% increase over the previous decade. (Source: Ministry of Commerce & Industry)

Global Rankings:

- Ease of Doing Business: Improved from 142 (2014) to 63 (2019). (Source: World Bank)
- Global Competitiveness Index: Rose from 71st (2015) to 40th currently. (Source: WEF)

Capital Market Growth:

- BSE Sensex surged from 27,507 points (2015) to 78,507 points (2025), reflecting a 185% growth.
- Market capitalization increased to $5 trillion (2024).

Government Initiatives Driving Economic Growth:

- Make in India: Boosted domestic manufacturing, making India the second-largest mobile phone producer globally, reducing import dependency.
- Startup India: Fostered over 100 unicorns and 1.5 lakh startups, valuing the ecosystem at $349.67 billion, promoting entrepreneurship.
- PLI Scheme: Improved sectoral competitiveness by incentivizing production, attracting significant foreign investments.
- Gati Shakti Master Plan: Enhanced infrastructure connectivity, expediting industrial and economic growth across regions.
- Digital India: Promoted digital payments and financial inclusion, bringing more people into the formal economy.

Positives of India's Economic Growth:

- Job Creation: Increased employment opportunities through manufacturing and service sector expansions.
- Innovation Hub: Improved rank on the Global Innovation Index from 76th (2014) to 39th (2024), fostering R&D.
- Financial Stability: Reduced Gross NPAs to 2.6% in 2024, indicating stronger banking sector health.
- Global Presence: Ranked as the third-largest economy in PPP terms, enhancing India's global economic influence.

Limitations of India's Economic Growth:

- Inequitable Distribution: Economic growth benefits often fail to reach marginalized and lower-income groups.
- High Inflation: Persistent food inflation impacts affordability and erodes purchasing power.
- Unemployment: Rising joblessness, with insufficient creation of high-quality employment opportunities.
- Governance Issues: Weak regulatory frameworks and favoritism allegations hinder equitable economic progress.

Way Ahead:

- Inclusive Growth: Develop policies to address inequality and ensure fair distribution of economic benefits.
- Green Economy: Invest in renewable energy and sustainable practices to support long-term growth.
- Focus on MSMEs: Strengthen micro, small, and medium enterprises to create localized employment.
- Skilling Initiatives: Train youth for emerging global opportunities and address skill mismatches in the workforce.

Conclusion:

India's economic trajectory highlights significant progress driven by robust policies and global integration. However, addressing limitations such as inequality and unemployment is essential to sustain inclusive growth and achieve the vision of a $30 trillion economy by 2047.

Minimum Support Price

Context:

Farmer leader Jagjit Singh Dallewal's indefinite fast entered its 43rd day as the Parliamentary Standing Committee on Agriculture, has recommended a "legally binding" MSP.

What is MSP?

- Definition: MSP is the price at which the government purchases crops from farmers to ensure they do not incur losses.
- Established by: Recommended by the Commission for Agricultural Costs and Prices (CACP) under the Ministry of Agriculture, final approval by the Cabinet Committee on Economic Affairs (CCEA).
- Crops Covered: MSP is declared for 23 crops, including cereals, pulses, oilseeds, and commercial crops like cotton and jute.
- Purpose: Protect farmers from price fluctuations, provide income stability, and ensure agricultural growth.

Need for MSP for Farmers:

- Income Stability: MSP protects farmers from losses due to market price dips caused by overproduction or low demand.

  E.g. In 2024, moong prices in Rajasthan were 6,467 per quintal, far below the MSP of 8,682 (Indian Express).

- Inequitable Market Dynamics: Farmers lack bargaining power compared to traders, leading to lower price realization.

  E.g. CACP data shows over 80% of farmers rely on local markets, where prices often fall below MSP.
- Cost of Production: Rising input costs and stagnant yields necessitate MSP to ensure profitability.

  E.g. Fertilizer and diesel prices increased by 15-20% between 2020 and 2024 (Ministry of Agriculture).
- Addressing Rural Poverty: With 86% of farmers being smallholders, MSP prevents distress sales, ensuring sustainable livelihoods.

Feasibility of Legalizing MSP:

- High Fiscal Cost: Procuring all MSP crops could cost 7.5 lakh crore annually, consuming 17% of the Union Budget, limiting resources for other developmental initiatives.
- Direct Compensation Model: Implementing a compensation mechanism for price differences would require 30,000-50,000 crore annually, which is financially more viable.
- Market Intervention: Establishing floor prices in APMC auctions can stabilize market prices and reduce the burden on government procurement.
- Private Sector Role: Mandating private buyers to ensure purchases at or above MSP could distribute the financial responsibility across stakeholders, reducing the load on the exchequer.
- Deficit Payment Scheme: Compensating farmers for the difference between market price and MSP can ensure price assurance without the need for direct procurement of all crops.

Limitations of Legalizing MSP:

- Budgetary Stress: Allocating 17% of the budget for MSP would strain fiscal resources, affecting investments in health, education, and infrastructure.
- Market Disruption: Enforcing MSP might deter private sector engagement, reducing efficiency and competitiveness in agricultural markets.
- Administrative Challenges: Monitoring and implementing MSP transactions for millions of farmers across diverse crops would require significant infrastructure and human resources.
- Regional Inequity: Current MSP procurement disproportionately benefits states like Punjab, Haryana, and UP, sidelining farmers in less developed regions.
- Risk of Overproduction: Guaranteed MSP could lead to over-cultivation of certain crops, aggravating issues like environmental degradation and water scarcity.

Way ahead:

- Targeted Procurement: Expand MSP-backed procurement to pulses, oilseeds, and millets to ensure inclusivity.
- FPO Strengthening: Empower Farmer Producer Organizations for collective bargaining and market access.
- Digital Platforms: Utilize e-NAM and blockchain for transparent price discovery and efficient monitoring.
- Market Reforms: Enhance APMC efficiency and integrate with global markets to stabilize prices.
- Awareness Campaigns: Educate farmers on MSP mechanisms and alternative income sources like Agro-processing.

Conclusion:

A legally binding MSP can address farmers' income insecurity but requires balancing fiscal prudence, market efficiency, and inclusivity. Leveraging technology, targeted interventions, and stakeholder collaboration can ensure a sustainable agricultural future for India.

Chapter-
7

ECONOMIC SURVEY

Economic Survey Latest News

- The Economic Survey 2024-25, tabled in Parliament by Finance Minister Nirmala Sitharaman, highlights deregulation, strategic investments, artificial intelligence (AI), climate adaptation, and inclusive policies as key pillars for economic growth.
- The report underscores the need for private-sector-led innovation, ease of doing business, and a shift in regulatory mindset to propel India's economy forward.

Deregulation as a Growth Stimulus

The Survey advocates a "Deregulation Stimulus", urging the government to minimize bureaucratic red tape and allow businesses to focus on innovation. It calls for:

- Shifting from a "guilty until proven innocent" regulatory approach to a trust-based system.
- Simplifying policies to make them more transparent and accessible.
- Enabling businesses to scale up without excessive compliance burdens.
- The Survey predicts that a deregulation-driven economic environment will help unlock India's demographic dividend and sustain growth over the next two decades.

Boosting Strategic Investments for Economic Competitiveness

- With global trade growth slowing down, the Survey emphasizes domestic and foreign investments to maintain India's economic momentum. It highlights:
- Encouraging private sector investments to strengthen domestic supply chains.
- Attracting foreign capital to enhance competitiveness.
- Developing infrastructure and industrial ecosystems to support long-term growth.
- The Survey underscores that domestic growth levers will play a more significant role than external trade in the coming years.

Climate Change: Focus on Adaptation Over Mitigation

- India's energy transition strategy must prioritize adaptation rather than just emission reduction, according to the Survey. Key recommendations include:
- Diversifying energy sources while balancing economic and environmental sustainability.
- Expanding public transportation as an efficient alternative to private electric mobility.
- Avoiding over-reliance on imported resources for energy security.
- With India's vast geography and resource constraints, the Survey argues that localized adaptation strategies will be more effective than global climate policies.

Artificial Intelligence: Driving India's Tech Innovation

- Recognizing AI's potential, the Survey suggests:
- Establishing AI Centres of Excellence (CoE) in top educational institutions.
- Creating a 1 lakh crore financing corpus to support AI research and private-sector innovation.
- Acknowledging that AI may not be a universal solution for a labor-intensive economy like India.
- The Survey promotes a balanced approach to AI adoption, ensuring employment preservation while leveraging automation for economic gains.

Health and Nutrition: Tackling Processed Food Consumption

- The report raises concerns about the rising consumption of ultra-processed foods (High in Fat, Salt, and Sugar - HFSS) among Indian youth. It recommends:
- Stricter front-of-pack labeling to inform consumers.
- Government regulations over self-regulation in food standards.

- Policies to promote healthier eating habits and physical well-being.
- The Survey emphasizes that public health policies must align with economic growth strategies to ensure a healthier workforce.

Inclusive Development: Women, Farmers, and Youth Empowerment

- For inclusive growth, the Survey highlights:
- Women's Participation: Removing legal and regulatory barriers to increase labor force participation.
- Farmers' Welfare: Supporting income growth and agricultural modernization.
- Youth Development: Investing in education, skill-building, and mental health.
- Poverty Reduction: Advancing economic inclusion through targeted welfare programs.
- The Survey calls inclusive participation the litmus test of effective economic policies.

Industrial Growth and Ease of Doing Business

- The Survey identifies a direct link between industrial activity and business-friendly policies. It notes:
- States with high "Ease of Doing Business" scores have stronger industrial growth.
- Aspiring states must improve industrial policies to attract investments.
- The success of the Production-Linked Incentive (PLI) scheme in sectors like air-conditioner manufacturing proves the impact of government intervention.
- The Survey suggests expanding PLI incentives to other critical sectors.

External Trade and Economic Challenges

- The Survey warns of potential trade restrictions that could impact India's export growth. Key risks include:
- Rising global protectionism affecting market access.
- Widening current account deficit due to import dependencies.
- Geopolitical uncertainties influencing trade agreements.
- To mitigate these risks, India must focus on self-reliance in strategic sectors and expanding domestic consumption.

State of the economy

- Gross Domestic Product (GDP): The Economic Survey has estimated real GDP growth between 6.3% to 6.8% in 2025-26. In 2024-25, India's real GDP is estimated to grow by 6.4%. To become a developed nation by 2047, India would require sustained economic growth of around 8% every year for at least a decade. Sustained investments, improvement in consumer confidence, and pick-up in corporate wages will be important for supporting growth. Rural demand and anticipated decrease in food inflation is expected to provide an upside to near-term growth. Risks to growth include possible commodity price shocks and elevated trade and geopolitical uncertainties. To reinforce medium-term growth potential, India will need to improve its global competitiveness through structural reforms and deregulation.
- Inflation: Retail inflation decreased from 5.4% in 2023-24 to 4.9% in 2024-25 (April-December). This has been driven by reduction in input prices. India's food inflation has remained firm which has not been in line with global trends of stable or declining food inflation. Food inflation increased from 7.5% in 2023-24 to 8.4% in 2024-25 (April-December), primarily driven by commodities such as vegetables and pulses. This can be attributed to supply chain disruptions and reduced harvest of some food items. Vegetables are more susceptible to uneven weather compared to food grains. Certain measures to ensure long-term price stability include: (i) developing climate-resilient crop varieties, (ii) training farmers on best practices and use of high-yield and disease-resistant seeds, and (iii) robust data collection and analysis to monitor prices and stocks. The Survey noted that declining prices of imported commodities is favourable for India's domestic inflation.
- Current account balance: India's current account deficit (CAD) in the second quarter of 2024-25 was 1.2% of GDP as compared to 1.3% of GDP in the corresponding quarter of 2023-24. The recent increase in CAD can be attributed to an increase in merchandise trade deficit. This deficit increased to USD 75 billion in the second quarter of 2024-25 from USD 65 billion in the corresponding quarter of 2023-24. This was cushioned by an increase in net services receipts and private transfers. The Survey noted that India's CAD has been relatively contained compared to other countries such as Brazil and Australia. To remain

competitive and improve participation in global supply chains, India must continue to reduce trade costs and improve export competitiveness.

- Public finances: The central government's indicators of fiscal discipline have progressively improved. The share of capital expenditure in total expenditure of the central government has improved since 2020-21 and was 21% in 2023-24. The Survey noted that fiscal management in the last four years kept the overall savings-investment gap from widening. This has ensured a comfortable financing of the CAD despite moderation in household savings.

Agriculture and allied activities

- Agriculture sector has recorded an annual average growth rate of 5% between 2016-17 and 2022-23. The sector grew at 3.5% in the second quarter of 2024-25. Sustained growth in the sector has been supported by remunerative prices, improved access to institutional credit, enhancement in productivity, and crop diversification. Agricultural income has increased by 5.2% annually over the past decade as compared to 6.2% for non-agricultural income.
- Crop yields in India are considerably lower compared to other countries. This highlights the need for improvements in productivity. Crop productivity is linked to on-farm and post-harvest inputs including access to quality seeds, better irrigation facilities, and improvements in soil health.
- The increasing significance of allied sectors such as animal husbandry, dairying, and fisheries, underscores the importance of diversification in the sector. By tapping into these sectors, farmers can create additional revenue streams that can act as buffers against volatility in traditional crop production. Challenges for the sector include climate change and water scarcity.

Industry

- The industrial sector grew by 6.2% in 2024-25, driven by robust growth in the electricity and construction sectors. Industrial growth declined to 3.6% in the second quarter of 2024-25 due to factors such as: (i) slowdown in manufacturing exports due to intensified trade competition and industrial policies of major trading nations, and (ii) unprecedented levels of monsoon which slowed down activities such as mining and construction.
- Gujarat, Maharashtra, Karnataka, and Tamil Nadu account for around 43% of the total industrial gross state value added. On the other hand, six north-eastern states (excluding Sikkim and Assam) account for only 0.7% of the industrial gross value added. The Survey noted that there is a need to focus on industrial strategies for unique geographies like the north-eastern region. States should make it easier to start and grow business operations.
- India lags in research and development (R&D) with a significant gap across major sectors. The current expenditure on R&D is only 0.64% of GDP which is insufficient and lower than many countries. The Survey recommended fostering industry-academia collaboration, enhancing private sector participation, and prioritising applied research.

Services sector

- The services sector has grown an at average rate of 8.3% between 2022-23 and 2024-25. Its contribution to total gross value added has increased from 51% in 2013-14 to about 55% in 2024-25. So far in 2024-25, the services sector has supported GDP growth when manufacturing has been affected by slowing global merchandise trade.
- The Survey noted that there is a need for appropriate skilling of the labour force for sectoral growth. For this, efforts are needed at all tiers of government, private sector, and skilling institutions. In addition, there is a need to review and amend complicated procedures, regulations, and rules at the grassroot level that hinder the growth of the sector.

Infrastructure

- India's current infrastructure spending needs to be increased to meet development goals. Capital expenditure by the central government on major infrastructure sectors has increased at a rate of 39% from 2019-20 to 2023-24. Despite the measures taken by the central government along with states and public sector undertakings, there is still a significant unmet demand for infrastructure development. This needs to be filled with innovative modes of financing and greater private participation.

- There is a need to accelerate infrastructure investment over the next 20 years to sustain a high growth rate. These cannot be met by the public sector alone as there are binding budget constraints to different tiers of government. Private participation should accelerate in programme and project planning, financing, construction, maintenance, and monetisation.

Employment

- The annual unemployment rate for individuals aged 15 years and above has declined from 6% in 2017-18 to 3.2% in 2023-24. This recovery has been accompanied by an increase in the labour force participation rate and the worker-to-population ratio. The proportion of self-employed workers increased from 52% in 2017-18 to 58% in 2023-24 reflecting growing entrepreneurial activity and preference for flexible working conditions. However, the share of workers in regular/salaried jobs has decreased from 23% to 22%.
- Increasing flexibility in the labour market will create an enabling environment for businesses to grow. India's labour regulations impose extensive compliance requirements on businesses. Micromanaging regulations create unnecessary administrative burdens that hinder business growth.
- There is a need to focus on improving learning outcomes and employability. Improvement may be needed at: (i) the school level for basic language, mathematics, and science proficiency, and (ii) the higher education level by incorporating skills for new age technologies such as artificial intelligence and machine learning.

Deregulation

- There is a tendency for Indian firms to remain small. By doing so, they lose access to institutional capital, skilled talent, and technology infusion. The reason for not scaling up is to remain outside the regulatory radar and steer clear of labour and safety laws. The Survey noted that deregulation is critical for MSMEs rather than large enterprises as the latter usually find a way around compliance. Regulations hurt the ability of businesses to start and grow over time, and increase the cost of operational decisions.
- Indian firms cannot adhere to applicable regulations without hindering growth, investments, and job creation. For instance, exporting firms should have the flexibility to deploy more labour hours in months with a surge in orders. Faster economic growth would need central and state governments to implement reforms that allow small and medium enterprises to operate efficiently. Areas for deregulation include: (i) land, (ii) labour, (iii) transport, and (iv) logistics.

Conclusion: Towards "Viksit Bharat 2047"

The Economic Survey 2025 presents a bold vision for India's growth, focusing on deregulation, investment-driven expansion, AI innovation, climate adaptation, and inclusive development.
By fostering a trust-based business environment, promoting private sector-led growth, and addressing climate and social challenges, India aims to build a competitive and resilient economy on its path to "Viksit Bharat 2047".

Devi Ahilyabai Holkar

Context:

Indira Gandhi National Centre for the Arts (IGNCA) in collaboration with Lokmata Ahilyabai Trishatabdi Samaroh Samiti, hosted a special lecture, 'Devi Ahilya – Empress Renunciate,' to mark the 300th birth anniversary of Devi Ahilyabai Holkar.

About Devi Ahilyabai Holkar:

Birth and Early Life:

- Born: May 31, 1725, in Chondi village, Maharashtra.
- Family: Daughter of Mankoji Shinde, the Patil of Chondi.
- Marriage: Married Khanderao Holkar in 1733 at the age of 8.
- Mentor: Trained in administration, warfare, and diplomacy by her father-in-law Malhar Rao Holkar.

Kingdom Associated:

- Ruled the Holkar dynasty of Indore within the Maratha Confederacy from 1767 to 1795.
- Established Maheshwar (Madhya Pradesh) as the capital of the Holkar dynasty.

History and Her Rise to Power:

- 1754: Husband Khanderao Holkar was killed in the Battle of Kumbher.
- 1766: Father-in-law Malhar Rao Holkar passed away.
- 1767: Son Male Rao Holkar, who briefly ruled, died, leading to Ahilyabai assuming power.
- Ruled for 28 years with a focus on justice, administration, and welfare policies.

Her Reign and Administration:

Good Governance & Public Welfare:

- Conducted daily public hearings to resolve people's grievances.
- Ensured fair justice, once sentencing her own son for a capital offense.
- Removed laws confiscating property from childless widows, ensuring their rights.

Economic and Industrial Reforms:

- Established a textile industry in Maheshwar, now famous for Maheshwari sarees.
- Promoted industrialization and trade while maintaining financial stability.

Religious and Cultural Contributions:

- Rebuilt and restored Kashi Vishwanath Temple in 1780.
- Constructed temples, ghats, and dharmashalas across India, including Dashashwamedh Ghat (Varanasi).
- Ensured a steady supply of Ganga water to distant temples.

Military Contributions:

- Personally commanded troops to defend Indore from external invasions.
- Appointed Tukoji Rao Holkar as Chief of Army to strengthen military defenses.
- Successfully repelled attacks, preserving the stability of Malwa.

Bhashini

Context:

Tripura has become the first northeastern state to sign an MoU with Bhashini, a Digital India initiative, to promote multilingual governance and bridge the digital divide by enabling access to digital services in regional languages.

About Bhashini Platform:

- What it is: Bhashini is India's AI-powered language translation platform designed to facilitate seamless communication and internet accessibility in 22 Indian languages. It uses voice-based technology to overcome language barriers and promote digital inclusivity.
- Developed by: Digital India Bhashini Division (DIBD), under the Ministry of Electronics and Information Technology (MeitY), Government of India.
- Ministry: Ministry of Electronics and Information Technology (MeitY).

Aim:

- To enable easy access to digital services in Indian languages.
- To bridge the digital and literacy divide by promoting multilingual internet usage.
- To create an ecosystem for AI and Natural Language Processing (NLP) resources for innovation in Indian languages.

Features:

- Real-time translation, speech-to-text, text-to-speech, and voice-to-voice translation.
- Integration with government platforms like CM Helpline, eVidhan, and e-Districts.
- Crowdsourcing initiatives (Suno India, Likho India, Bolo India, Dekho India) for public contribution.
- Open-source AI and Natural Language Processing (NLP) resources for developers, startups, and MSMEs.
- Mobile apps (Android and iOS) for easy access and participation.

Enhanced Certificate of Origin (eCoO) 2.0 System

Context:

The Directorate General of Foreign Trade (DGFT) introduced the Enhanced Certificate of Origin (eCoO) 2.0 System, a digital platform aimed at simplifying export certificationCAROTAR-2020-rules/ and boosting trade efficiency.

About Enhanced eCoO 2.0 System:

What is eCoO 2.0?

- The eCoO 2.0 system is an upgraded digital platform for issuing Certificates of Origin (CoO), which authenticate the origin of exported goods. It facilitates exporters with seamless access to both preferential and non-preferential CoOs, ensuring global trade compliance.
- Administering Ministry/Department: Directorate General of Foreign Trade (DGFT), Ministry of Commerce and Industry, Government of India.

Aims of eCoO 2.0:

- Streamlining Export Processes: Simplify the CoO certification process for exporters.
- Enhancing Trade Efficiency: Reduce processing times and improve trade documentation accuracy.
- Supporting Global Supply Chains: Provide transparency for intermediary and re-export trade.

Key Features of eCoO 2.0:

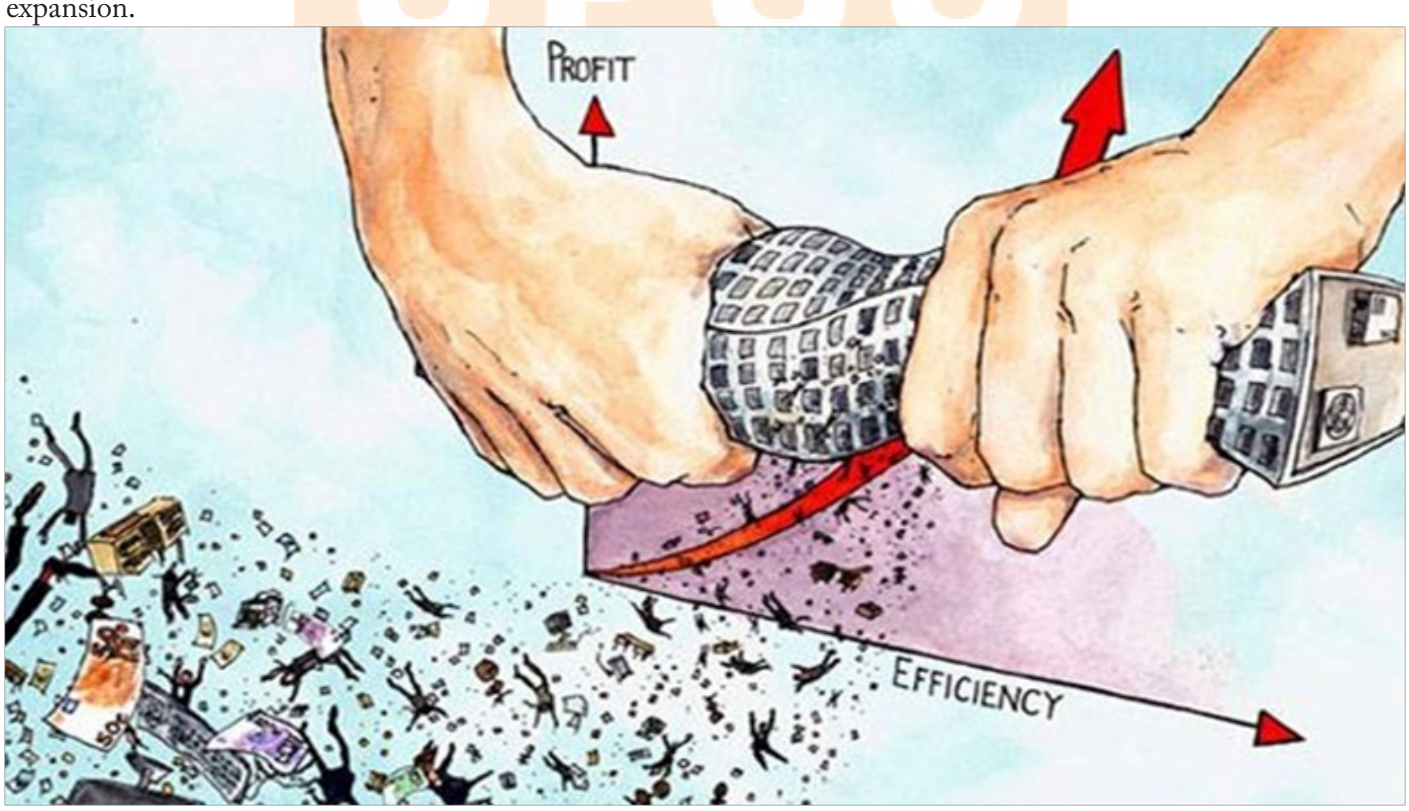
- Multi-User Access: Allows exporters to authorize multiple users under a single Importer Exporter Code (IEC).
- Aadhaar-Based e-Signing: Adds flexibility alongside digital signature tokens for document authentication.
- Back-to-Back Certificates of Origin: Enables re-export and transshipment certifications for non-Indian-origin goods based on verified documentation.
- Mandatory Electronic Filing: Non-preferential CoOs are now mandatorily processed online from 1st January 2025.
- In-Lieu Certificate of Origin: Provides correction options for previously issued CoOs via an easy online application.

External Commercial Borrowing

Syllabus: Economics

Context:

A recent State Bank of India (SBI) report highlights the rising contributions of private sector investments and the role of External Commercial Borrowing (ECBs) in driving corporate financing, modernization, and capital expansion.



What is External Commercial Borrowing (ECB)?

- External Commercial Borrowing (ECB) refers to loans or funding raised by Indian entities from foreign sources, including commercial banks, export credit agencies, and international markets. ECBs are typically used for capital expansion, modernization, and infrastructure projects and are governed by the Reserve Bank of India (RBI) guidelines.

Parameter	Data
Total Outstanding ECBs	$190.4 billion (as of Sept. 2024)
Private Sector Share	63% ($97.58 billion)
Public Sector Share	37% ($55.5 billion)
Hedging (Private Sector)	74% of hedged corpus
ECBs Registered (Apr-Nov 2024)	$33.8 billion
Decline in ECB Costs	6.6% (April-Nov 2024 average)
	5.8% (Nov. 2024)

Need and Significance of ECB:

1. Capital Expansion: ECBs provide long-term funding to finance infrastructure and industrial growth.
2. Cost-Effective Financing: ECBs offer competitive interest rates compared to domestic loans, reducing the cost of borrowing.
3. Modernization and Import of Capital Goods: Corporates use ECBs to modernize operations and import advanced machinery.
4. Foreign Currency Access: ECBs allow Indian firms to access foreign currency, helping in trade and international competitiveness.
5. Private Sector Growth: With 63% of ECBs attributed to private companies, they play a vital role in supporting private sector expansion.

Challenges and Limitations of ECB:

- Exchange Rate Risk: ECBs expose borrowers to currency fluctuations, increasing repayment costs in volatile markets.
- High Hedging Costs: Hedging to mitigate exchange rate risk often adds to the borrowing cost.
- Global Market Dependence: ECBs make Indian corporates reliant on global financial conditions, which can be unpredictable.
- Potential for Over-Borrowing: Mismanagement of ECBs can lead to high corporate debt, affecting financial stability.
- Policy Restrictions: Regulatory limitations may hinder flexibility in fund utilization.

Way Ahead:

- Policy Refinement: Simplify ECB regulations to encourage strategic borrowing for productive sectors.
- Focus on Hedging: Promote affordable and accessible hedging mechanisms to minimize exchange rate risks.
- Sustainable Borrowing: Ensure ECBs are utilized for long-term infrastructure and modernization projects to avoid unsustainable debt.
- Enhanced Monitoring: Strengthen oversight mechanisms to prevent mismanagement of funds and over-leveraging.

Conclusion:

ECBs have been instrumental in financing India's industrial and infrastructural growth. While challenges like exchange rate risks persist, with sound policies and prudent borrowing practices, ECBs can remain a crucial tool for India's economic development.

Fiscal Health Index (FHI) 2025

Context:

The Fiscal Health Index (FHI) 2025, launched by NITI Aayog provides an in-depth analysis of the fiscal health of 18 major Indian states.

About Fiscal Health Index 2025:

- Developed by: NITI Aayog, with data sourced from the Comptroller and Auditor General (CAG).
- Base Year: 2022-23 fiscal data is the reference year for rankings and analysis.
- Aim: To evaluate fiscal health, highlight interstate disparities, and encourage targeted interventions for improving fiscal performance and governance.

Criteria used: The FHI evaluates states across five sub-indices:

- Quality of Expenditure: Efficiency in capital and social sector spending.
- Revenue Mobilization: States' ability to generate revenue from taxes and other sources.
- Fiscal Prudence: Adherence to fiscal deficit targets and financial management.
- Debt Index: States' total debt burden.
- Debt Sustainability: Debt-to-GSDP ratio and interest burden on revenue.

Key Features:

- Tracks fiscal trends from 2014-15 to 2022-23.
- Focuses on 18 major states driving India's economy.
- Provides state-specific insights for policy interventions.
- Highlights top achievers and aspirational states to promote healthy competition.
- Aligns with India's vision for Viksit Bharat @2047.

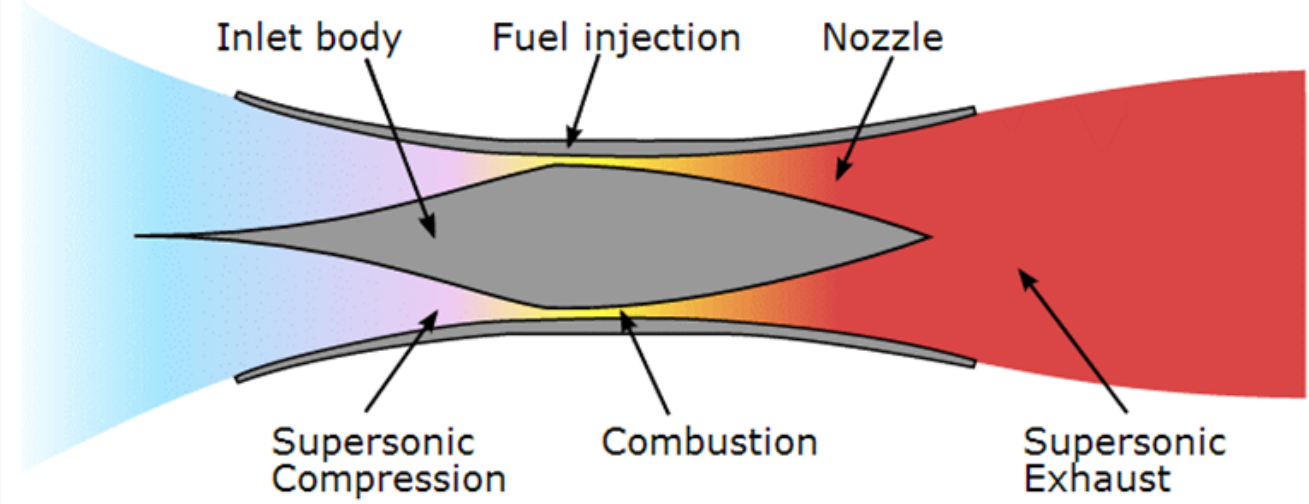
Top 3 Achievers (2022-23):

Rank	State	Category	FHI Score
1	Odisha	Achievers	67.8
2	Chhattisgarh	Achievers	55.2
3	Goa	Achievers	53.6

Supersonic Combustion Ramjet (Scramjet) Engine

Context:

India has achieved a significant milestone in hypersonic technology with the Defence Research & Development Laboratory (DRDL) successfully conducting a 120-second ground test of the Supersonic Combustion Ramjet (Scramjet) engine.



The principle of operation of a scramjet engine

About Supersonic Combustion Ramjet (Scramjet):

What is Scramjet Technology?

- A Scramjet is an air-breathing engine designed to sustain combustion at supersonic speeds, operating efficiently at hypersonic speeds (Mach 5+).
- Developed by: Indigenous efforts by DRDL (DRDO) in collaboration with industry partners.

How it works:

- Utilises the vehicle's forward motion to compress atmospheric oxygen for combustion, eliminating the need to carry an oxidiser.
- Fuel mixes with compressed air in the combustion chamber, igniting to produce thrust at high speeds.
- Innovative flame stabilization techniques ensure ignition in extreme conditions.

Key Features:

- Air-Breathing Engine: Uses atmospheric oxygen, reducing propellant weight.
- Advanced Thermal Barrier Coating (TBC): High-temperature resistance, enhancing engine performance.
- Endothermic Scramjet Fuel: Developed indigenously, it improves cooling and ignition efficiency.
- No Moving Parts: Reduces mechanical complexities, increasing reliability.

Significance of Scramjet Technology:

- Hypersonic Missiles: Enables development of advanced missiles that can bypass air defence systems and deliver rapid, high-impact strikes.
- Reusable Launch Vehicles: Reduces the cost of satellite launches by using air-breathing propulsion systems.
- Strategic Edge: Positions India among a select group of nations (USA, Russia, China) with hypersonic capabilities.
- Reduced Launch Costs: Potential for cheaper, reusable satellite launch systems by minimising fuel weight.
- Technological Breakthrough: Advances in Computational Fluid Dynamics (CFD) and material science, contributing to aerospace innovations.

Netaji Subhas Chandra Bose

Context:

India celebrates Parakram Diwas annually on January 23rd to honor the birth anniversary of Netaji Subhas Chandra Bose, a visionary leader and a key figure in the Indian freedom movement.

About Parakram Diwas:

- Celebrated since: Introduced in 2021 by the Government of India to commemorate the legacy of Netaji Subhas Chandra Bose.

- Aim: To instill patriotism and courage in citizens, particularly youth, and inspire them to face challenges with determination.

Significance:

- Honors Netaji's pivotal role in India's freedom movement.
- Highlights his philosophy of fearlessness and sacrifice for the nation.
- Encourages citizens to embrace his vision of a self-reliant and united India.

About Subhas Chandra Bose:

Birth and Education:

- Born on January 23, 1897, in Cuttack, Odisha.
- Educated at Ravenshaw Collegiate School, Presidency College, and University of Cambridge.
- Cleared the Indian Civil Services (ICS) exam in 1920 but resigned in 1921 to join the freedom struggle.

Role in Freedom Movement:

- Active in the Indian National Congress (INC); became its president in 1938 (Haripura) and 1939 (Tripuri).
- Resigned due to ideological differences with Mahatma Gandhi and formed the Forward Bloc in 1939.
- Founded the Indian National Army (INA) with Japanese support, issuing the call to arms: "Give me blood, and I will give you freedom."
- Established the Azad Hind Government in 1943 to unite Indians against British rule.

Literature and Media:

- Edited the newspaper Forward, advocating for Swaraj.
- Authored The Indian Struggle, detailing India's fight for independence from 1920 to 1934.

Associated Parties:

- Indian National Congress (INC): Advocated complete independence and industrialization.
- Forward Bloc: Founded to unify anti-British forces with socialist ideals.
- Indian National Army (INA): Mobilized overseas Indians and prisoners of war to fight against British forces.

Kho Kho World Cup 2025

Context:

India emerged as the inaugural champions in both the men's and women's events at the Kho Kho World Cup 2025.

About Kho Kho World Cup 2025:

- Hosted in: The tournament took place at the Indira Gandhi Indoor Stadium, New Delhi, India.
- This is the first Kho Kho World cup.
- Organised by: Kho Kho Federation of India (KKFI) in collaboration with the International Kho Kho Federation (IKKF).

Mascots:

- Tejas (Men's Team): A blue gazelle symbolizing brilliance and energy.
- Tara (Women's Team): An orange gazelle representing guidance and aspiration.

Tournament Process:

- Group Stage: Teams were divided into four groups, playing a round-robin format.
- Knockout Stage: Top two teams from each group advanced to quarter-finals, semi-finals, and finals.
- Matches were played under the seven-a-side fast format, as seen in Ultimate Kho Kho.

Winners and Runners-Up:

Category	Winner	Runner-Up	Score
Men's	India	Nepal	54-36
Women's	India	Nepal	78-40

About International Kho Kho Federation (IKKF):

- Established In: 2018 to promote Kho Kho on a global level.
- Headquarters: New Delhi, India.
- Aim: To transform Kho Kho from a traditional Indian game into a recognized international sport and foster global participation.

Functions:

- Organizes international tournaments like the Kho Kho World Cup.
- Standardizes game rules and regulations.
- Coordinates with national associations to expand Kho Kho's reach.
- Promotes the sport's cultural and competitive value through global platforms.

Major Dhyan Chand Khel Ratna 2024

Context:

The Major Dhyan Chand Khel Ratna Award, India's highest sporting accolade, was conferred on remarkable achievers who brought laurels to the nation at Rashtrapati Bhavan.

About Major Dhyan Chand Khel Ratna Award:

- Started in: 1991-1992 (as Rajiv Gandhi Khel Ratna Award).
- Renamed in: 2021, to honor legendary hockey player Major Dhyan Chand.
- Aim: To recognize outstanding performances in sports at the international level, motivate athletes, and inspire future generations.
- Ministry: Ministry of Youth Affairs and Sports, Government of India.

Eligibility Criteria:

- Exceptional international performance over four years.
- Clean anti-doping record.
- Achievements in major competitions like the Olympics, Commonwealth Games, and World Championships.

Nomination and Selection Process:

Nominating Authorities:

- National Sports Federations, Sports Authority of India (SAI), State Governments, and Indian Olympic Association.
- The Government can nominate up to two sportspersons if no nominations are received.

Selection Committee:

- Includes government officials, Olympians, journalists, and experts.
- Points-based system considering medals in major events (Olympics, Commonwealth, Asian Games, etc.).
- Recommendations finalized by the Union Minister of Youth Affairs and Sports.

2024 Winners of Major Dhyan Chand Khel Ratna Award:

Recipient	Sport
Manu Bhaker	Shooting
D Gukesh	Chess
Harmanpreet Singh	Hockey
Praveen Kumar	Paralympic High Jump

Global South and India

Context:

Union Minister Commerce & Industry, during the World Congress on Disaster Management, highlighted India's efforts in aiding neighboring and Global South countries through initiatives like Vaccine Maitri.

What is Global South?

The term Global South broadly refers to developing and less-developed nations, predominantly in Asia, Africa, and Latin America. These nations often face challenges like poverty, income inequality, and limited resources compared to the Global North—wealthier, industrialized nations mostly located in North America, Europe, and parts of Oceania.

- The concept gained traction as a neutral alternative to the outdated term "Third World," highlighting shared histories of colonialism and economic marginalization.

Significance of Global South:

- Economic Growth Potential: The Global South has seen a wealth shift toward regions like Asia-Pacific, where nations like India and China are driving economic growth.

  E.g. BRICS nations now surpass G7 countries in combined GDP.

- Demographic Advantage: With younger populations compared to aging societies in the Global North, these nations have a workforce primed for future global economic contributions.

  E.g. India's youth-oriented policies like Skill India harness this demographic dividend.
- Geopolitical Influence: Global South nations are shaping international relations, moving toward a multipolar world.

  E.g. India's leadership at the Voice of Global South Summit 2023 showcased its geopolitical significance.
- Innovation Hub: Nations in the Global South are rapidly adopting technologies in AI, renewable energy, and digital solutions, becoming global hubs of innovation.

  E.g. India's space initiatives like Chandrayaan-3 and digital payment systems like UPI.
- Addressing Global Challenges: These countries play a key role in tackling global issues like climate change, poverty, and sustainable development.

  E.g. India's International Solar Alliance promotes renewable energy adoption.

Challenges to the Global South:

- Green Energy Funding Gap: Developed nations fail to provide adequate funding for green initiatives, leaving developing nations to bear the brunt of climate change.

  E.g. India consistently calls out the lack of promised climate finance from the Global North.
- Economic Dependency: Many nations remain dependent on external aid, loans, or trade relations skewed in favor of wealthier economies.

  E.g. China's Belt and Road Initiative often leaves smaller nations in debt.
- Limited Access to Resources: Historical disparities in resource allocation hinder development.

  E.g. African nations face challenges in accessing healthcare and vaccines during crises.
- Impact of Global Conflicts: Wars like the Russia-Ukraine conflict exacerbate food and energy insecurity.

  E.g. Rising wheat prices affected multiple African and South Asian nations post-conflict.
- Covid-19 Aftershocks: The pandemic widened economic divides, with fragile economies like Sri Lanka and Pakistan struggling to recover.

  E.g. India's Vaccine Maitri mitigated vaccine inequity during the pandemic.

Way Ahead:

- Collaborative Frameworks: Strengthen South-South Cooperation for mutual growth in areas like trade, healthcare, and technology.

  E.g. India's Global South Centre of Excellence promotes shared best practices.
- Sustainable Development: Invest in green technologies and climate-resilient infrastructure.

  E.g. India's National Green Hydrogen Mission sets a global example.
- Equitable Resource Distribution: Ensure fair access to global resources and funding mechanisms.

  E.g. Advocacy at COP28 for adequate climate financing.
- Economic Diversification: Focus on diversifying economies to reduce dependency on external powers.

  E.g. India's push for self-reliance under Atmanirbhar Bharat.
- Capacity Building: Enhance education, healthcare, and skill development to fully utilize demographic dividends.

  E.g. Initiatives like NEP 2020 and Skill India aim to address skills gaps.

Conclusion:

The Global South represents the promise of a more inclusive and multipolar global order. Nations like India are leading efforts to bridge gaps in equity and resilience, reshaping geopolitics and global development frameworks. As these nations rise, their influence will continue to redefine international relations, ensuring a balanced and sustainable future.

Third Launch Pad

Context:

The Union Cabinet of India, chaired by Prime Minister, approved the establishment of the Third Launch Pad (TLP) at Satish Dhawan Space Centre, Sriharikota, Andhra Pradesh.

About Third Launch Pad (TLP):

- What it is: A state-of-the-art launch infrastructure to support Next Generation Launch Vehicles (NGLV's) and as a standby for the Second Launch Pad (SLP).
- Location: Satish Dhawan Space Centre (SDSC), Sriharikota, Andhra Pradesh.

Aim:

- Support launches of NGLVs, LVM3 vehicles, and human spaceflight missions like Gaganyaan.
- Enhance India's space exploration capabilities for the next 25–30 years.

First Launch Pad (FLP)

- Primary Purpose: Designed for Polar Satellite Launch Vehicle (PSLV) and supports Small Satellite Launch Vehicle (SSLV)

Significance:

- Foundation of India's space transportation.
- Played a key role in India's initial satellite launches.

Second Launch Pad (SLP):

- Primary Purpose: Dedicated to Geosynchronous Satellite Launch Vehicle (GSLV) and LVM3

Notable Contributions:

- Supported Chandrayaan-3 and other national and commercial missions.
- Preparing for human-rated launches for Gaganyaan

Year of Reforms

Context:

The Ministry of Defence (MoD) has declared 2025 as the 'Year of Reforms' to transform India's Armed Forces into a technologically advanced, combat-ready force.

About Year of Reforms:

- What it is: A year-long initiative by the MoD to implement transformative reforms in India's defence sector.
- Aim: Modernizing Armed Forces for multi-domain operations, enhanced jointness, and improved defence preparedness.
- Declared by: Ministry of Defence.

Key Features:

1. Integration and Jointness: Focus on establishing Integrated Theatre Commands for operational efficiency.
2. Emerging Technologies: Prioritize AI, robotics, hypersonic, cyber, and space domains for futuristic capabilities.
3. Simplified Acquisitions: Streamline procurement processes for faster capability development.
4. Defence Export Focus: Position India as a global defence exporter by fostering R&D and public-private partnerships.
5. Veterans' Welfare: Optimize welfare measures for veterans while leveraging their expertise.
6. Collaboration: Enhance civil-military coordination and facilitate technology transfer between defence and civil industries.

LEADS 2024 Report

Context:

Union Minister for Commerce and Industry launched the Logistics Ease Across Different States (LEADS) 2024 report to evaluate logistics efficiency across Indian states and union territories.

About LEADS:

- Full Form: Logistics Ease Across Different States.
- Launched In: 2018.
- Ministry: Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry.

Aim:

1. Assess logistics infrastructure and services across states/UTs.
2. Provide actionable insights for logistics reforms.
3. Foster competitive federalism to enhance logistics efficiency.

Parameters:

1. Logistics Infrastructure.
2. Logistics Services.
3. Operating and Regulatory Environment.

Methodology:

- Based on over 7,300 responses from a pan-India survey conducted.
- Includes inputs from 750+ stakeholder consultations and associations.

LEADS Report 2024 Performance Highlights:

Category	Achievers	Fast Movers	Aspirers
Coastal States	Gujarat, Karnataka, Maharashtra, Odisha, Tamil Nadu	Andhra Pradesh, Goa	Kerala, West Bengal
Landlocked States	Haryana, Telangana, Uttar Pradesh, Uttarakhand	Bihar, Himachal Pradesh, Madhya Pradesh, Punjab, Rajasthan	Chhattisgarh, Jharkhand
North-Eastern	Assam, Arunachal Pradesh	Meghalaya, Mizoram, Nagaland, Sikkim, Tripura	Manipur
Union Territories	Chandigarh, Delhi	Dadra and Nagar Haveli & Daman and Diu, Jammu and Kashmir, Lakshadweep, Puducherry	Andaman and Nicobar Islands, Ladakh

Draft Digital Personal Data Protection Rules

Context:

The draft Digital Personal Data Protection Rules operationalize the Digital Personal Data Protection Act, 2023 (DPDP Act), aiming to establish a robust framework to safeguard personal data in India.

About Draft Digital Personal Data Protection Rules:

- What it is: A framework to enforce the DPDP Act, 2023, ensuring comprehensive digital data protection for Indian citizens.
- Aim: To empower citizens, protect personal data, address data misuse, and promote trust in digital platforms.
- Ministry involved: Ministry of Electronics and Information Technology (MeitY).

Features of the Draft Rules:

- Citizen-Centric Framework: Informed consent, rights to data erasure, and user-friendly grievance mechanisms.
- Balance of Regulation and Innovation: Encourages growth while maintaining citizen welfare with reduced compliance for startups and MSME
- Digital-First Approach: Digital grievance redressal and adjudication for transparency and efficiency.
- Accountability: Annual audits and data protection impact assessments for Significant Data Fiduciaries.
- Inclusive and Pragmatic: Feedback invited from stakeholders via the MyGov platform, reflecting global best practices.
- Awareness Campaigns: Plans for citizen education on their digital rights and responsibilities.

Chapter-
9

INTERNATIONAL RELATION

Paris AI Summit, 2025

Context:

Indian Prime Minister is set to co-chair the Paris AI Summit on February 10-11, 2025, alongside French President Emmanuel Macron.

About the Paris AI Summit 2025:

What is the Paris AI Summit?

- The Paris AI Summit 2025 is a high-level global conference focused on AI regulation, innovation, and ethical governance.
- It builds on previous AI Safety Summits held in Bletchley Park (UK) in 2023 and Seoul (South Korea) in 2024, aiming to create a global consensus on AI policies.

Key Details of the Paris AI Summit 2025:

Host: France

- Chair & Co-Chair: Emmanuel Macron (Chair) & PM Narendra Modi (Co-Chair)
- Participants: Heads of state, AI researchers, policymakers, businesses, and civil society leaders

Aims of the Paris AI Summit:

- Global AI Governance: Establish frameworks for AI regulation and ethical use.
- Balancing Innovation & Regulation: Foster AI growth without stifling development.
- Addressing AI Market Concentration: Examine the dominance of big tech companies like Microsoft, Google, Amazon, and Meta in foundational AI models.
- Public Interest & AI Safety: Ensure AI tools align with security, trust, and responsible use.
- Global Collaboration: Strengthen cooperation between countries to tackle AI-related challenges.

Significance of the Paris AI Summit:

- European AI Strategy: The summit is critical for Europe to compete with US tech giants and China's AI leadership.
- Investment in AI Infrastructure: Discusses major AI projects, such as the $500 billion US Stargate Project.
- AI Accessibility & Ethics: Focuses on affordable AI models and reducing AI development costs.
- India's Role: PM Modi's co-chair position highlights India's growing influence in global AI policy and digital governance.

India – Indonesia

Context:

Indonesian President Prabowo Subianto visits India for the 76th Republic Day celebrations on January 26, 2025, his official visit aims to deepen cooperation in economic, defense, cultural, and strategic domains.

Historical Background:

- Early Civilizational Ties: India and Indonesia share millennia-old cultural and trade links, reflected in shared religious traditions of Hinduism and Buddhism and the maritime legacy of festivals like Bali Yatra.
- Modern Diplomatic Relations: Formal diplomatic ties were established in 1950, followed by the Treaty of Friendship in 1951 and joint participation in the Bandung Conference of 1955, laying the foundation for the Non-Aligned Movement.
- Strategic Partnership: The relationship was elevated to a Strategic Partnership in 2005, further enhanced to a Comprehensive Strategic Partnership in 2018, focusing on economic and security collaboration.
- Act East Policy: Indonesia's inclusion in India's Act East Policy (2014) highlights its importance in India's regional engagement strategy.

Positives in India-Indonesia Relations:

- Economic Cooperation: Bilateral trade reached $29.4 billion in FY 2023-24, with plans to increase it to $50 billion by 2025. India is a key importer of Indonesian coal and palm oil.
- Example: India's $1.56 billion investments in Indonesian sectors like infrastructure and textiles.
- Strategic and Defense Collaboration: Joint military exercises like Samudra Shakti and IND-INDO CORPAT enhance maritime security in the Indian Ocean.
- Example: Defense Cooperation Agreement (2018) facilitates regular military exchanges and joint patrols.
- Cultural Ties: Shared traditions of Hinduism and Buddhism foster cultural diplomacy, while events like the participation of an Indonesian contingent in India's Republic Day Parade strengthen people-to-people ties.
- Connectivity and Tourism: Direct flights introduced in 2023 have boosted tourism, making India the second-largest source of international tourists to Bali.
- Space and Healthcare Collaboration: ISRO supports Indonesia's satellite missions, and Indian hospitals like Apollo are investing in Indonesia's healthcare infrastructure.

Challenges in Bilateral Ties:

- Trade Imbalance: Indonesia's trade volume with China ($139 billion in 2023) far outpaces its trade with India, highlighting underutilized potential.
- Example: India's dependence on limited imports like palm oil and coal lacks diversification.
- Geopolitical Competition: Regional tensions in the Indo-Pacific and Indonesia's partnerships with other nations pose strategic challenges.
- Maritime Security Threats: The shared maritime domain faces threats like piracy, illegal fishing, and geopolitical tensions, requiring enhanced cooperation.
- Limited Investment: Despite improving economic ties, India's investment in Indonesia remains modest compared to other regional players.

- Bureaucratic Hurdles: Regulatory challenges in both countries slow down joint infrastructure and trade projects.

Way Ahead:

- Boost Economic Diversification: Expand bilateral trade to include technology, renewable energy, and agriculture.
- Enhance Defense Cooperation: Strengthen joint maritime security initiatives under India's SAGAR framework and expand military exercises.
- Leverage Connectivity: Promote business and tourism through expanded flight networks and cultural exchanges.
- Focus on Green Energy: Collaborate on renewable energy projects to address climate goals and energy security.
- Deepen People-to-People Ties: Strengthen educational exchanges through scholarships like ITEC and promote Indian diaspora contributions to bilateral cooperation.

Conclusion:

India and Indonesia's multifaceted partnership stands as a cornerstone of regional security, economic growth, and cultural diplomacy. With shared civilizational ties and strategic alignment, both nations are poised to enhance their global and regional influence. Strengthened collaboration will not only boost bilateral ties but also contribute significantly to Indo-Pacific stability.

US withdrawal from WHO

Context:

Recently, the United States, under President Donald Trump, has signed an executive order to withdraw from WHO, citing reasons such as mishandling of the COVID-19 pandemic and the lack of reforms within the organization.

About WHO: Aim and Functions

1. **Aims**
   - Ensure universal health coverage and promote health equity.
   - Strengthen disease prevention and control worldwide.
   - Enhance global preparedness and response to health emergencies.
2. **Functions**
   - Set global health standards and guidelines.
   - Monitor emerging health issues and coordinate responses.
   - Provide technical assistance to countries for capacity building.
   - Facilitate health research and policy development.

WHO's Role in Global Health:

Global Coordination:

- Leads international efforts in combating pandemics, such as COVID-19 and Ebola.
- Collaborates with governments, NGOs, and private entities to strengthen healthcare systems.
- Disease Eradication: Played a key role in eradicating smallpox and reducing polio cases by 99%.
- Capacity Building: Assists low- and middle-income countries in improving health infrastructure, access to medicines, and training healthcare workers.
- Health Policy Advocacy: Advocates for funding and policies addressing non-communicable diseases, mental health, and nutrition improvement.

USA's Decision to Leave WHO:

Reasons Cited:

- Mishandling of the COVID-19 pandemic.
- Perceived political bias within the organization.
- Unequal financial burden on the US compared to other countries, particularly China.

Key Provisions in the Executive Order:

- Cease funding and resources to WHO.
- Recall all US personnel working with the organization.
- Seek alternative international partnerships for health initiatives.

Process to Leave WHO:

- The WHO Constitution does not explicitly outline a withdrawal process.
- However, the US Congress established conditions in 1948 allowing withdrawal with a one-year notice and payment of any outstanding financial commitments.

Impact of USA's Exit:

On WHO:

Financial Strain

- US withdrawal could lead to a loss of approximately 20% of WHO's funding.
- Affects ongoing health programs globally, particularly in disease eradication and pandemic preparedness.

Expertise Gap

- Loss of collaboration with US agencies like CDC reduces WHO's effectiveness in health surveillance.

On Global Health:

Pandemic Preparedness

- Disruption in global frameworks for managing pandemics and health emergencies.
- Reduced resources for equitable vaccine distribution and treatment initiatives.

Increased Global Inequity

- The vacuum created by the US could lead to greater reliance on philanthropy or nations like China, potentially shifting the balance of influence in global health governance.

On India:

Health Programmes

- Reduced WHO support for India's programs on tuberculosis, malaria, HIV, and maternal health.
- Challenges in implementing WHO guidelines for vaccine coverage and disease prevention.

Collaborative Research

- Loss of expertise impacts India's capacity-building partnerships with WHO.

Way Ahead:

- Strengthen Global Partnerships: Nations like India, along with countries from the Global South, should enhance their contributions and leadership roles in WHO initiatives.
- Diversify Funding: WHO must reduce reliance on single-member contributions and increase voluntary funding from philanthropic organizations and regional coalitions.
- Transparency and Reform: Address concerns regarding governance, accountability, and equitable representation of member states in decision-making processes.

Conclusion:

The US withdrawal from WHO presents significant challenges to global health governance and international cooperation. However, it also highlights the need for structural reforms within WHO to enhance efficiency,

transparency, and equitable resource allocation. By leveraging collective leadership and sustainable funding, nations can safeguard WHO's critical role in addressing global health crises.

World Economic Forum

Context:

The World Economic Forum (WEF) Annual Meeting 2025, hosted in Davos, Switzerland, brings together global leaders from business, politics, and civil society to discuss critical global issues.

About World Economic Forum (WEF):

- Established in: The WEF was founded in 1971 as the European Management Forum, later renamed the World Economic Forum in 1987.
- Headquarters: The WEF is headquartered in Cologny, Switzerland.
- Established by: German economist Klaus Schwab, who introduced the concept of "stakeholder capitalism".

Aim:

- To improve the state of the world by fostering public-private cooperation.
- To address global economic, social, and environmental challenges through collaboration among stakeholders.
- 2025 Theme: "Collaboration for the Intelligent Age"

Functions:

- Global Dialogues: Organizes the Annual Meeting in Davos, where leaders brainstorm on solutions to pressing global issues.
- Publications and Rankings: Regularly releases reports like the Global Competitiveness Report, Global Gender Gap Report, Future of Jobs Report and Energy Transition Index.
- Policy Advocacy: Promotes sustainability, inclusive development, and technological innovation.
- Diplomatic Initiatives: Facilitates dialogues, such as the historic 1992 meeting between Nelson Mandela and South African President de Klerk.

Jaishankar's 5-Point Agenda

Context:

As US President Donald Trump prepares for his second term, India is gearing up for a critical diplomatic mission that is based on a 5-point agenda proposed by External Affairs Minister Jaishankar.

Origin:

- India's External Affairs Minister, S. Jaishankar, unveiled a five-point agenda during the BRICS outreach session in Kazan, Russia, on October 24, 2024.
- The agenda aims to promote a South-friendly, equitable, and multipolar world order by addressing the imbalances in global governance, economy, and infrastructure.

What is Jaishankar's 5-Point Agenda?

1. Expanding Independent Platforms: Strengthen forums like BRICS to provide developing nations with alternatives to systems dominated by disproportionately influential powers.
2. Reforming Global Institutions: Advocate for reforms in the United Nations and multilateral development banks, including the expansion of the UN Security Council, to address contemporary global challenges.
3. Democratizing the Global Economy: Promote the creation of regional production hubs and resilient supply chains to reduce vulnerabilities exposed during the COVID-19 pandemic.

4. Correcting Colonial-Era Infrastructure: Develop inclusive and diversified connectivity options that respect territorial integrity and sovereignty, addressing inequities left by outdated systems.
5. Sharing Scalable Solutions: Share India's initiatives like Digital Public Infrastructure, Unified Payments Interface (UPI), and the International Solar Alliance to tackle common global challenges.

Need for the agenda:

- Global Imbalances: Persistent inequalities in the distribution of globalization's benefits, particularly in health, food, and energy security.
- Marginalization of the Global South: Developing countries face inadequate representation in global decision-making institutions.
- Supply Chain Vulnerabilities: The COVID-19 pandemic revealed the fragility of global supply chains, emphasizing the need for regional hubs.
- Geopolitical Instabilities: Conflicts, such as those in West Asia, threaten global security and economic stability.
- Sustainable Development Goals (SDGs): The world is struggling to meet SDGs due to inadequate cooperation and outdated frameworks.

Challenges to the five-point agenda in the modern world:

- Institutional Resistance: Reforming institutions like the UN Security Council faces opposition from existing permanent members.
- Geopolitical Rivalries: Competing national interests among major powers hinder global consensus on multipolarity.
- Economic Protectionism: Rise of trade wars and protectionist policies disrupt efforts to democratize the global economy.
- Technological Gaps: Limited access to advanced technologies in developing nations impedes their ability to contribute meaningfully.
- Global Conflicts: Ongoing regional conflicts and political instability divert resources and focus from collective action.

Way Ahead:

- Strengthening Alliances: Promote South-South cooperation through platforms like BRICS, G20, and regional partnerships.
- Advocating for Reform: Build coalitions to press for reforms in global governance institutions and development banks.
- Fostering Resilience: Invest in regional production capabilities and sustainable infrastructure to reduce economic vulnerabilities.
- Scaling Digital Solutions: Share technological solutions like India's Digital Public Infrastructure with developing nations.
- Promoting Dialogue: Leverage diplomatic platforms to mediate global conflicts and advocate for a rules-based order.

Conclusion:

Jaishankar's five-point agenda reflects India's leadership in fostering a multipolar and inclusive world order that prioritizes the Global South. By addressing inequalities and enhancing cooperation, the agenda aims to create a fairer, more resilient global framework for future challenges.

Exercise La Perouse

Context:

The multilateral naval exercise La Perouse 2025 is underway in strategic straits connecting the Indian and Pacific Oceans, hosted by France.

About Exercise La Perouse:

- What it is: La Perouse is a multilateral naval exercise conducted to strengthen maritime security, enhance interoperability, and develop situational awareness among participating navies.

- Host nation: France leads the exercise, with its Carrier Strike Group spearheaded by the aircraft carrier Charles de Gaulle.
- Location: Conducted in the Malacca, Sunda, and Lombok straits, key chokepoints between the Indian Ocean and the Pacific Ocean.
- Members: The 2025 edition includes India, France, the U.S., Canada, Australia, Indonesia, Malaysia, Singapore, and the U.K.

Aim and Objectives:

- Maritime Safety: Address issues like illegal trafficking, environmental hazards, and maritime crises.
- Enhanced Cooperation: Train in maritime surveillance, air operations, and maritime interdiction.
- Interoperability: Use advanced systems like IORIS for synchronized crisis management.
- Commitment to Rules-Based Order: Promote a stable and secure Indo-Pacific aligned with India's SAGAR (Security and Growth for All in the Region)

Global South and India

Context:

Union Minister Commerce & Industry, during the World Congress on Disaster Management, highlighted India's efforts in aiding neighboring and Global South countries through initiatives like Vaccine Maitri.

What is Global South?

The term Global South broadly refers to developing and less-developed nations, predominantly in Asia, Africa, and Latin America. These nations often face challenges like poverty, income inequality, and limited resources compared to the Global North—wealthier, industrialized nations mostly located in North America, Europe, and parts of Oceania.

- The concept gained traction as a neutral alternative to the outdated term "Third World," highlighting shared histories of colonialism and economic marginalization.

Significance of Global South:

- Economic Growth Potential: The Global South has seen a wealth shift toward regions like Asia-Pacific, where nations like India and China are driving economic growth.

  E.g. BRICS nations now surpass G7 countries in combined GDP.
- Demographic Advantage: With younger populations compared to aging societies in the Global North, these nations have a workforce primed for future global economic contributions.

  E.g. India's youth-oriented policies like Skill India harness this demographic dividend.
- Geopolitical Influence: Global South nations are shaping international relations, moving toward a multipolar world.

E.g. India's leadership at the Voice of Global South Summit 2023 showcased its geopolitical significance.

- Innovation Hub: Nations in the Global South are rapidly adopting technologies in AI, renewable energy, and digital solutions, becoming global hubs of innovation.

  E.g. India's space initiatives like Chandrayaan-3 and digital payment systems like UPI.
- Addressing Global Challenges: These countries play a key role in tackling global issues like climate change, poverty, and sustainable development.

  E.g. India's International Solar Alliance promotes renewable energy adoption.

Challenges to the Global South:

- Green Energy Funding Gap: Developed nations fail to provide adequate funding for green initiatives, leaving developing nations to bear the brunt of climate change.

  E.g. India consistently calls out the lack of promised climate finance from the Global North.
- Economic Dependency: Many nations remain dependent on external aid, loans, or trade relations skewed in favor of wealthier economies.

  E.g. China's Belt and Road Initiative often leaves smaller nations in debt.
- Limited Access to Resources: Historical disparities in resource allocation hinder development.

  E.g. African nations face challenges in accessing healthcare and vaccines during crises.
- Impact of Global Conflicts: Wars like the Russia-Ukraine conflict exacerbate food and energy insecurity.

  E.g. Rising wheat prices affected multiple African and South Asian nations post-conflict.
- Covid-19 Aftershocks: The pandemic widened economic divides, with fragile economies like Sri Lanka and Pakistan struggling to recover.

  E.g. India's Vaccine Maitri mitigated vaccine inequity during the pandemic.

Way Ahead:

- Collaborative Frameworks: Strengthen South-South Cooperation for mutual growth in areas like trade, healthcare, and technology.

  E.g. India's Global South Centre of Excellence promotes shared best practices.
- Sustainable Development: Invest in green technologies and climate-resilient infrastructure.

  E.g. India's National Green Hydrogen Mission sets a global example.
- Equitable Resource Distribution: Ensure fair access to global resources and funding mechanisms.

  E.g. Advocacy at COP28 for adequate climate financing.
- Economic Diversification: Focus on diversifying economies to reduce dependency on external powers.

  E.g. India's push for self-reliance under Atmanirbhar Bharat.
- Capacity Building: Enhance education, healthcare, and skill development to fully utilize demographic dividends.

  E.g. Initiatives like NEP 2020 and Skill India aim to address skills gaps.

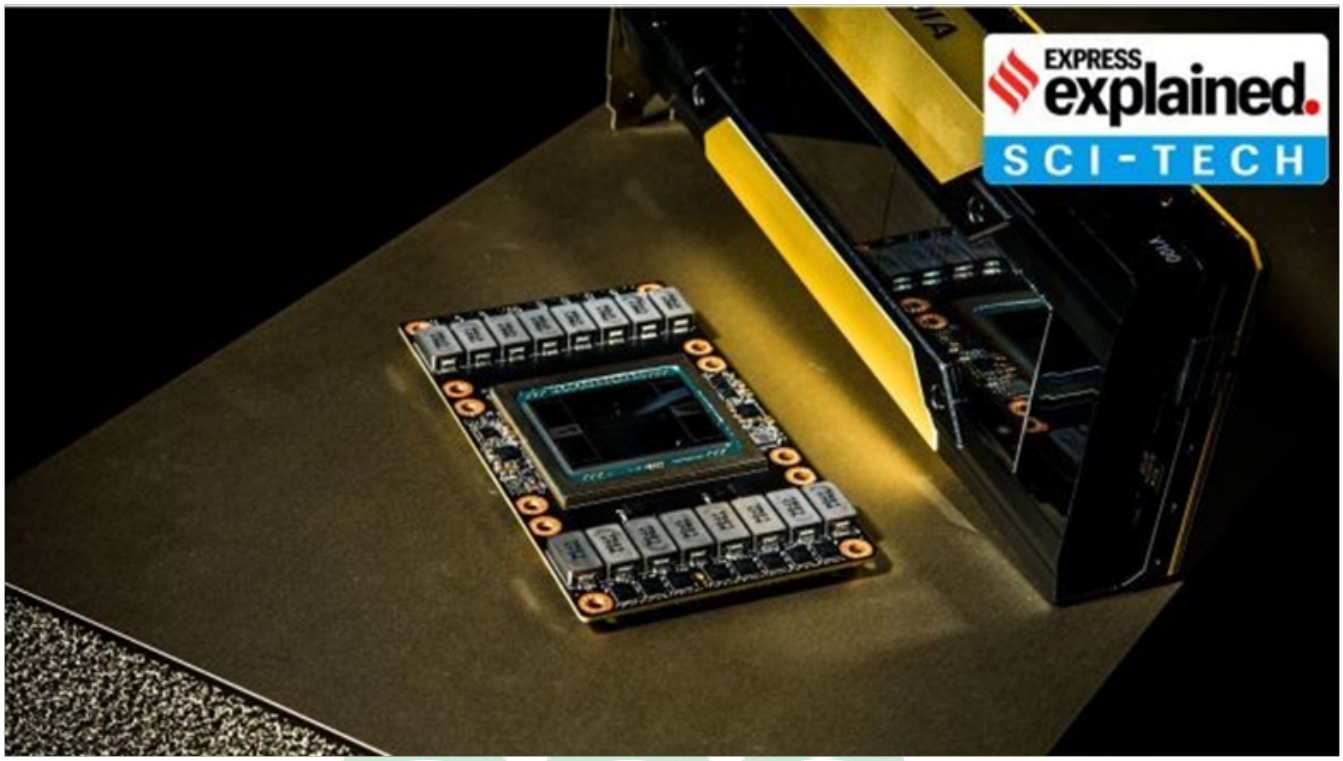
Conclusion:

The Global South represents the promise of a more inclusive and multipolar global order. Nations like India are leading efforts to bridge gaps in equity and resilience, reshaping geopolitics and global development frameworks. As these nations rise, their influence will continue to redefine international relations, ensuring a balanced and sustainable future.

US AI Export Rule

Context:

In the final days of the Biden administration, a new regulatory framework titled "Framework for Artificial Intelligence Diffusion" has been introduced to regulate the export of advanced artificial intelligence (AI) technologies like GPUs.



About US AI Export Rule:

What is it?

- A regulatory framework introduced by the US government to control the export of AI hardware, particularly GPUs, based on national security concerns.
- Aims to ensure advanced AI capabilities remain under the purview of the US and its closest allies.

Categories and India's Placement:

1. **Tier 1:**
   - Includes 18 closest US allies such as Australia, Japan, South Korea, and the UK.
   - Minimal export restrictions; US companies can freely deploy AI technology here.
2. **Tier 2:**
   - Encompasses the majority of countries, including India.
   - Restrictions include a cap on computing power imports unless hosted in trusted environments.
   - Capped at 50,000 advanced AI chips through 2027, extendable upon bilateral agreements.
3. **Tier 3:**
   - Countries like Russia, China, and North Korea face near-total prohibition on importing US AI technology.
4. **Special Provision for India and China:**
   - India: Authorized firms can use exported technology for civilian and military purposes (excluding nuclear use).
   - China: Exported technology is restricted to civilian applications only.

Implications for India:

IndiaAI Mission:

- Potential delays in achieving computing power targets.
- Restrictions could hamper large-scale AI data center development while sparing smaller firms.

Strategic Alliances:

- Highlights India's growing importance in US foreign policy, but underscores its non-inclusion in Tier 1.
- Requires bilateral negotiations for relaxed restrictions.

Domestic AI Ecosystem:

- Limited access to cutting-edge GPUs may slow AI research and innovation.
- Pushes India towards self-reliance in AI hardware manufacturing.

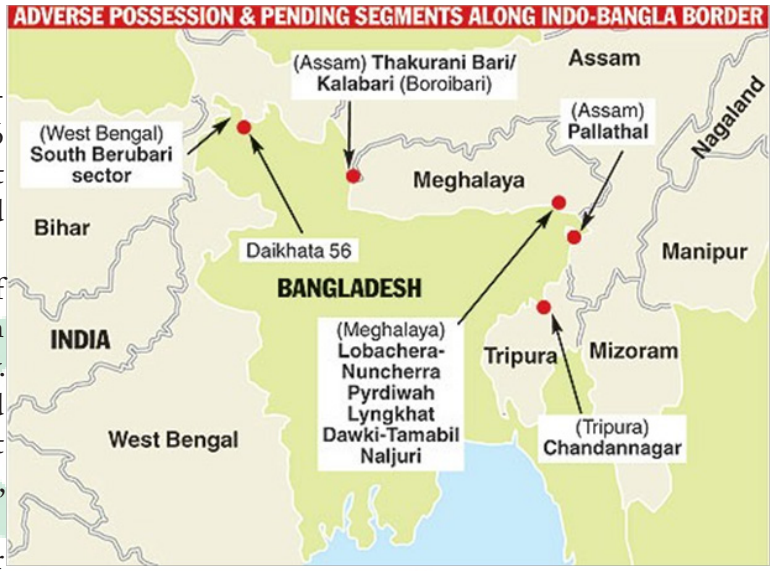
Global Competitiveness:

- Could impede India's ability to compete with nations in Tier 1, especially in AI-driven industries.

India Bangladesh Border Dispute

Context:

Recently, Border Guards Bangladesh (BGB) had attempted to obstruct the construction of a barbed wire fence on the international border in West Bengal's Malda.



India-Bangladesh Border Region:

- Length and Coverage: The India-Bangladesh border stretches for 4,096 km, encompassing five Indian states: West Bengal, Assam, Tripura, Meghalaya, and Mizoram.
- Border Typology: The border is a mix of plains, rivers, and forested terrains, with approximately 180 km of riverine boundary.
- Enclaves and Exclaves: The 2015 Land Boundary Agreement resolved most enclave issues, yet minor disputes persist, particularly in areas like Comilla-Tripura.
- Geopolitical Importance: The border facilitates trade, cultural exchanges, and strategic connectivity, particularly under regional cooperation frameworks like SAARC and BIMSTEC.
- Shared Ecosystem: Border regions include shared rivers like Ganga and Brahmaputra and unique biodiversity requiring cooperative management.

Issues Surrounding the India-Bangladesh Border:

- Border Fencing Disputes: Bangladesh views India's fencing as a violation of the 1975 border guidelines, which prohibit defense structures within 150 yards of the boundary.
- Illegal Migration: The porous border has facilitated undocumented migration, leading to socio-political tensions in Indian states.
- Trans-Border Crimes: Smuggling of cattle, drugs, and arms has been a persistent issue, straining bilateral relations.
- Unresolved Land and Riverine Disputes: Some border segments remain unmarked, and riverine boundaries complicate fencing efforts.
- Impact on Communities: Fencing and border disputes disrupt local livelihoods and access to resources on both sides.

Existing Security Measures to Guard India-Bangladesh Borders:

- Fencing: Approximately 3,141 km of the border is fenced, with plans to complete the remaining sections to curb illegal activities.
- Smart Surveillance: Smart fencing with CCTV, sensors, and drones is being deployed in sensitive areas to monitor movements.
- Water Wing Units: BSF's water wing patrols the riverine border regions, which are unfenced and vulnerable to illegal crossings.
- Coordinated Patrols: Joint operations and flag meetings between the Border Security Force (BSF) and Border Guard Bangladesh (BGB) promote coordination.
- Technological Integration: Advanced radar systems, thermal imaging, and electronic surveillance enhance security in high-risk zones.

Way Ahead:

- Strengthening Bilateral Mechanisms: Regular consultations and confidence-building measures between India and Bangladesh are essential to resolve disputes amicably.
- Completion of Fencing: Addressing land acquisition and terrain-related issues can expedite the completion of border fencing.
- Improved Border Management: Deployment of more technology-driven solutions, including AI and smart fencing, can enhance security.
- Community Engagement: Incorporating local communities into security frameworks can help balance security and livelihoods.
- Resolving River Disputes: Collaborative agreements on water sharing and riverine border demarcation can address long-standing tensions.

Conclusion:

The India-Bangladesh border symbolizes both shared history and modern challenges. Strengthening bilateral cooperation, resolving disputes amicably, and leveraging technology for border management can transform this boundary into a bridge of mutual prosperity and security.

Chapter-
10

DISASTER MANAGEMENT

Stampede

Context:

A tragic stampede at Mahakumbh Mela 2025 in Prayagraj on January 29 resulted in 30 deaths and 60 injuries, raising concerns over crowd management failures.

What is a Stampede?

- Sudden Crowd Surge: A stampede occurs when a large group of people move uncontrollably, often leading to trampling, suffocation, and fatalities.
- Triggered by Panic or Excitement: It can result from rumors, fear, limited space, or sudden movements, creating chaotic crowd behavior.
- Common in Religious Gatherings: Studies indicate that 79% of stampedes in India have occurred during religious events.

Factors Leading to Stampedes:

- Structural Failures: Weak temporary structures, poor barricading, and narrow entry/exits create hazards.
- Poor Crowd Control: Underestimation of crowd size, lack of staffing, inadequate exits, and uncontrolled access lead to overcrowding.
- Panic and Rumors: False alarms or mass hysteria can trigger sudden movements, causing people to rush and fall.
- Fire & Electrical Issues: Short circuits, lack of fire extinguishers, or poor lighting can create panic situations.
- Lack of Coordination: Poor planning among agencies, delayed responses, and absence of real-time monitoring worsen the crisis.

NDMA Guidelines on Preventing Stampedes

- Crowd Estimation and Management: Authorities must assess expected crowd size, control entry points, and regulate footfall.

- Infrastructure and Safety Measures: Strong barricades, emergency exits, and adequate ventilation must be ensured.
- Security and Surveillance: Deployment of CCTV cameras, public address systems, and trained security personnel to monitor crowd movement.
- Emergency Preparedness: Medical teams, ambulances, and fire-fighting units should be strategically stationed for rapid response.
- Public Awareness and Information Dissemination: Educating attendees through signboards, helpline numbers, and real-time digital updates to avoid panic situations.

Challenges in Preventing Stampedes:

- Uncontrolled Crowd Surges: Religious sentiments, lack of discipline, and sudden influx make crowd regulation difficult.
- Inadequate Law Enforcement: Shortage of trained personnel, lack of coordination, and poor sector-wise deployment hinder response efforts.
- Poor Infrastructure Maintenance: Narrow passages, weak bridges, and illegal encroachments create bottlenecks.
- Lack of Technology Integration: Absence of real-time crowd analytics, GPS tracking, and AI-based crowd control systems delays crisis response.
- Resistance to Pre-Registration Systems: Many pilgrims resist mandatory online registration, leading to unmonitored influx and overcapacity issues.

Way Ahead:

- Strict Pre-Registration and Ticketing: Implement mandatory online registrations to control entry limits.
- Advanced AI-Based Monitoring: Use AI and drones for real-time crowd analysis, predicting surges and preventing congestion.
- Training of Security and Volunteers: Deploy well-trained personnel with expertise in crowd psychology and emergency responses.
- Efficient Traffic and Movement Planning: Implement sector-based crowd management, one-way movement routes, and separate emergency lanes.
- Emergency Mock Drills: Regularly conduct stampede response drills to train authorities, security, and public for handling crisis situations.

Conclusion:

As NDMA states, "Prevention is better than cure." Proactive crowd management, technology integration, and strict regulation are crucial to preventing future stampedes. Effective policy implementation and coordination can save lives and ensure safer public gatherings.

Human-Elephant Conflict

Context:

A recent study in Namibia highlights how separate water points and upgraded infrastructure can mitigate human-elephant conflicts.

About Methods to Mitigate Man-Animal Conflicts:

1. Designating Separate Resource Zones: Construct separate water points or dams for wildlife away from villages to reduce direct interactions.

   E.g. Namibia's water dams for elephants under its National Elephant Conservation Plan.

1. Upgrading Infrastructure: Reinforce water points with protective walls, solar-powered pumps, and concrete dams to prevent damage.

   E.g. Solar pump systems in Namibia reduced elephant-induced damages to pipes and tanks.

1. Community Participation: Engage local communities in monitoring and conservation activities to foster a sense of ownership.

   E.g. Namibia's Community Conservation Programme since the 1990s.

1. Buffer Zones and Barriers: Create buffer zones around human settlements using natural fences or trenches to deter wildlife intrusion.

   E.g. Use of bio-fencing in Karnataka to mitigate elephant conflicts.

Relevance in UPSC Exam Syllabus:

- GS Paper 3 – Environment: Strategies for wildlife conservation, ecological sustainability, and mitigating climate impacts.
- GS Paper 3 – Agriculture: Human-wildlife conflicts affecting rural livelihoods and crop losses.
- Essay: Ethical and ecological dimensions of human-animal coexistence.
- Case Studies in Ethics: Balancing development and conservation, role of community participation in sustainable policies.

Chapter-
11

Yojana February 2025

1: Historical Perspectives on Indian Knowledge Systems (IKS)

Introduction

Indian Knowledge Systems (IKS) represent an enduring and evolving tradition that has significantly shaped India's intellectual, cultural, and spiritual ethos.

- Encompassing both material and spiritual dimensions, IKS has influenced global thought across diverse domains.
- The establishment of the Ministry of Education's IKS division in 2020 underscores the importance of documenting and reviving this heritage to ensure its relevance in contemporary contexts.
- As highlighted in the Ishavasyopanishad, true knowledge (Vidya) is holistic, harmonizing spiritual wisdom and material understanding for a balanced and meaningful life.

Components of Indian Knowledge Systems

Vedas:

- The foundational texts of Indian thought: Rigveda, Yajurveda, Samaveda, and Atharvaveda.
- Encompass spiritual, scientific, and practical knowledge, including rituals, governance, and natural sciences.

Upvedas:

- Cover specialized fields such as Ayurveda (medicine), Dhanurveda (archery), Gandharvaveda (performing arts), and Shilpaveda (architecture).

Upanishads:

- Philosophical discourses exploring reality, consciousness, and liberation.
- Introduce the concepts of Paravidya (higher knowledge) and Aparavidya (material knowledge).

Puranas:

- Narratives documenting cosmology, creation, and cultural history.
- Offer insights into ethics, sociology, and philosophy.
- Example: Brahmavaivarta Purana discusses time relativity, paralleling modern scientific ideas.

Characteristics of Indian Knowledge Systems

Holistic Knowledge:

- Balances spiritual wisdom (Vidya) with material understanding (Avidya) to achieve liberation (Vimukti).
- Focuses on individual and societal well-being.

Continuity and Adaptability:

- Preserved through oral traditions for millennia before being documented in texts like the Vedas and Puranas.
- Evolved with changing societal needs while retaining core philosophies.

Historical Timelines and Documentation

Oral Tradition:

- Knowledge transmitted orally for thousands of years.

Documented Texts:

- Vedas (~1500 BCE), Puranas (4th century BCE–11th century CE), and epics like the Ramayana and Mahabharata.

Colonial Period Challenges:

- Decline of IKS under British educational policies.
- Loss of knowledge transmission and proliferation of misconceptions.

Contributions to Various Fields

Philosophy and Ethics:

- Integrates materialism and spirituality.
- Texts like the Bhagavad Gita provide ethical guidance on duty and balance in life.

Mathematics and Astronomy:

- Contributions by Aryabhatta, Baudhyana, and others in trigonometry, calculus, and astronomy.
- Ancient texts detail celestial movements and geometric principles.

Medicine:

- Ayurveda, as detailed in Charaka Samhita and Sushruta Samhita, emphasizes holistic health.
- Sushruta pioneered surgeries like cataract removal.
- The Siddha system of Tamil Nadu highlights herbal and spiritual healing.

Arts and Culture:

- Natya Shastra by Bharat Muni outlines principles of drama, dance, and music.
- Reflects metaphysical and religious themes.

Technology and Crafts:

- Innovations in metallurgy (e.g., Delhi's Iron Pillar), textiles (Muga silk), and ceramics.

Modern Relevance and Revival

Recognition and Integration:

- Initiatives like International Yoga Day emphasize physical and mental well-being.
- Traditional medicine and organic farming align with sustainable living practices.

Policy Frameworks (NEP 2020):

- Promotes the integration of IKS with modern education and sciences.
- Encourages interdisciplinary research and international collaboration.

Practical Applications:

- Sustainable architecture and healthcare rooted in ancient principles.
- Ethical frameworks inspired by the Bhagavad Gita and Upanishads.

Interdisciplinary Research:

- Insights from IKS applied to fields like environmental conservation and ethical technology.

Regional Knowledge:

- Revival of tribal and local knowledge systems from the Northeast, Tamil Nadu, and other regions.

Challenges and Opportunities

Challenges:

- Fragmented documentation and misinterpretations due to loss of traditional custodianship.

Opportunities:

- Collaboration among scholars, institutions, and communities.
- Digitization of ancient texts and preservation of oral traditions.
- Application of IKS to address modern challenges like climate change, healthcare, and education.

Conclusion

Indian Knowledge Systems embody a legacy of wisdom that has enriched human thought for millennia. Integrating

IKS with modern disciplines offers sustainable solutions to global challenges while preserving India's rich heritage. Initiatives like NEP 2020 provide a strategic framework for reviving this invaluable knowledge, ensuring its relevance for future generations.

2: Decolonization of the Mind Through Indian Knowledge Systems (IKS)

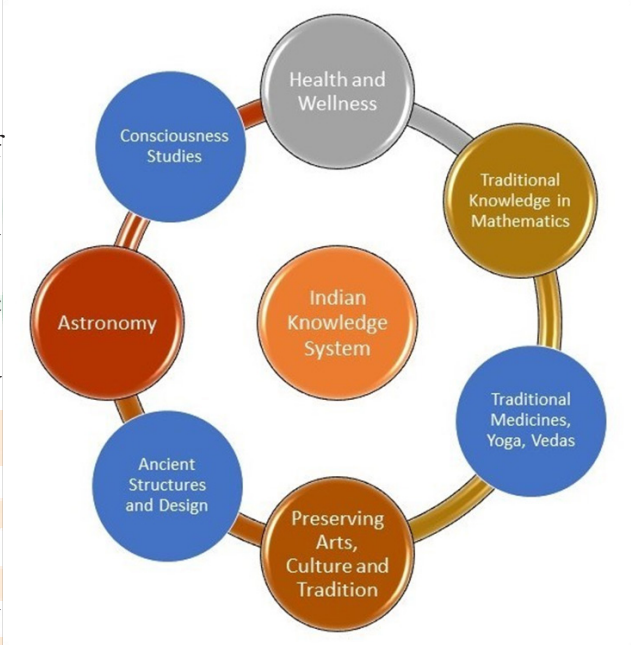
Introduction

India, often referred to as Gyan-Bhoomi (Land of Knowledge), boasts a profound intellectual heritage encompassing philosophy, science, art, medicine, and spirituality.

- Indian Knowledge Systems (IKS), rooted in texts like the Vedas, Upanishads, and Nyaya Shastra, form a structured framework of wisdom rather than mere traditions.
- However, colonial rule marginalized these systems, replacing them with Eurocentric paradigms that instilled a sense of cultural inferiority.
- Decolonizing the Indian mind involves reviving IKS, reclaiming India's intellectual identity, and integrating its wisdom with contemporary challenges.

Indian Knowledge Systems Through the Ages

- Ancient Period: Foundations of Knowledge



Philosophical Foundations:

- Vedas and Upanishads: Delve into existence, the self (Atman), and ultimate reality (Brahman).
- Pathways of Nivritti (self-detachment) and Pravritti (engaged action) shaped ethical living.
- Nyaya: Promoted logical inquiry and scientific reasoning.
- Advaita Vedanta: Advocated a monistic philosophy emphasizing the unity of Atman and Brahman.

Scientific and Mathematical Achievements:

- Discovery of zero, the decimal system, and advancements in trigonometry.
- Ayurveda: A preventive health system focusing on holistic well-being.
- Astronomy: Aryabhata's heliocentric theories and precise astronomical calculations.

Sustainability and Ecological Wisdom:

- Emphasis on sustainable agriculture aligned with natural cycles.
- Community-led forest and water management systems.

Medieval Period: Cultural Evolution

Bhakti Movement:

- Advocated devotion (Bhakti), equality, and vernacular literature.
- Saints like Kabir, Guru Nanak, and Chaitanya Mahaprabhu promoted unity and liberation through faith.
- Fostered social harmony and universal brotherhood.

Jainism and Buddhism:

- Jainism: Explored the dualism of Jiva (soul) and Ajiva (non-soul).
- Buddhism: Focused on Karma, ethical living, and rejecting a permanent self.
- Modern Period: Revival and Challenges

Colonial Disruption:

- Macaulay's Minute (1835) replaced indigenous education with Eurocentric curricula.
- Traditional industries and knowledge systems were systematically undermined.

Contributions of Modern Thinkers:

- Sarvepalli Radhakrishnan: Rooted his philosophy in Advaita Vedanta, emphasizing truth and unity in diversity.
- Swami Vivekananda: Championed rational education and a universal religion grounded in Indian humanism.
- Sri Aurobindo: Advocated spiritual growth through creativity and synthesized idealism with pragmatism.

Impact of Colonization on Indian Knowledge Systems

Cultural Subjugation:

- Indigenous traditions were dismissed as inferior to Western systems.
- Figures like Chanakya were Eurocentrically reframed (e.g., "India's Machiavelli").

Economic and Educational Disruption:

- Colonial policies eroded traditional industries such as textiles and metallurgy.
- Indigenous education was supplanted, alienating Indians from their heritage.

Mental Colonization:

- Edward Said's Orientalism: Exposed stereotypes that perpetuated colonial dominance.
- Frantz Fanon's Colonial Alienation: Highlighted the internalized inferiority among colonized populations.

Decolonization of the Mind Through IKS

Reviving Cultural Identity:

- Reinstate pride in India's intellectual traditions through education reforms.
- Promote regional languages and vernacular literature.

Educational Reforms:

- Integrate Indian philosophies, sciences, and arts into academic curricula.
- Establish interdisciplinary research centers focused on IKS.

Global Relevance of IKS:

- Ayurveda and Yoga are globally recognized health practices.
- Indian ecological practices offer sustainable solutions to contemporary environmental challenges.

Sustainability and Holistic Development:

- Align IKS principles with the UN's Sustainable Development Goals (SDGs).
- Emphasize ethical consumerism and community-based resource management.

Philosophical Guidance:

- Systems like Nyaya and Vedanta offer ethical reasoning and mindfulness frameworks.
- Rediscover ancient wisdom to address modern existential crises.

Conclusion

Decolonizing the Indian mind is not merely about reclaiming lost heritage but also about fostering a transformative journey toward self-realization and global intellectual leadership. By reviving and integrating Indian Knowledge Systems with modern challenges, India can build a sustainable, inclusive, and culturally rooted future. This revival is essential not only for empowering Indians but also for offering humanity universal solutions to its pressing issues.

3- Sanskrit as a Knowledge System

Introduction

Sanskrit, often referred to as the "language of the gods," holds a unique place in India's intellectual heritage. It is not just a language but a profound knowledge system that has shaped philosophy, science, mathematics, and art.

- With its precise grammar and structured methodologies, Sanskrit played a pivotal role in preserving and transmitting knowledge across generations.

Role of Mnemonic Techniques in Knowledge Preservation

1. **Mnemonic Innovation**
   - Structured Techniques: Ancient scholars employed methods like Padapatha (word-by-word recitation) and Krama Patha (sequential recitation) to maintain the integrity of Vedic texts.
   - Accuracy in Preservation: These systems ensured that both content and pronunciation were preserved meticulously.
2. **Oral Tradition**
   - Sanskrit's oral tradition emphasized precision, as it was believed that even minor errors in pronunciation could alter meanings or reduce efficacy

Bhasa: The Universal Communication System

1. **Dynamic Concept of Bhasa**
   - Indian tradition views Bhasa (language) as an evolving and universal entity, transcending specific languages.
   - Unlike the narrow focus on individual languages, the concept of Bhasa highlights communication's intrinsic value.
2. **Sacred Nature of Language**
   - Language was revered as divine in Indian culture, with the Vedas personifying it through deities like Saraswati.
3. **Sanskrit's Unique Identity**
   - In ancient texts like Amarakosha, Sanskrit is not referred to as a proper noun but as a refined form of Bhasa, emphasizing its universality.

Sanskrit and Vedic Philosophy on Language

1. **Unity in Diversity**
   - The Indian perspective considers all languages as derivatives of a single system of communication rooted in the divine concept of Bhasa.
2. **Language as a Medium for Knowledge**
   - Sanskrit's precision enables the accurate recording and transmission of abstract ideas, bridging the gap between knowledge and its dissemination.

Challenges in Language as a Carrier of Knowledge

1. **Ambiguity**
   - Synonyms: Multiple words can represent the same idea (e.g., jal, neer, pani for water).
   - Homonyms: A single word can have multiple meanings, creating potential for misinterpretation.
2. **Temporal and Spatial Evolution**
   - Over time, word meanings, pronunciations, and usages evolve, leading to potential distortion. For instance, Dharma has varied interpretations across cultures and epochs.
3. **Risk of Knowledge Loss**
   - Without standardization, linguistic evolution risks altering the original essence of encoded knowledge.

Development of Sanskrit Grammar (Vyakaran)

1. **Sabdashastra: The Science of Words**
   - Origins in Vedic Studies: Grammar evolved as an auxiliary discipline (Vedanga) to safeguard Vedic pronunciation and interpretation.
   - Panini's Ashtadhyayi: This foundational text is regarded as one of the most advanced grammatical treatises ever created.
2. **Methodology of Vyakaran**
   - Word Dissection: Words are analyzed into:
   - Dhatu (root): The base of the word.

- Pratyaya (suffix): Adds grammatical context.
- Sutra Style: Concise rules (sutras) aid memorization and ensure clarity.
- Default-Exception Framework: General rules are stated first, followed by exceptions.

Key Features of Sanskrit Grammar

1. **Compact and Comprehensive**
   - Panini's Ashtadhyayi comprises approximately 4,000 sutras, detailing every aspect of the language.
2. **Adaptability**
   - While Sanskrit evolved over time, its grammatical framework supports its classical and modern variants.
3. **Refinement of Language**
   - The term "Sanskrit" itself means "refined," underscoring its polished and structured nature.

Contributions of Sanskrit to Knowledge Systems

1. **Linguistics**
   - Panini's grammar laid the foundation for modern linguistic studies, introducing concepts like phonetics, syntax, and semantics.
2. **Science and Mathematics**
   - Sanskrit texts like Aryabhatiya (mathematics and astronomy) and Sushruta Samhita (surgery) demonstrate its clarity and precision in scientific discourse.
3. **Philosophy and Ethics**
   - Works such as the Upanishads and the Bhagavad Gita delve into profound philosophical ideas, facilitated by Sanskrit's precise vocabulary.
4. **Influence on Indo-European Languages**
   - Sanskrit has significantly influenced Indian and European languages, preserving ancient linguistic roots and structures.

Relevance of Sanskrit in the Modern Context

1. **Sanskrit: A Timeless Entity**
   - While it adapts to contemporary Indian languages, Sanskrit retains its classical essence, much like tributaries of the Ganga carrying its legacy forward.

2. The "Dead Language" Debate

- Sanskrit transcends the dichotomy of being "alive" or "dead," as its principles are embedded in modern Indian languages, ensuring its relevance.

3. Knowledge Beyond Borders

- By emphasizing Bhasa as a universal concept, Sanskrit promotes communication and knowledge-sharing across cultures and epochs.

Conclusion

Sanskrit, refined through the meticulous science of Vyakaran, exemplifies India's ethos of preserving and transmitting knowledge across generations. Its unique features—concise sutras, adaptability, and universality—make it a timeless treasure of human civilization. By viewing Sanskrit as a dynamic system rather than a static entity, we can better appreciate its enduring contributions to global knowledge systems and its role in shaping a sustainable future.

4: Konark's Sun Temple: A Geo-Heritage Marvel on the Mahanadi Delta

Introduction

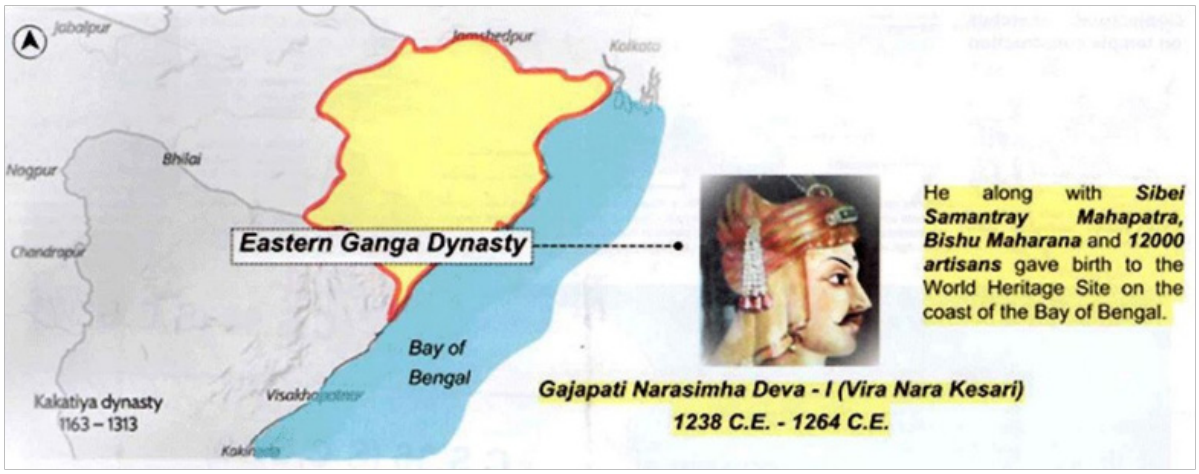
The Sun Temple at Konark, a UNESCO World Heritage Site, stands as a testament to India's architectural brilliance. Constructed in the 13th century by King Narasimhadeva I of the Eastern Ganga Dynasty, the temple is dedicated to Lord Surya, the Sun God.

- Located in Puri district, Odisha, at 19.8134°N latitude and 85.8315°E longitude near the Bay of Bengal, the temple's design emulates a colossal chariot with 12 intricately carved wheels, showcasing the Pancharatha Dravidian and Nagar styles, collectively known as the Kalinga style.
- The name "Konark" originates from the Sanskrit words "Kona" (corner) and "Arka" (sun), signifying the Sun God of the southeast corner.
- Mythologically, this site is where the Sun God triumphed over the demon Arka, enhancing its religious significance.

Historical Context

Construction and Symbolism:

- Built in 1250 CE under King Narasimhadeva I to commemorate his victory over invaders and honor Lord Surya.
- Associated with healing powers attributed to the nearby Chandrabhaga River, which is believed to cure skin diseases.



Cultural and Navigational Significance:

- Referred to as the "Black Pagoda" by European sailors due to its dark appearance and use as a navigational landmark.
- Theories suggest it was constructed to address skin ailments, thank the Sun God for healing the king's leprosy, or celebrate the birth of King Narasimhadeva's son, Bhanu.

Geographical and Geological Aspects

Location and Terrain:

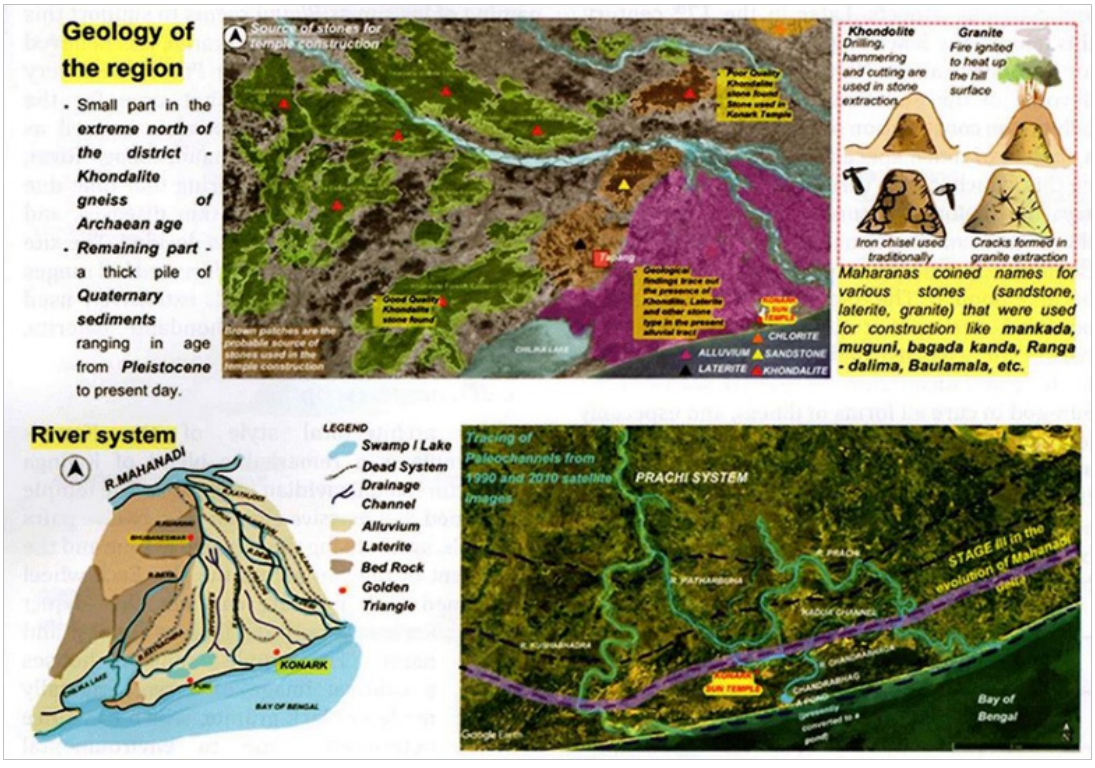
- Situated in the Mahanadi Delta, formed by centuries of sedimentation.
- Major rivers include Mahanadi, Daya, Devi, Kushabhadra, Bhargavi, and Prachi.
- Characterized by sandy and alluvial soils that define its unique geological profile.

Geological Composition:

- Structural elements made from Khondalite gneiss (Archean Age), laterite for foundations, and chlorite for carvings.
- Shifting river courses and sediment deposition have influenced the site's stability.

Role of River Systems:

- Rivers like Mahanadi and Prachi were crucial for transporting construction materials.
- The Chandrabhaga River near the site once held cultural and medicinal significance.



Architectural Marvel

Design and Symbolism:

- Constructed as a massive chariot with seven horses representing the days of the week and 12 pairs of intricately carved wheels symbolizing months and time cycles.
- Detailed carvings depict daily life, mythological themes, and natural motifs.

Materials and Techniques:

- Predominantly used Khondalite, laterite, and chlorite stones locally named Mankada, Muguni, and Ranga Dalima.
- Stones transported via wooden rollers and rafts on the Mahanadi River.
- Involved a collaborative effort of architects (Sthapaka), designers (Sthapati), surveyors (Sutragrahin), sculptors (Taksaka), and builders (Vardhakin).

Sanctum Features:

- Originally housed a massive black granite idol of Lord Surya, now deteriorated.
- Architecturally aligned to allow sunlight to illuminate specific areas during solstices.

Environmental Challenges

Cyclones and Weathering:

- Vulnerable to cyclonic winds exceeding 250 km/h due to its coastal location.
- Historic cyclones, including the 1737 Supercyclone, have caused substantial damage.

Sand Drift and Abrasion:

- Sand accumulation and salt-laden winds pose constant threats; reforestation efforts, including Casuarina and Pinang trees since 1906, aim to mitigate these effects.

Tidal Erosion:

- Tidal surges have eroded parts of the structure, threatening its longevity.

Cultural and Geo-Heritage Importance

Tourism and Symbolism:

- A globally renowned site for its architectural, mythological, and cultural significance.
- Embodies India's ancient cosmology, merging art, astronomy, and spirituality

Wildlife Sanctuary:

- The Balukhand-Konark Wildlife Sanctuary, established in 1984, preserves the local ecosystem around the temple.

Conservation Efforts

Key Challenges:

- Environmental threats such as cyclones, erosion, and sand drifts.
- Human factors like unregulated tourism and pollution.

Restoration Initiatives:

- Restoration projects spearheaded by the Archaeological Survey of India (ASI).
- Reforestation serves as a natural barrier against environmental threats.
- Advanced studies to assess and mitigate structural vulnerabilities.

Future Plans:

- Promotion of sustainable tourism practices.
- Development of advanced conservation technologies.

Conclusion

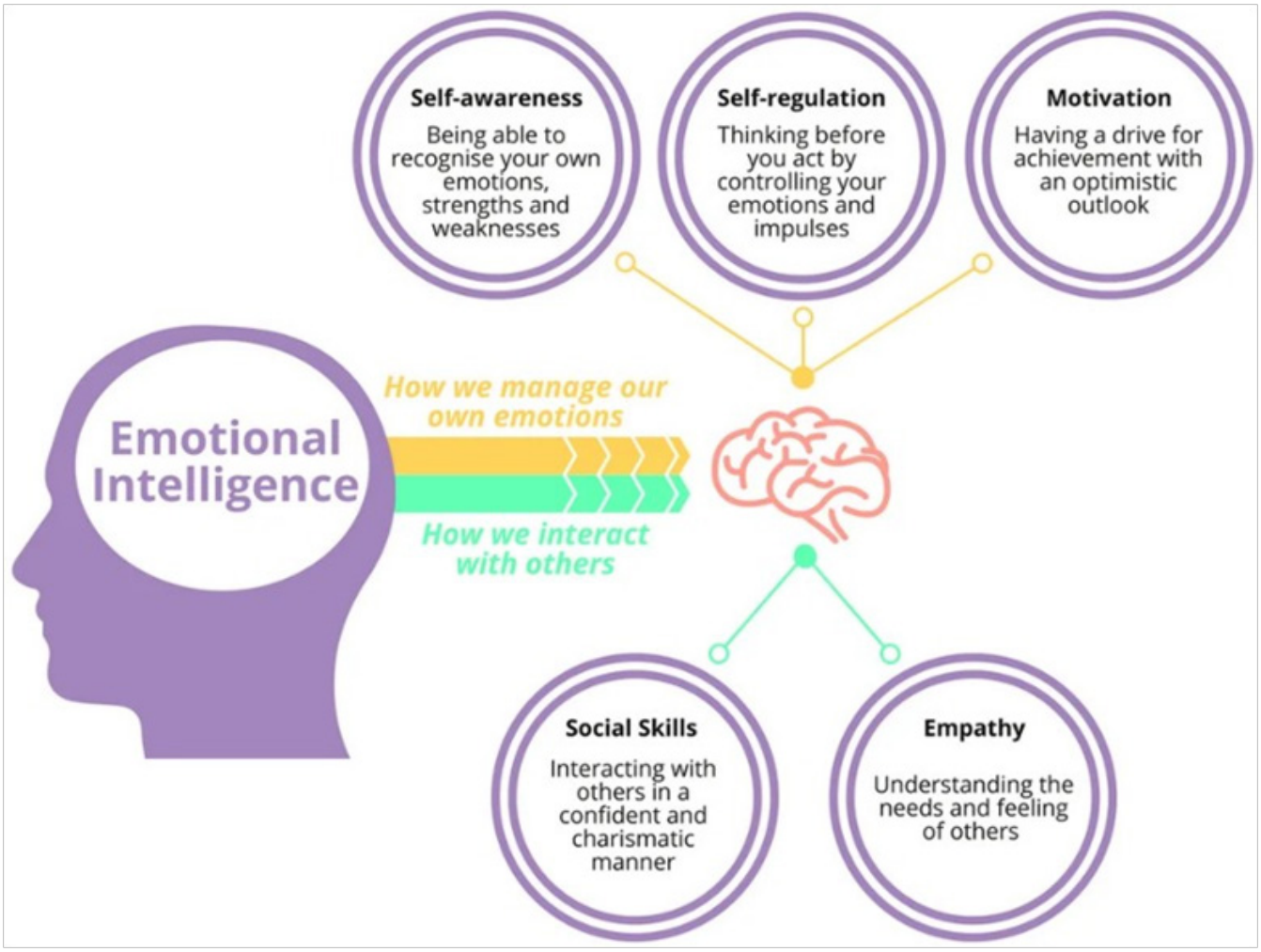
The Sun Temple at Konark exemplifies India's rich cultural heritage, artistic innovation, and scientific foresight. While facing environmental and anthropogenic challenges, focused conservation measures can safeguard this magnificent heritage site for future generations. It is not merely an architectural marvel but a symbol of humanity's creative ingenuity and the collective responsibility to preserve our cultural legacy

5: Emotional Intelligence in Public Administration: A Buddhist Perspective

Introduction

Emotional Intelligence (EI) is the ability to recognize, understand, and manage your own emotions, as well as the emotions of others. It's also known as emotional quotient (EQ).

- It is vital for effective public administration, where decisions impact society at large.
- It involves self-awareness, empathy, and emotional regulation—attributes essential for building trust, cooperation, and ethical governance.
- Buddhist teachings, emphasizing mindfulness, emotional balance, and ethical living, offer profound insights for administrators facing complex societal challenges.



Emotional Intelligence in Public Administration

i. Importance of EI in Governance:

- Public administration requires a people-centric approach, demanding empathy and sensitivity toward diverse communities.
- EI strengthens communication, fosters public trust, and supports equitable decision-making.

ii. Core Components of EI for Administrators:

- Self-awareness: Recognizing emotional triggers to avoid biased decisions.
- Empathy: Understanding and addressing citizens' concerns fairly.
- Emotion Regulation: Staying composed under pressure to ensure sound judgments.

iii. EI and Democratic Leadership:

- Encourages shared values and inclusivity.
- Facilitates conflict resolution and cooperation among stakeholders.

Buddhist Philosophy and Emotional Intelligence

i. The Buddhist Understanding of Emotions:

- Buddhist teachings analyze emotions, their origins, and their influence on behavior
- The Abhidharma Samuccaya classifies emotions as virtuous (kusala) or non-virtuous (akusala), aiding emotional regulation.

ii. Mental Afflictions in Buddhism:

- The six root afflictions—attachment, anger, pride, ignorance, doubt, and distorted views (klesa)—disrupt mental balance and hinder rational decisions.

iii. Strategies for Managing Negative Emotions:

- Mindfulness: Cultivating awareness of thoughts and emotions.
- Compassion and Wisdom: Prioritizing altruism and clarity in judgment.

Buddhist Practices for Emotional Intelligence in Public Administration

i. Cultivating Equanimity:

- Addressing the "eight worldly concerns" (gain and loss, fame and disrespect, pleasure and pain, praise and disparagement) helps maintain impartiality.
- Equanimity mitigates self-serving behavior and promotes balanced decision-making.

ii. Practical Applications:

- Limiting Desires: Encouraging contentment to uphold ethical choices.
- Introspection: Regular self-reflection fosters humility and gratitude.
- Acceptance of Change: Adopting a balanced perspective to handle unforeseen challenges.

Relevance of Buddhist Teachings to Public Administration

i. Mindful Decision-Making:

- Encourages prioritizing long-term societal welfare over short-term gains.

ii. Conflict Resolution:

- Compassion-driven approaches help mediate disputes effectively.

iii. Sustainable Leadership:

- Builds resilience and adaptability to address evolving governance challenges.

Conclusion

The integration of Emotional Intelligence with Buddhist principles creates a comprehensive framework for ethical public administration. By emphasizing mindfulness, compassion, and equanimity, administrators can enhance their ability to serve society while maintaining personal well-being. Buddhist teachings on emotional regulation and ethical living ensure balanced, empathetic, and effective governance.

6: India's Global Capability Centers (GCCs) Lead to the Next Generation

Global Capability Centers (GCCs) are offshore or nearshore entities that provide specialized services to a parent company.

- They are also known as Global In-house Centers (GICs) or Captive Centers.

Functions of Global Capability Centers (GCCs)

- Service Provision: GCCs deliver a diverse array of services such as Information Technology (IT), Research and Development (R&D), customer support, and business process outsourcing.
- Enhancing Efficiency: By optimizing business processes, GCCs enable companies to streamline operations and reduce operational costs.

- Fostering Innovation: GCCs play a crucial role in helping companies stay competitive by driving innovation and facilitating sustained growth.
- Talent Acquisition: GCCs connect organizations with a global talent pool, enabling them to tap into specialized expertise and resources.

Global Presence: India is home to over 1,800 GCCs, which account for more than half of the world's total GCCs.
Employment: These centers employ 1.9 million people directly, generating a significant multiplier effect in local economies.

Economic Contribution:

- Market Growth: From $19.6 billion in 2014-15 to $60 billion in 2022-23, reflecting an annual growth rate of 11.4% (NASSCOM-KPMG).
- Multiplier Effect: For every $1 invested, GCCs generate $3 in economic output.
- Job Multiplier: Each direct job in a GCC leads to the creation of five indirect jobs in local economies.

Key Drivers for GCC Growth

(i) Ease of Doing Business

- SPICe+ Framework: This simplifies company incorporation by reducing administrative processes and time.
- Jan Vishwas Act (2024): Decriminalized 183 provisions across across 42 central acts, significantly easing compliance and promoting a pro-business environment.

GCCs in India from outsourcing to outpacing

(ii) Make in India

- FDI Policies: The 100% foreign ownership allowance in various sectors enables greater independence for foreign companies.
- Special Economic Zones (SEZs): SEZs offer various tax benefits, including a 100% income tax exemption on export profits for the first five years, enhancing business efficiency.

(iii) Digital India Initiatives

- Skill India Digital (2023): A collaborative initiative to develop future-ready skills, involving the Centre, State governments, private organizations, and higher education institutions.
- AI Ecosystem Development: Government interventions at the ministry level bolster India's position in artificial intelligence and other cutting-edge technologies.

India's Competitive Edge

(i) Transition to High-Value Services

- GCCs in India are evolving to focus on:
- Research and Development (R&D)
- Intellectual Property (IP) creation
- High-value services, transforming into innovation hubs and Centers of Excellence (COEs).
- From functioning as cost centers, GCCs are now profit-generating entities.

(ii) Strategic Expansion to Tier-2 and Tier-3 Cities

- Cities like Ahmedabad, Kochi, Visakhapatnam, Jaipur, and Coimbatore are becoming attractive destinations due to:
- Lower operational costs.
- Availability of a skilled and diverse talent pool.
- This expansion drives local economic growth by boosting demand in sectors like real estate, hospitality, transportation, and retail.

(iii) Outperforming Global Competitors

- Countries like Malaysia, Vietnam, and the Philippines focus mainly on low-cost labor and basic BPO services but lack a strong talent pool and advanced infrastructure.

India's Advantage:

- Cutting-edge digital infrastructure, including high-speed internet and modern office spaces.
- A thriving innovation ecosystem supported by both the government and private sector.

Economic and Social Impact of GCCs

- Job Creation: Beyond direct employment, GCCs stimulate job growth in sectors such as retail, real estate, and hospitality.
- Innovation Ecosystems: Partnerships with startups, universities, and research institutions foster innovation, creating a blend of global and local solutions.
- Infrastructure Development: The emergence of GCCs in Tier-2 and Tier-3 cities accelerates urban growth and contributes to the development of local economies.

Challenges and Opportunities

Challenges:

- Talent retention in the face of global competition.
- Infrastructure gaps in emerging cities.
- The need for policy alignment with the rapidly changing global business environment.

Opportunities:

- Strengthening skill development initiatives.
- Investing in smart city projects and improving connectivity.
- Continuous policy updates through stakeholder consultations.

Conclusion

India's GCC ecosystem exemplifies the nation's ability to innovate, adapt, and lead. By leveraging a skilled workforce, digital readiness, and progressive policy reforms, India has solidified its position as a global leader in the GCC space. This success not only drives economic growth and infrastructure development but also fosters innovation, making India a critical player in the global value chain.

Chapter-
12

Kurukshetra February 2025

1- ISRO's Role in Rural Development

India's rural areas are home to over 65% of its population and constitute the backbone of the nation's socio economic fabric.

- However, challenges such as fragmented agricultural practices, inadequate infrastructure, limited access to healthcare, and vulnerability to natural disasters continue to hinder the development of rural communities.
- The Indian Space Research Organisation (ISRO), through its advanced space technology, has emerged as a key enabler of rural transformation.
- By leveraging remote sensing, Geographic Information Systems (GIS), and satellite-based applications, ISRO has significantly contributed to bridging the rural-urban divide and fostering sustainable development.

ISRO and Agricultural Development

Enhancing Agricultural Productivity

- Crop Monitoring and Yield Estimation: Satellite imagery provides accurate data on crop acreage, health, and productivity. This information supports effective planning of the Public Distribution System (PDS) and export strategies.
- Pest and Disease Management: Remote sensing identifies pest-affected areas, enabling timely intervention and minimization of crop losses.
- Soil Health Management: Programs like the Soil Health Card Scheme use satellite data to analyze soil fertility, moisture levels, and nutrient deficiencies, offering farmers guidance on optimal crop selection and resource utilization.

Supporting Government Initiatives

- Pradhan Mantri Fasal Bima Yojana (PMFBY): ISRO's satellite data facilitates accurate assessment of crop damage and quick disbursement of insurance claims.
- Digital Agriculture Mission: Through initiatives like AgriStack and Krishi Decision Support Systems (Krishi DSS), ISRO integrates remote sensing data with real-time analytics for decision-making support.

Water Resource Management

Watershed Development

- Integrated Watershed Management Programme (IWMP): ISRO's geospatial tools enable mapping of watershed areas, aiding in soil and water conservation.
- Groundwater Recharge and Monitoring: Satellite imagery identifies groundwater depletion zones and facilitates planning of recharge structures.

Irrigation Efficiency

- Optimizing Water Use: Satellite data supports monitoring of irrigated areas, ensuring efficient allocation of water resources.

- Drought Preparedness: Tools like the National Agricultural Drought Assessment and Monitoring System (NADAMS) integrate satellite and meteorological data to forecast droughts and plan mitigation measures.

Disaster Management and Preparedness

Early Warning Systems

- Flood Management: ISRO's Flood Early Warning System (FEWS) provides real-time alerts for floodprone areas, reducing loss of life and property.
- Cyclone Monitoring: Satellites like INSAT deliver timely weather updates and disaster alerts, enhancing preparedness.

Post-Disaster Recovery

- Damage Assessment: High-resolution imagery aids in mapping inundated areas, evaluating damages, and planning relief efforts.

Rural Connectivity and Infrastructure

Village Resource Centres (VRCs)

To enhance rural connectivity and digital inclusion, ISRO has established 473 Village Resource Centres in collaboration with NGOs and state governments. These centers provide services such as:

- Telemedicine and tele-education
- Agricultural advisories and skill development
- Career counseling for rural youth

Government Schemes

- Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA): GIS-based tools improve transparency in planning and implementation of rural employment projects.
- Pradhan Mantri Gram Sadak Yojana (PMGSY): Satellite-based mapping optimizes rural road planning, enhancing connectivity and accessibility.

Healthcare and Education

Bridging the Healthcare Divide

- Telemedicine: ISRO's satellite-based telemedicine program connects remote healthcare facilities with specialists in urban centers, enabling consultations and training for medical staff.
- eSanjeevani: This telemedicine initiative leverages ISRO's technology to offer healthcare services to rural populations.

Enhancing Educational Access

- EDUSAT: As the world's first dedicated education satellite, EDUSAT facilitates distance learning for rural students, offering access to quality educational resources and reducing the urban-rural educational gap.

Land and Property Management

Land Records Modernization

- Digital India Land Records Modernization Program (DILRMP): Satellite data ensures accurate mapping of land parcels, streamlining ownership records and minimizing disputes.
- SVAMITVA Scheme: Launched in 2020, this initiative uses drones and geospatial technology to map rural land parcels, empowering villagers with property ownership records.

Bhuvan Panchayat

ISRO's Bhuvan Panchayat portal provides geospatial data for decentralized planning, aiding Gram Panchayats in resource management and governance. It supports:

- Mapping of natural resources
- Infrastructure planning
- Monitoring of rural development projects

Promoting Aquaculture and Horticulture

Sustainable Aquaculture

- Water Quality Monitoring: Satellite data monitors parameters like chlorophyll concentration and turbidity, crucial for sustainable fish farming.
- Site Selection: Geospatial analysis identifies optimal locations for aquaculture based on salinity, nutrient availability, and pollution levels.

Horticultural Development

- Crop Stress Monitoring: Hyperspectral imaging assesses plant health, enabling better planning of production and distribution of fruits and vegetables.
- Supply Chain Optimization: Satellite data facilitates efficient management of horticultural supply chains.

BharatNet: Digital Empowerment of Rural India

BharatNet, one of the world's largest rural broadband projects, utilizes ISRO's satellite technology to:

- Connect over 2.5 lakh Gram Panchayats with high-speed internet
- Enable e-governance, e-health, and e-education services
- Facilitate last-mile connectivity to households and institutions

Conclusion

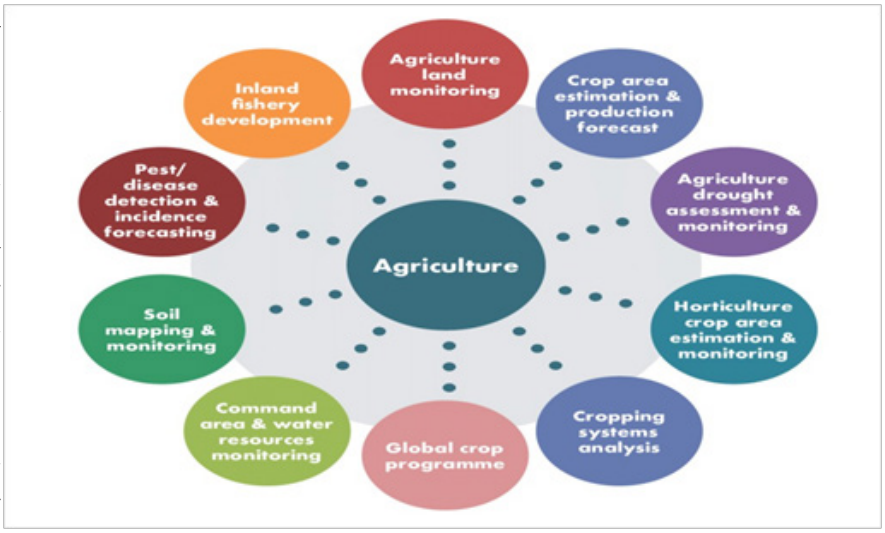
ISRO's innovative use of space technology underscores its pivotal role in transforming rural India. From agriculture and water management to disaster preparedness and digital empowerment, ISRO has made remarkable contributions to sustainable rural development. As India strides towards becoming a developed nation, leveraging space technology will be crucial in ensuring inclusive growth and reducing rural-urban disparities. ISRO's efforts exemplify the potential of science and technology to create a better future for India's rural population.

2- Space Technologies: Bridging the Rural-Urban Gap in India

Space technology has revolutionized sectors like agriculture, disaster management, communication, and environmental monitoring, contributing significantly to rural development in India. Satellite-based services, remote sensing, and communication technologies have empowered rural populations and supported national growth.

Role of Space Technologies in Communication

Space technologies, particularly communication satellites like GSAT, have played a critical role in bridging the digital divide in rural India. These satellites facilitate telemedicine, e-learning, and digital governance, ensuring equitable access to services. Rural areas are now connected to global networks, improving healthcare, agricultural advisory, and government schemes.



Applications in Agriculture

Space technology has transformed agriculture by providing critical data for crop monitoring, soil analysis, and weather prediction. Key applications include:

- Crop Monitoring and Yield Estimation: Satellite imagery helps detect issues like nutrient deficiencies and pest infestations, enabling early intervention and accurate yield estimation.
- Irrigation Management: Satellites track groundwater levels and surface water availability, helping design

efficient irrigation systems.

- Agricultural Advisory Services: Platforms like Kisan Call Centers and mobile apps provide real-time advisories on best practices, pest control, and market prices, empowering farmers with actionable knowledge.

Village Resource Centres (VRCs)

In collaboration with NGOs and government agencies, ISRO has launched Village Resource Centres (VRCs) to deliver space-based services directly to rural areas. VRCs have conducted numerous programs in agriculture, healthcare, and skill development, benefiting millions in rural communities.

Disaster Management and Space Technologies

Space technologies are invaluable in disaster management. Satellites equipped with remote sensing capabilities help track hazards, assess disaster impacts, and support early warning systems. For example, satellites monitor cyclones, floods, and wildfires, aiding timely evacuations and relief efforts. GPS technology also plays a key role in locating survivors and maintaining connectivity in affected regions.

Environmental Monitoring

Satellite imagery and remote sensing tools are crucial for monitoring soil quality, water availability, and vegetation health, assisting in sustainable resource management and environmental protection. Key applications include:

- Precision Agriculture: Satellite data helps optimize irrigation and pest management.
- Tracking Deforestation and Land Degradation: Remote sensing enables monitoring of deforestation and land degradation, allowing timely interventions to protect ecosystems.

Telemedicine: Space Technology for Rural Healthcare

Launched by ISRO in 2001, the Telemedicine Program connects rural healthcare centers to urban hospitals via satellite communication. This program provides access to specialist consultations and diagnostic services, significantly improving healthcare delivery in remote areas.

Satellite-based Weather Prediction for Rural Upliftment

Satellite-based weather prediction technologies, such as INSAT-3D and Megha-Tropiques, play a transformative role in rural India, particularly in agriculture. Accurate weather forecasts help farmers make informed decisions on crop sowing, irrigation, and harvesting, thus enhancing productivity and sustainability.

Geospatial Solutions for Natural Disaster Management

Geospatial technologies, including GIS, remote sensing, and satellite imagery, are essential in managing natural disasters like floods, droughts, and forest fires. These technologies support real-time monitoring, early warning systems, and disaster response strategies.

Conclusion

Space technologies are essential in bridging the rural-urban gap in India. They contribute to improving agricultural productivity, disaster management, healthcare, and environmental sustainability. By leveraging these advancements, India is fostering a more inclusive, resilient, and sustainable future for its rural communities, ensuring a brighter tomorrow for rural India.

3- Reimagining the Future of Learning: Educating on Space Technology

As India aspires to become a global leader in the space economy, there is an urgent need to prioritize education on space technologies. This approach can empower students and the workforce to harness its potential, driving innovation and sustainable development.

The Growing Importance of Space Technology

Space technology is pivotal in addressing global challenges like climate change, disaster management, and sustainable development. The United Nations Office for Outer Space Affairs (UNOOSA) introduced the Space4SDGs initiative, highlighting its role in achieving all 17 Sustainable Development Goals (SDGs), including Quality Education and Decent Work and Economic Growth.

Key Applications:

- Education: High-speed internet connectivity, remote learning solutions, and digital attendance systems.
- Economy: Enhancing sectors like banking, agriculture, disaster resilience, and communications to drive GDP growth.

- Global Impact: According to the World Economic Forum, the global space economy is projected to grow from $630 billion (2023) to $1.8 trillion by 2035, with an average annual growth rate (AAGR) of 9%. India's space economy is expected to grow even faster, reaching $77 billion by 2030 at a compound annual growth rate (CAGR) of 26%.

Integrating Space Education into Learning Systems

School Curriculum:

Incorporating space technology into school syllabi can inspire students to solve real-world problems. Examples include:

- Using satellite data for renewable energy mapping.
- Teaching urban planning with geospatial technologies.

Digital Learning Post-COVID:

- Deployment of cost-effective satellite communication systems like VSAT in underserved areas.
- Promoting geospatial technologies to improve educational equity and resource management.

Global Best Practices

Countries like the USA, Japan, and the UAE provide valuable models:

- USA: NASA employs tools like augmented reality (AR) to make space concepts accessible and engaging.
- Japan: JAXA's outreach programs include astronaut simulations and satellite design workshops.
- Europe: The European Space Agency (ESA) offers resources and competitions for space-themed projects.

Opportunities in India

India's Space Policy 2023 outlines strategies to promote space-related education and innovation:

- Young Scientist Program (YUVIKA) by ISRO introduces students to satellite building and mission planning.
- The UN-affiliated Centre for Space Science and Technology Education in Asia and the Pacific (hosted in India) offers courses in remote sensing, satellite communications, and space science.
- EDUSAT: Bridging the rural-urban gap through satellite-based e-learning content.

Strengthening Education:

- Access to Information: Outreach programs on Indian missions like Chandrayaan and Gaganyaan, using digital media and documentaries.
- Skill-Oriented Curriculum: Introducing courses in satellite design, AI, robotics, and data analysis.
- Collaborations: Enhanced ISRO-private sector partnerships through programs like SpaceKidz and INSPACe.
- Teacher Training: Specialized training for educators to integrate space examples into teaching.
- Rural Focus: Mobile exhibitions and satellite-based resources to inspire students in underserved areas.

Challenges

- Awareness Gap: Limited understanding of space technology's relevance beyond niche careers.
- Educator Preparedness: Lack of technical expertise among teachers.
- Curricular Resistance: Exam-oriented education discourages interdisciplinary learning.
- Socioeconomic Barriers: Rural and economically disadvantaged students face limited access to resources.

Conclusion

Space technology has transformative potential in science, economy, and sustainability. India must leverage education to prepare students for space-related careers and innovations. Key steps include:

- Integrating space technology into curricula.
- Enhancing public-private collaborations.
- Investing in rural outreach and teacher training.

Global practices offer valuable insights, but India must tailor these strategies to its unique challenges. By building a strong foundation in space education, India can not only inspire its youth but also position itself as a leader in the global space economy.

4- Satellite-Based Early Warning Systems for Drought and Flood Management

Natural disasters like droughts and floods pose significant challenges to rural agriculture, threatening food security and farmer livelihoods.

- Satellite technology provides transformative solutions for precise monitoring, early warning, and risk mitigation.
- Combining Indian and global satellite programs with collaborative efforts can enhance disaster preparedness and promote sustainable agricultural practices.

Impact of Droughts and Floods

Droughts

A drought is a temporary reduction in water availability below normal levels due to sub-normal rainfall, erratic distribution, or high water demands. It adversely impacts humans, vegetation, livestock, and ecosystems. India faces various drought types:

- Meteorological: Caused by rainfall deficits.
- Agricultural: Insufficient soil moisture for crops.
- Hydrological: Depletion of surface and groundwater resources.
- Socioeconomic: Impacting livelihoods and economic activities.

Key Effects in India:

- Crop Yields: Insufficient water during critical growth phases reduces productivity, causing economic losses.
- Livelihoods: Persistent droughts push farmers into debt, forcing rural migration.
- Livestock: Scarce fodder and water weaken livestock health, lowering productivity.
- Water Resources: Over-reliance on groundwater depletes aquifers, creating long-term scarcity.

Floods

Floods, caused by excessive rainfall or overflowing rivers, have immediate and long-term impacts:

- Crop Destruction: Submerged fields cause complete agricultural losses.
- Soil Degradation: Topsoil erosion reduces fertility, affecting future cultivation.
- Infrastructure Damage: Essential systems like irrigation and roads are destroyed.
- Health Hazards: Stagnant water creates breeding grounds for diseases.

Satellite Imagery in Early Warning Systems

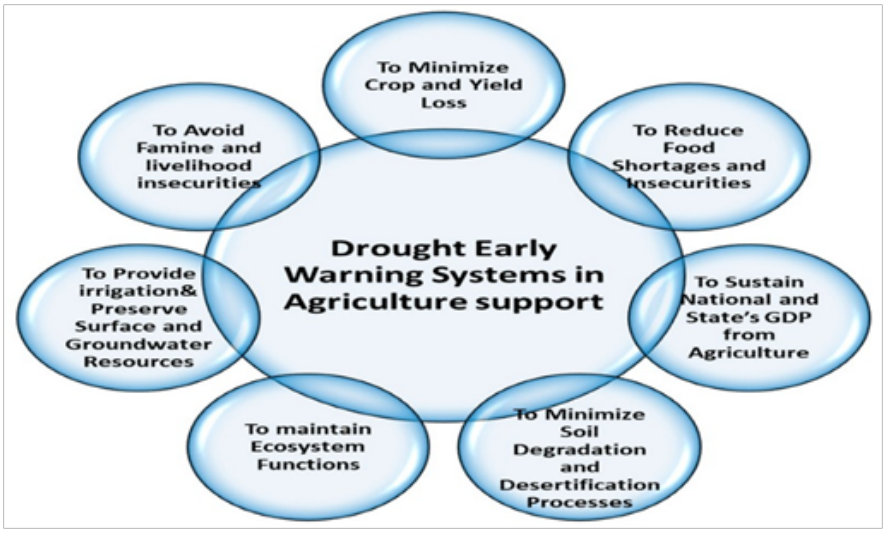
Satellites equipped with advanced sensors provide invaluable insights for disaster management:

- Rainfall Patterns: Precise data helps in forecasting weather, flood risks, and agricultural planning.
- Soil Moisture Levels: Estimating water content aids efficient irrigation and drought adaptation.
- River Monitoring: Altimetry tracks water levels, aiding flood risk assessment.
- Vegetation Health: Indices like NDVI detect crop stress and drought-affected areas.

Key Satellites and Programs

- Indian Satellites: INSAT, RISAT, and Cartosat provide critical data for monitoring weather, soil conditions, and disaster-prone areas.
- Global Initiatives: Sentinel (ESA) and Landsat (NASA) complement Indian efforts with enhanced imagery.
- Collaborations: Partnerships with FAO and WMO integrate global satellite data for improved disaster response.

Drought Management through Satellite Technology



Monitoring and Assessment

- Rainfall Anomalies: Tracking deviations in precipitation helps predict drought risks.
- Soil Moisture Mapping: Tools like SMAP provide real-time data for better water management.
- Vegetation Indices: NDVI and EVI measure crop health and guide adaptive practices.

Early Warning Systems

- Seasonal Forecasting: Long-term climatic trends aid preparedness.
- Dynamic Monitoring: Regular updates allow timely interventions.
- Community Alerts: Mobile apps and local media share warnings to empower communities.

Mitigation Strategies

- Water Resource Management: Efficient irrigation and rainwater harvesting promote sustainability
- Crop Diversification: Drought-resistant crops ensure income and food security.
- Government Schemes: Programs like PMKSY integrate satellite insights for water conservation and sustainable agriculture.

Flood Management through Satellite Technology

Flood Risk Assessment

- Rainfall Intensity Monitoring: Enables timely mitigation strategies.
- River Monitoring: Tracks water levels for early warnings.
- Floodplain Mapping: Identifies high-risk areas for targeted measures.

Early Warning Systems

- Real-Time Alerts: Satellite systems minimize risks to life and property.
- Hydrological Models: Enhance flood forecasts and responses.
- Community Preparedness: Training reduces disaster-related casualties and losses.

Mitigation Strategies

- Structural Measures: Satellite imagery aids embankment and reservoir design.
- Non-Structural Measures: Afforestation and land-use planning mitigate flood impacts.
- Relief and Recovery: Mapping supports efficient post-flood rehabilitation.

Challenges and Limitations

- Data Accessibility: Affordable and timely access is essential for stakeholders.
- Infrastructure Gaps: Building ground stations in rural areas is crucial.
- Awareness and Training: Educating farmers and officials ensures effective use of satellite insights.
- Policy Integration: Aligning satellite applications with disaster management plans is critical.

Future Directions

- Technological Advancements: Integrating AI, ML, and IoT for enhanced data analysis.
- Collaborative Platforms: Strengthening partnerships among governments, private sectors, and research institutions.
- Community-Centric Approaches: Tailoring solutions to local needs.
- Policy Support: Improving funding and regulatory frameworks.

Conclusion

Droughts and floods severely impact rural agriculture, threatening livelihoods and food security. Satellite technology provides precise data for monitoring, early warning, and risk mitigation. Despite challenges like data accessibility and infrastructure gaps, advancements in AI and IoT offer new possibilities. By integrating satellite insights with policies and fostering community-centric approaches, India can build resilience against natural disasters and ensure sustainable growth for rural populations.

5- Krishi Decision Support System (Krishi-DSS)

The Krishi Decision Support System (Krishi-DSS) is an advanced geospatial platform designed to empower Indian agriculture with data-driven solutions. Launched on August 16, 2024, by the Department of Agriculture and Farmers Welfare, Krishi-DSS represents a significant leap in integrating technology into agriculture, often referred to as the "Gati Shakti" for this sector.

Features and Objectives of Krishi-DSS

Krishi-DSS has been conceptualized as a unified platform offering real-time insights on weather patterns, soil health, crop monitoring, and more. Its objectives include:

- Data Centralization: Hosting hundreds of agricultural data layers, including satellite imagery, soil health, groundwater levels, and weather data.
- Stakeholder Empowerment: Providing policymakers, farmers, and researchers with actionable insights.
- Sustainability: Promoting sustainable agricultural practices through better crop rotation, soil conservation, and drought management.

Indigenous Platform for Informed Decision-Making

Krishi-DSS integrates data from RISAT-1A Earth Observation Satellite, MOSDAC, and BHUVAN Geoplatform (developed by ISRO) and systems like VEDAS for seamless decision-making. This integration allows stakeholders to access reliable, high-resolution geospatial data even in challenging conditions.

Key Features:

- Real-time Crop Monitoring: Tracks crop acreage, health, and residue burning.
- Drought Monitoring: Provides near-real-time data on soil moisture, water storage, and dry spells.
- Field Parcel Segmentation: Enables tailored interventions by analyzing individual field parcels.
- Soil Information: Facilitates sustainable practices through data on soil type, pH, and fertility

Applications Towards Sustainable Agriculture

- Improved Crop Management: Parcel-level analysis aids in targeted interventions, enhancing productivity.
- Disaster Preparedness: Early warnings for pests, heavy rainfall, or hailstorms mitigate risks.
- Policy Development: Evidence-based policymaking becomes possible with precise data.
- Insurance Solutions: Accurate assessment of flood and drought impacts enables fair compensation.

Bridging the Gap: Stakeholder Benefits

Krishi-DSS connects farmers, scientists, and policymakers, ensuring informed decisions at every level:

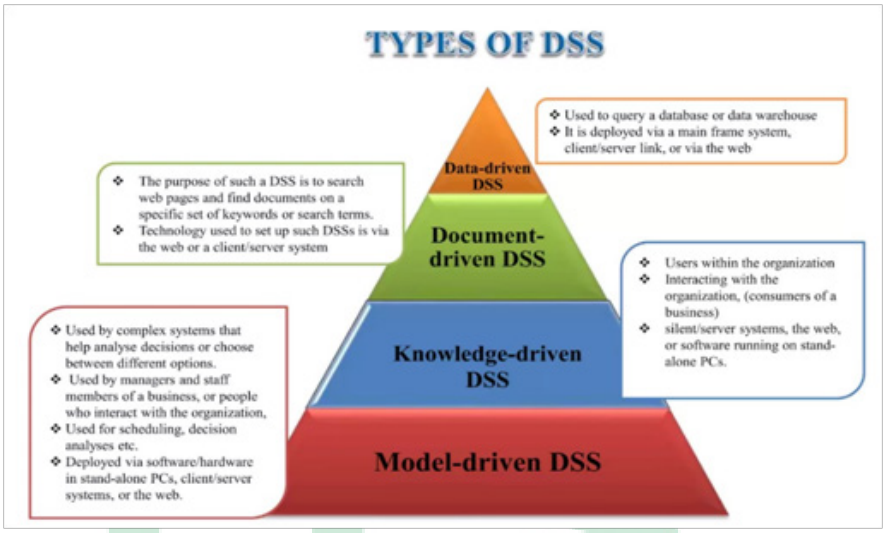
- Farmers: Receive personalized advisories for crop suitability, irrigation, and fertilizers.
- Researchers: Leverage spectral libraries and ground truth data for innovation.

- Policymakers: Use analytics for crafting region-specific agricultural policies.

Integration with the Digital Agriculture Mission

Krishi-DSS is a part of the broader Digital Agriculture Mission, launched with a financial outlay of 2,817 crores. This mission includes initiatives such as:

- Agri Stack: A digital repository aimed at revolutionizing agricultural services.
- Soil Profile Mapping: Enables precision agriculture by providing granular soil data.
- Digital Public Infrastructure (DPI): Supports IT initiatives across central and state governments.



Challenges and the Way Forward

Challenges:

- Digital Divide: Limited access to digital infrastructure in rural areas.
- Capacity Building: Lack of technical expertise among farmers and local officials.
- Data Privacy: Concerns regarding the misuse of agricultural data.

Recommendations:

- Infrastructure Development: Enhance internet connectivity in rural areas.
- Training Programs: Educate stakeholders on using digital platforms effectively.
- Policy Safeguards: Ensure robust data protection mechanisms.

Conclusion

Krishi-DSS is more than a technological innovation; it is a transformative step toward achieving sustainable and resilient agriculture in India. By integrating cutting-edge geospatial technologies with real-time data, it empowers stakeholders, enhances productivity, and promotes sustainability. As part of the Digital Agriculture Mission, Krishi-DSS holds the potential to redefine Indian agriculture, ensuring food security and rural prosperity for generations to come.